Social Media Enabled Collaborative Learning Environments: A Design Science Research Approach

Volume 1 of 2

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Declaration

The author hereby declares that, except where duly acknowledged this thesis is entirely his own work and had not been submitted for any degree in the National University of Ireland, or in any other University.

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Abstract

Collaborative technologies such as Group Decision Support Systems (GDSS) were proclaimed to be able to impact the learning environments of educational institutions twenty years ago, where the Information Systems (IS) discipline was interested in determining whether they were capable of transforming the traditional methods of teaching. It was understood that these technologies were effective at transforming learning environments from a traditional approach to a collaborative one, where the learner is part of the learning process, but little has actually changed in this time. However, new generations of these collaborative technologies often emerge, and the platforms of social media are one such technology. In a similar fashion to previous collaborative technologies, social media have been proclaimed as impacting the learning environments of educational institutions through better communication and collaboration, in new and exciting ways. However, a problem that has been identified is *there is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning.* This study helps improve this understanding.

A design science research (DSR) approach was adopted to build an evaluation framework to be able to evaluate the effectiveness of social media enabled collaborative learning environments (SMECLEs). The evaluation framework was developed during a five year DSR study, over six design cycles. These incorporated insights from existing literature on DSR, social media, and collaborative learning, using 272 journal and conference articles. Further, data was gathered from six SMECLEs, which consisted of 857 tweets, 1439 blog posts, and 3376 blog comments. The resulting framework was then used to evaluate the six SMECLEs, where a number of trends were identified, which suggests that the tool is effective for its intended purpose. Thus, the primary contribution of this study, to both practice and the knowledge base, is the evaluation framework for social media enabled collaborative learning environments (SMECLEs). The secondary contribution is an IS DSR process model for developing frameworks as an artefact, which provides the structure that can be utilised in the execution and presentation of a framework through DSR.

For John,

My brother,

My friend,

My idol.

I see a young man, pen in his hand,

He's tryin' to sum the whole show up, but he can't.

- Mick Flannery, Down the Road

Chapter 1 Introduction

1.1 Introduction

This chapter seeks to provide the context for the rest of the study. To achieve this, an overview of each chapter is presented, which contains a guide to what each one entails, and the associated findings. First, three reference guides are introduced (Section 1.2), which explains the literature review methodology used (Section 1.2.1); provides an overview of the data sets (Section 0); and a list of acronyms used throughout this study (Section 1.2.3).

1.2 Reference Guides

In the following section, a number of different items are introduced that are often referred to throughout the study, such as the case studies that were used, and a list of acronyms that are used throughout. These are used as references for the reader if they require them. The literature review methodology that was applied throughout the thesis is introduced first.

1.2.1 Literature Review Methodology

The cornerstone of a good literature review is to apply a conceptual framework that helps to focus it (Siponen and Willison, 2007). Bandara et al. (2011) offer such a framework, which has been adapted for this literature review and is presented in Table 1-1. This approach consists of five phases, where each one is executed before proceeding to the next. First, the domain of interest that the author is focused on needs to be identified, and this impacts on what sources are relevant for the author to gather literature from. As this research (at a high level) is in the area of Information Systems (IS), a selection of IS specific sources is sought whenever possible, which is a scope that has been justified in prior research (Bandara et al., 2011). These IS specific sources include the AIS senior scholars' basket of (eight) journals, which is an internationally recognised journal ranking list, used in some form in other comprehensive literature reviews such as Chen and Hirschheim (2004) and Mingers (2003). The AIS conferences: Americas Conference on Information Systems

(AMCIS - America’s number one conference on IS), and the International Conference on Information Systems (ICIS – the world’s number one conference on IS), and the affiliated AIS conference: the European Conference on Information Systems (ECIS – Europe’s number one conference in IS) were also identified as relevant sources.

However, while each of these is considered quality resources in terms of IS research, it may be argued that some other sources would have also benefited the research. For example, the Design Science Research in Information Systems and Technology (DESRIST) conference may have been another source that could have provided a greater sample of articles for DSR; A and B journals may have provided further samples of social media articles since it is still an emerging topic; and research in the learning discipline may have provided further articles in terms of collaborative learning. However, it is felt that the sources provided offered a large enough sample of articles, and without the constraint of time, it would have been possible to extend this search further.

Once the domain of interest has been stated, and the relevant sources that need to be searched are identified, the next stage involves searching these sources. First, a list of key search terms should be written up by the author, and then each source should be searched, identifying articles that contain any of the key search terms in their title, abstract, or keywords sections. This creates a pool of articles that then need a more detailed review, where the author reads the abstract and keywords to determine if the article is relevant to the domain. This creates the final pool of articles that will be reviewed. Next, the author needs to determine what is going to be captured from the pool of articles, which is critical to conduct an effective and efficient literature review (Bandara et al., 2011). Each article is then reviewed, and any time a concept is mentioned, it is added to the concept-centric matrix, and if new concepts are observed, they are added, and the previous articles are reviewed again for this new concept. When each article has been read, the concept-centric matrix is analysed, to provide an understanding of the domain that is being reviewed.

Phase	Step	Outcome
1. Selecting the Sources	Specify the domain of interest.	A specific domain.
	Identify relevant sources for selected domain.	Sources to search for articles.
2. Search Strategy	Identify key search terms.	List of key search terms to look for in articles.
	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their "title", "abstract" or "keywords" section.	A pool of articles that contains at least one of the key search terms.
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	A pool of articles to be reviewed.
3. Coding Schemes	Determine what is going to be captured from the pool of articles.	A list of concepts that must be captured.
4. Article Review	Read the articles, and capture the required data.	Concept-Centric Matrix for the selected domain.
5. Analysis and Write Up	Analyse the gathered data, and report findings.	An understanding of the concepts.

Table 1-1: Literature Review Framework

The case studies that were used for this research are presented next.

1.2.2 SMECLE Case Studies

Six social media enabled collaborative learning environments (SMECLEs) were created for this study, from January 2012 to March 2013, which consisted of three microblog enabled CLEs, and three blog enabled CLEs. Each of these were created based on the design principles (DPs) that were identified from IS literature on collaborative learning, which are presented in Table 1-2.

DP	Explanation
DP1	The instructor must give a foundational introduction to the topic that they wish the learners to discuss for the task.
DP2	The instructor must create groups, where the size must be 3-4 members.
DP3	A task must be assigned for groups to actively seek an answer to, which must not have a definitive answer, in a set time period.
DP4	Relationships must be able to form amongst the learners, and the instructor, allowing information to flow between them.
DP5	When the task is completed, groups must present their solution to the class.
DP6	The instructor then must act as the liaison between the learners and the community that they wish to join by saying whether the solutions are acceptable to the community.

Table 1-2: Design Principles of Collaborative Learning Environments

A SMECLE can be created by following these DPs, and choosing any of the six social media platforms (SMPs) that have been highlighted in the social media literature review, to enable it: social networking sites; virtual worlds; collaborative projects; microblogs; blogs; and content communities (see Chapter 4, section 4.2.1). As mentioned above, this research focused on gathering data from two types of SMECLEs: microblog enabled collaborative learning environments, and blog enabled collaborative learning environments, and the steps for creating these environments are presented in Table 1-3, where the DPs from Table 1-2 are applied.

Step	Explanation
1.	The instructor must choose an SMP to use.
2.	The instructor must create the rules for the SMECLE.
3.	The instructor must set up their own account on the SMP.
4.	The instructor must create the groups of 3-4 learners in accordance with the amount of learners in their class.
5.	The instructor must set an open-ended task.
6.	Learners must create their accounts on the SMP.
7.	Learners must connect with every other learner, including the instructor, in the way the SMP allows.
8.	The instructor reviews the answers provided, saying whether the solutions are acceptable for the community.

Table 1-3: Steps for Creating the SMECLEs

The two types of SMECLE were created, and run, with different classes, based on the steps in Table 1-3. An overview of the microblog enabled CLEs are introduced in the following section, followed by the blog enabled CLEs.

1.2.2.1 Microblog Enabled CLEs

Microblogs are a type of SMP that allow users to create profiles and make posts about their activities, opinions, and status; these posts have a character limit on them between 140-200 characters. Users can connect with other users, which is not reciprocal, and it allows them to see posts from the users they connect with. In terms of a CLE, microblogs can be used to create groups of learners to be able to interact with each other, and also with the wider audience of anyone else who is using the particular microblogging service. Learners can interact by creating specific tags for their group to use, or by mentioning each other's usernames in their messages. In terms of the types of tasks that can be completed, with the platforms character limit, it is best to require short answers. For example, in a microblog enabled CLE, asking learners to define topics would be more appropriate than asking them to create an essay type answer due to a maximum of 140 characters per post. Three microblog enabled CLEs were created for three different classes, where the platform was adopted around the design principles for creating a CLE, which are presented in Table 1-4.

Step	Explanation
1.	The instructor chose microblogs as the SMP to be used, with Twitter as the specific service.
2.	The instructor created the following rules: all learners must participate; all learners must create new Twitter accounts with the set naming conventions; all learners must be signed in to their account at the time the class starts.
3.	The instructor set up their Twitter handle.
4.	The instructor created the groups of 3-4 learners in accordance with the amount of learners in their class.
5.	The instructor set the task and tweeted it at the start of the class.
6.	Learners created new Twitter accounts with set naming conventions, i.e. CourseInitialsStudentnumber - ISBP104468261.
7.	Learners connected with every other learner by *"Following"* their accounts, including the instructor.
8.	The instructor reviewed the answers that were given, and provided feedback to the learners.

Table 1-4: Steps for Creating Microblog Enabled CLEs

An overview of the three microblog enabled CLEs is presented in Table 1-5. There is a variance amongst each of the classes, from the module level, to the module objectives, to the amount of learners in each environment.

	IS6119	IS3101	IS4428
Module Title	*IT Organisation: Insourcing and Outsourcing*	*Health Information Systems and e-Health*	*Web Development for Business*
Date	17th January 2012	31st October 2012	12th March 2012
No. of Learners	28	7	24
No. of Groups	Eight	Two	8
Class Length	2 Hours	1.5 Hours	1 Hour
Module Level	Masters of Business Studies	3rd year undergraduates	4th year undergraduates
Module Objective	Provide students with an understanding of the role of the IS/IT function in a modern organisation and approaches to sourcing IS/IT solutions	Introduce students to healthcare information systems and leading edge e-Health applications	Provide students with an understanding of how to develop and manage web based applications for business environments
Task	*#task* is to define as many approaches to IS/IT *#outsourcing* as you can, specify the *#uniqueness* of each approach	*Is the internet a good place for patients to source information about their health conditions based on a specific condition?*	*The **#task** is to define what is meant by website **#navigation**, **#testing**, and **#SEO***
No. of Tweets	421	137	299

Table 1-5: Overview of the three Microblog Enabled CLEs

An overview of the blog enabled CLEs is presented next.

1.2.2.2 Blog Enabled CLEs

Blogs are a type of social media platform that allow users to create a profile, and create posts that are displayed as date-stamped entries in reverse chronological order, and allow other users to comment on the posts. Users do not have to connect with other users, but instead can click on topics that interest them to see blog posts, click on specific users to see their blog posts, or search for blog posts. In terms of a CLE, blogs can be used to allow groups of learners to interact with each other, and also with the wider audience of people with access to the blog uniform resource identifier (URL). Learners interact by writing blog posts, and commenting on other learner's blog posts. In terms of the types of tasks that can be completed, there is no set limit on the amount of characters that can be used to create a blog post, so requiring learners to just define concepts may be limiting to what can be achieved. For example, asking learners to write blog posts on a specific topic within a given area, i.e. the role of a systems analyst for a module titled *"Systems Analysis and Design"* would seem more appropriate to the platform. Three blog enabled CLEs were created for three different classes, where the platform was adopted around the design principles for creating a CLE, which are presented in Table 1-6.

Step	Explanation
1.	The instructor chose blogs as the SMP to be used, with WordPress as the specific service.
2.	The instructor created the following rules: all learners must participate; all learners must create new WordPress accounts with the set naming conventions; all learners must post at least one blog each week for a six week period; all learners must write their blog posts on their assigned topic; learners must categorise their post to their assigned topic; all learners must read and comment on other learners blogs.
3.	The instructor set up their blog handle.
4.	The instructor created the groups of 3-4 learners in accordance with the amount of learners in their class.
5.	The instructor set the task, and posted it to the blog.
6.	Learners created new WordPress accounts with the set naming conventions, i.e. ModuleAcronymStudentNumber - sad104468261.
7.	Users were not required to connect as they can view the posts for different topics, click on specific users, or search for specific topics or users.
8.	The instructor reviewed the answers that were given, and provided feedback to the learners.

Table 1-6: Steps for Creating the IS2200 Blog Enabled CLE

An overview of the three blog enabled CLEs is presented in Table 1-7, where a variance amongst each of the classes can be observed.

	IS2200	IS6118	IS1100
Module Title	*Business Systems Analysis and Design*	*Business Continuity and IT Value*	*Introduction to Business Information Systems*
Date	22nd January – 1st March 2013	22nd October – 29th November 2012	4th February – 29th March 2013
No. of Learners	153	52	77
No. of Groups	45	14	23
Class Length	6 Weeks	6 Weeks	7
Module Level	2nd year undergraduates	Masters of Business Studies	1st year undergraduates
Module Objective	Provide an introduction to systems analysis and design	Provide students with an understanding of the issues concerned ensuring business value and continuity of the service offered to the firm by information systems	Provide an introduction to systems analysis and design
Task	*Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.*	*Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.*	*Each group is assigned a topic, and for seven weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.*
No. of Blog Posts	809	323	307
No. of Blog Comments	1623	721	1032

Table 1-7: Overview of the three Blog Enabled CLE

With each of the SMECLEs introduced, a table of acronyms for the study is introduced in the next section.

1.2.3 List of Acronyms

There are many acronyms used throughout the study, so Table 1-8 provides a reference guide for each one

Acronyms	
CLE	Collaborative Learning Environment(s)
DPs	Design Principles
DSR	Design Science Research
SMP	Social Media Platforms
SNS	Social Networking Site
URL	Uniform Resource Identifier
VW	Virtual World
SMECLE	Social Media Enabled Collaborative Learning Environment(s)

Table 1-8: List of Chapter Acronyms

The reference guide can be referred to at any time throughout the study when necessary. The following sections provide an overview of each chapter, acting as a mini-guide to the whole study. This begins with understanding what design science research is to this study, introduced in the next section.

1.3 What is Design Science Research?

There has been an increasing interest in design science research (DSR), which is a research paradigm that looks to achieve relevance to practice by providing new innovative artefacts that address heretofore unsolved problems or address them more effectively/efficiently than previous attempts, in a rigorous manner. There are still disagreements within the paradigm, and presented in Table 1-9 are questions that often get asked, and the answers that apply for this study.

Question	Understanding for this Study
What constitutes IS design science research?	The understanding of what constitutes DSR is drawn from Hevner et al. (2004), and Hevner (2007). That is to say, DSR consists of identifying a relevant problem in practice, and then looking to the scientific knowledge base to develop the grounding of the research. Some form of an artefact must then be designed, and built to solve the identified problem, and this is measured by evaluating it for its usefulness. The contributions to both practice and the knowledge base must then be explained.
What constitutes a design science research artefact?	The understanding of what constitutes a DSR artefact is that it can be a construct, model, method, and/or an instantiation. That is to say, there are no set parameters on what kind of artefact must be built, and in what order, for it to be considered an outcome of DSR. A study may only produce one of these four artefacts, or produce a variation of the four, but so long as they are useful, and solve a real world problem, they are considered DSR artefacts.
What constitutes a design science research contribution?	The understanding of what constitutes a DSR contribution is that the major contributions will be in the form of the artefact(s) that are built. That is to say, depending on the problem that is identified to be solved, an understanding of what kind of artefact(s) that will best solve this problem will need to be designed, built, and evaluated for its usefulness. This will lead to contributions that can be an improvement, invention, or exaptation, depending on domain, and the artefact that is built. From these actions, there will be contributions to practice in terms of the artefact(s) helping to solve a problem, and also to the knowledge base, who can further research, or extend such an artefact(s).
What constitutes theory in IS design science research?	The understanding of what constitutes theory in DSR is that the paradigm is still unsure if theory is actually necessary to be considered DSR, but kernel theories can be used to inform the research (Kuechler and Vaishnavi, 2008), as well as other sources such as the knowledge base. The knowledge that is created through conducting DSR can be considered theory building, especially if it is building artefacts such as constructs, models, and/or methods, as these are all components of theory, and this can be referred to as nascent design theory (Gregor and Hevner, 2013), which is what this study will be doing.

Table 1-9: Understanding of Design Science Research for this Study

There is also another question that has often been raised in the DSR community, and that is *"What is a commonly accepted process model for design science?"* While there have been numerous attempts at providing such a model, this study built an IS DSR process model by comparing and contrasting the different models that have appeared in the IS literature. From this cross comparison of DSR process models, six process elements were identified, and these are explained in Table 1-10. Further to this, while Hevner et al. (2004) offer seven guidelines to use when conducting DSR, they do not require a sequenced application. These seven guidelines are used to help guide each of the process elements, and have been mapped appropriately to the element that they can best guide, also shown in Table 1-10.

Activity	Explanation	Guideline
1. Problem Identification	Identifying a problem involves recognizing a deficiency in a current system and then justifying the value of finding a solution to this problem.	G2: Problem Relevance
2. Objective(s) of a Solution	Stating the objective(s) for the research is necessary to provide focus, and should be inferred from the problem definition.	
3. Design and Build	Designing and building an artefact involves moving from the research objectives and actually demonstrating that it is feasible to build such an artefact.	G1: Design as an Artefact G5: Research Rigor G6: Design as a Search Process
4. Evaluate	Once an artefact has been built, the researcher must evaluate its utility by comparing the objectives of the solution to actual observed results from the use of the artefact in its intended environment.	G3: Design Evaluation
5. Justify Contributions	Justifying the contributions of the research is achieved by showing the artefact being utilised in the practical environment in which it was developed for, as well as stating the contributions that are made to the knowledge base.	G4: Research Contributions
6. Communicate	It is necessary to communicate the resulting knowledge from the research to both practice and academia.	G7: Communication of Research

Table 1-10: Activities and Guidelines of an IS Design Science Research Process Model

This IS DSR process model was used to guide the research in this study. Each process element was implemented, and each guideline was followed, to ensure exemplar DSR. Figure 1-1 represents each of the process elements that were implemented, the guideline that was followed, and the order in which they took place, including the amount of design cycles that were executed.

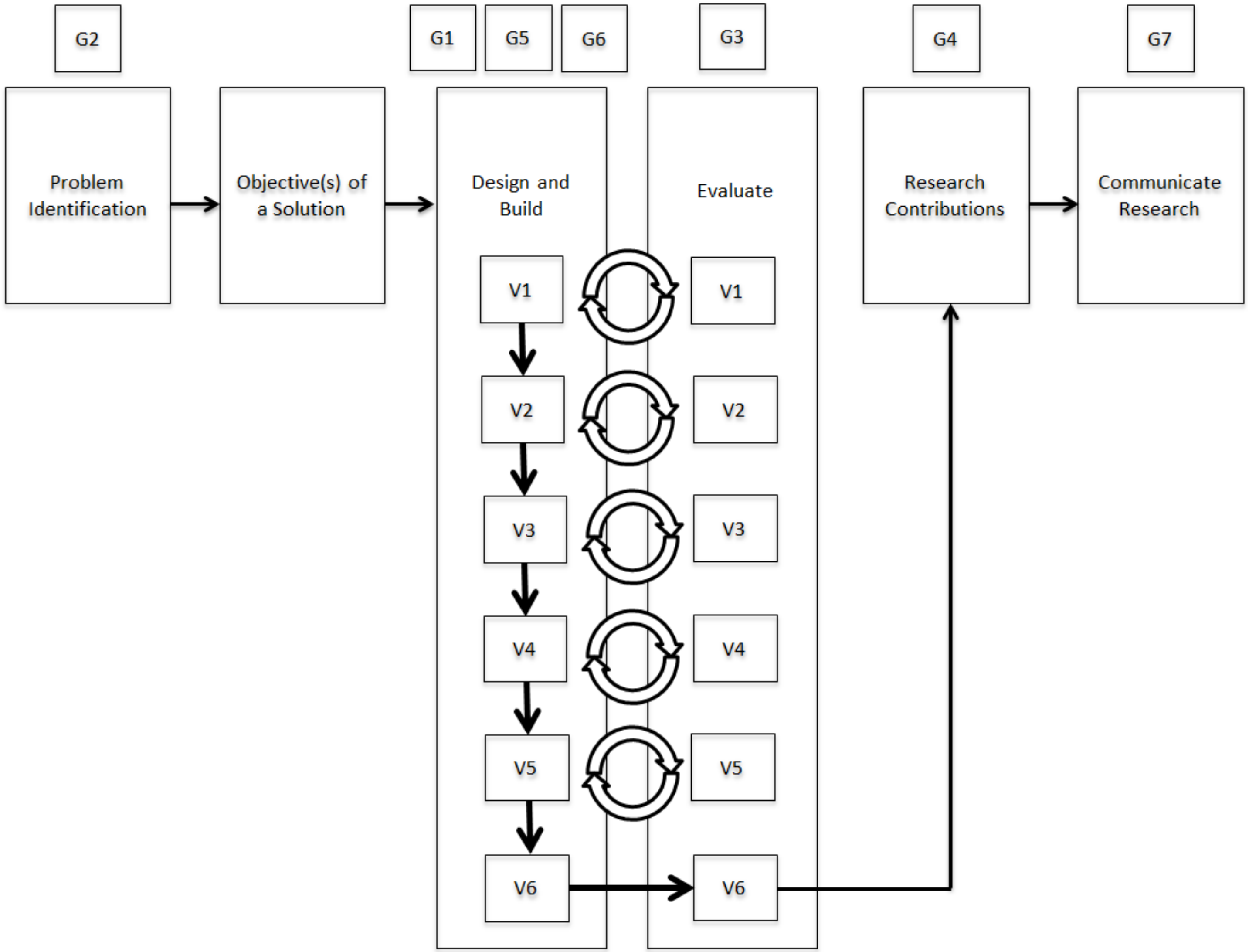

Figure 1-1: The IS Design Science Research Process Model Used for this Study

1.4 Problem Identification

Identifying a relevant problem to practice involves recognising a deficiency in a current system and then justifying the value of finding a solution to this problem (Hevner et al., 2004; Hevner, 2007). Ideally, the research problem should be new, creative, and the solution should be important to the field (Hevner et al., 2004; Hevner, 2007). Once the problem has been identified, a thorough search of previous research on the topic should be performed (Hevner et al., 2004; Hevner, 2007). By clearly defining the research problem, a focus for the research is created (Hevner et al., 2004; Hevner, 2007; Peffers et al., 2007).

The relevance of IS research to practice is an old problem in the field (Benbasat and Zmud, 1999; Davenport and Markus, 1999; Agarwal and Lucas Jr, 2005; Straub and Ang, 2008; Gill and Bhattacherjee, 2009), and has many calls for research to become more relevant, so that practitioners can benefit from it (Davenport and Markus, 1999; Klein and Rowe, 2008; Gill and Bhattacherjee, 2009). To achieve this, IS researchers should look to practice to identify a topic to research, and then look at the academic literature available to understand it (Benbasat and Zmud, 1999). It was observed that the topic of social media was receiving constant attention in practitioner literature (Armano, 2009b; Armano, 2009a; Baker, 2009; Deragon, 2009; Reid, 2009; Soat, 2010), and therefore deemed a relevant topic. However, on its own, social media is too broad as a topic, so, as is necessary with DSR, a relevant problem was identified, which helps focus the research on an area that practitioners can benefit from.

Collaborative technologies such as GDSS were proclaimed to be able to impact the learning environments of educational institutions twenty years ago, where the IS discipline was interested in determining whether these new collaborative technologies were capable of transforming the traditional methods of teaching (Leidner and Jarvenpaa, 1993; Alavi, 1994; Alavi et al., 1995; Leidner and Jarvenpaa, 1995). Reasons for this interest included educational institutions lack of change in their learning environments, especially in comparison to organisations adoption of such technologies (Alavi et al., 1995; Leidner and Jarvenpaa, 1995); lack of engaging students in the learning process (Alavi, 1994); educators, students, and employers feeling that technology could enhance learning (Alavi, 1994); and despite

IS researchers highlighting *"the merits of information technology to improve communication, efficiency, and decision making in organizations"* (Leidner and Jarvenpaa, 1995, p.265), they were not applying this knowledge to their own learning environments.

New generations of these collaborative technologies often emerge (Bajwa et al., 2008), and the platforms of social media are one such technology. In a similar fashion to previous collaborative technologies, social media have been proclaimed as impacting the learning environments of educational institutions through better communication and collaboration, in new and exciting ways (Ajjan and Hartshorne, 2008; Kane and Fichman, 2009; Zhang, 2012). However, just like before, the same issues can be observed: the learning environments of educational institutions have seen little change in the past 20 years, especially in comparison to organisations adoption of such technologies, where there is still a lack of engaging students in the learning process, relying on the traditional method of teaching (Kane and Fichman, 2009; Zhang, 2012; Hustad and Olsen, 2014); educators, students, and employers, believe that technology enabled learning environments will enhance learning (Chen et al., 2008; Tan et al., 2011); the IS discipline has also focused much research on social media in terms of their impact on organisations, but have failed to discuss it in terms of how this knowledge could influence their own practice, especially in terms of learning (Kane and Fichman, 2009).

However, while there are calls for social media to be introduced to learning environments, introducing them is not such a simple task, and should not be done just for the sake of it (Kane and Fichman, 2009), but educators need to consider the learning models that best suit the platforms to enable learning to occur (Alavi, 1994; Leidner and Jarvenpaa, 1995; Chen et al., 2008). Alavi (1994) suggests that actively engaging learners in the learning process is preferred to the traditional method of teaching, where it generates more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners (Leidner and Jarvenpaa, 1995; Zhang, 2012; Hustad and Olsen, 2014). So it is argued that it is necessary to reengineer the current traditional approach of learning, to a collaborative learning approach (Kirschner, 2001) as a collaborative technology may be better suited to enabling such a learning environment (Alavi, 1994; Leidner and Jarvenpaa, 1995; Kane and Fichman, 2009; Zhang, 2012; Hustad and Olsen, 2014).

Therefore we are seeing the same occurrence today as twenty years ago, where a collaborative technology is being proclaimed to be able to impact the learning environments of educational institutions, by changing, and possibly improving, the pedagogical approach. The impact again comes in the form of changing from a traditional learning approach, to a collaborative learning approach. However, the problem that has been identified is:

> *There is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning.*

This provides an opportunity for research to be conducted to provide such an understanding, which will benefit practice, in particular educational institutions, and educators.

It is important for educational institutions and educators to understand how to utilise social media in a manner that benefits their learners, otherwise there is the potential to fail to learn from the past, where technology was used to merely aid traditional learning environments as opposed to impact and change them, which resulted in little improvements except helping to speed up ineffective processes and methods of teaching (Leidner and Jarvenpaa, 1995). By understanding if the platforms of social media are effective at enabling collaborative learning environments, both educational institutions, and educators, will be able to make an informed decision on whether or not the adoption of social media is beneficial to their learners. Further to this, by being able to evaluate their own collaborative learning environments, educators would also be able to understand where they can improve aspects of them, to increase the benefit to learners.

From the literature review that was conducted, it was evident that there were numerous studies that focused on different platforms of social media and their impact on learning (Schultze et al., 2007; Franceschi et al., 2009; Phang and Kankanhalli, 2009; Chen et al., 2010; Kumar, 2012; Lattemann and Stieglitz, 2012; Zhang, 2012); however none of them focused on collaborative learning. A further issue with each of these studies is that while they do provide important findings for instructors in relation to adopting social media into different types of learning environments, they are each specific to the study that has been set up. That is to say, no framework has been built in these studies to allow educators to evaluate the effectiveness of the learning environments that they build, but instead are reflective only of the ones in the studies. This provides an opportunity for such a framework to be developed, which allows educators to evaluate the effectiveness of the collaborative learning environments they design and build.

1.4.1 Objective of a Solution

Stating the objective(s) for the research is necessary to provide focus. The objective(s) should be inferred from the problem definition, while also stating what is possible and feasible. This objective(s) will eventually act as the metric at the evaluation stage, when the artefact will be judged to have achieved its intended goal of solving the identified problem. When stating the objective(s), they can be in quantitative terms (where a desirable solution would be better than current ones), or qualitative (description of how a new artefact is expected to support solutions to problems not hitherto addressed) (Peffers et al., 2007). While a relevant problem that needs to be addressed has been identified above, the objective that was inferred from this is:

> *Evaluate the effectiveness of social media enabled collaborative learning environments.*

This is a quantitative measure, which will be used as the metric at the evaluation stages of the design process, to see if the artefact that is designed and built has achieved its intended goal. The research questions that will help to achieve this objective are presented and explained in Table 1-11.

Research Questions	Explanation
RQ1: *What are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?*	Firstly, to be able to evaluate the effectiveness of SMECLEs, an evaluation framework is needed, which is currently lacking in the literature. This would help to understand if social media platforms are effective at enabling collaborative learning environments. To be able to build such san evaluation framework through DSR, it is necessary to iterate through design cycles, until no further improvements can be made.
RQ2: *What are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?*	Secondly, by evaluating the SMECLEs with the new evaluation framework, trends can be identified across them, helping to understanding how effective these SMECLEs are.

Table 1-11: Explanation of Research Questions in this Study

The next section explains the design, build, and evaluate cycles that occurred, which answers the first research question.

1.5 Designing, Building and Evaluating the SMECLE Evaluation Framework

The research question that was addressed in this chapter was w*hat are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?* To answer this, the next stage in the IS DSR process model, presented in Table 1-10, was followed, which initially consists of designing and building an artefact. This involves moving from the research objective and actually demonstrating that it is feasible to build the identified artefact. The design involves understanding the studied domain, and applying relevant scientific and technical knowledge, while the build refers to the construction of the artefact (constructs, models, methods, and instantiations) based on this knowledge, demonstrating such an artefact can be constructed.

For this study, three building blocks to build the evaluation framework were identified as being necessary: **social media platform**, s**ocial media characteristics,** and **collaborative learning characteristics**. To understand each of these building blocks, a review of the IS literature was undertaken, where six social media platforms were identified and explained, as well as five social media characteristics, and five collaborative learning characteristics. When this was completed, SMECLE evaluation framework V1.0 was built by putting these building blocks together, where a matrix that juxtaposes the five characteristics of social media against the five characteristics of collaborative learning, created, on a single page, an evaluation framework to analyse if the social media platform is enabling collaborative learning to occur. Further to this, the matrix created twenty-five relationships that required different rules to act as indicators to whether an instance of an intersection between two characteristics had occurred, and these were created based on the understanding of how a social media characteristic may enable a collaborative learning characteristic. SMECLE Framework V1.0 is presented in Figure 1-2, where the building blocks, and cell rules can be seen.

				Task				
				Collaborative Learning Characteristics				
				Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
				Learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task.	**Groups of 3-4 learners asking questions, justifying opinions, listening to others, and through negotiation, reaching a consensual answer.**	**The instructor provides a task to be completed, and offers qualified guidance when required.**	**Diversity in a group (because of learner's background), allows learners to draw different perspectives on task-related information.**	**Relationships are expanded from instructor-to-learner, to include learner-to-learner, and learner-to-instructor relationships, where learning is multidirectional.**
Social Media Platform	**Social Media Characteristics**	Social Interaction	**Communications between users, which can occur multi-directionally.**	A learner makes a comment.	A learner makes a comment, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor makes a comment.	A learner makes a comment, drawing on their diversity.	A relationship is formed/strengthened based on a comment.
		Social Collaboration	**Users interacting to generate, edit, and share content, out of necessity.**	A learner asks another learner(s) a question. or A learner agrees/disagrees with another learner(s).	A learner asks another learner(s) a question(s), and they acknowledge it, and a consensual answer is reached. or A learner agrees/disagrees with another learner (s), and they acknowledge it, and a consensual answer is reached.	The instructor asks a learner(s) a question. or The instructor agrees/disagrees with a learner(s).	A learner asks another learner(s) a question, drawing on their diversity. or A learner agrees/disagrees with another learner(s), drawing on their diversity.	A relationship is formed/strengthened from asking questions or A relationship is formed/strengthened from agreeing/disagreeing with the content.
		Content Sharing	**Users sharing content (text, video, links, etc.) that other users can consume, and share.**	A learner shares content (text, video, image, or link).	A learner shares content (text, video, image, or link), and at least one group member acknowledges it, and a consensual answer is reached.	The instructor shares content (text, video, image, or link).	A learner shares content (text, video, image, or link), drawing on their diversity.	A relationship is formed/strengthened based on the sharing of content.
		User Generated Content	**A user creating original content, or building on previously existing content.**	A learner creates, and shares some original content.	A learner creates, and shares some original content, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor creates, and shares some original content.	A learner creates, and shares some original content, drawing on their diversity.	A relationship is formed/strengthened based on creation and sharing of some original content.
		Social Connectedness	**Represents the number and quality of connections a user has in their social circle.**	A connection is created/strengthened as learners actively learn together.	A connection is created/strengthened as learners communicate with each other.	A connection is created/strengthened as an instructor communicates with a learner.	A connection is created/strengthened as learners communicate, drawing on their diversity.	A connection is created/strengthened as user's relationships are strengthened.

Figure 1-2: SMECLE Evaluation Framework V1.0 with Rules

Once an artefact has been built, the researcher must evaluate its utility by comparing the objectives of the solution from *"Activity 2: Objective(s) of a Solution"* presented in Section 1.4.1, to actual observed results from the use of the artefact in its intended environment. These objectives therefore act as the metrics, which define whether the artefact has achieved its intended goal of solving its identified problem, or not. This evaluation can be done in many ways, such as experiments, observations, or field studies, and is dependent on the problem environment and the artefact itself. It is also an iterative step, where the researchers can decide to take the lessons learned in the *evaluation* activity and return to the *design and develop* activity to improve the artefact. Alternatively, they can move onto the next activity and leave further improvements for future research. Crucially, if the metrics used to measure the artefact are weak, or there is a failure to measure the artefact's performance with these metrics, there is great difficulty in judging research contributions. Together, these three elements make up the design cycle.

For this study, two-step evaluation was used. The first step involved the researcher evaluating the framework for its usefulness. This was done by analysing a data set(s) with the framework, identifying where cell rules, and/or cell structures, were demonstrated to be effective, and ineffective. The second step involved a two hour evaluation session with two senior educators. This was done by discussing the effective, and ineffective, cell rules, and/or cell structures, that were identified in the first step, and why they were determined to be so. From this, recommendations on what changes should be made to the framework were suggested, and used in the next design, and build phase. For example, after the evaluation framework was built, it was evaluated by using it to analyse the data from the first SMECLE case study that was run, IS6119. This involved the researcher reading the data that was created in that learning environment, and determining if it met any of the rules in the evaluation framework. It was observed however, that a few of the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. These observations were then discussed in a two hour evaluation session with two senior educators, where the effective, and ineffective, cell rules were discussed, and how they could be improved. This indicated that the objective had not been met, as the evaluation framework was not capable at evaluating the effectiveness of the SMECLE. The learning from this evaluation was then brought into the next design and build activity so the evaluation framework could be improved.

The evaluation framework's building blocks were demonstrated to be effective for building a SMECLE evaluation framework, so the other design phases were different to the one explained above, and can be seen in Table 1-12, which also presents the build and evaluate phases of the design cycles.

Phase	Explanation
Design	The design phases for this study took two forms. Initially, to explain the building blocks of the evaluation framework, a literature review was conducted, which applied the literature review methodology explained in section 1.2.1. From this literature review, six types of SMPs were identified and explained, as well as the characteristics of social media, and the characteristics of collaborative learning. After this, each design phase consisted of taking the learnings from the previous evaluation phase, and implementing them into the design of the evaluation framework.
Build	Each of the build phases consisted of taking the new design learnings, and applying them to the framework. This consisted of either amending the cell rules that were demonstrated to be ineffective or making structural changes to framework cells when required.
Evaluate	The evaluation phases for this research consisted of two-step evaluation. The first step involved the researcher analysing the case studies that were introduced in section 0, with the different versions of the evaluation framework that were designed and built, for their usefulness at evaluating SMECLEs. The second step involved a two-hour evaluation session, which occurred after every first step, with two senior educators. A discussion occurred about the effective, and ineffective, cell rules, and/or cell structures, that were identified in the first step, and why they were determined to be so. From this, recommendations on what changes should be made to the framework were suggested, and used in the next design, and build phase.

Table 1-12: Design Cycles for this study

There were six design cycles in this study, which are represented in Table 1-13, which illustrates each version of the evaluation framework, and the data set that was used to evaluate it. For example, for SMECLE evaluation framework V1.0, there was only a single data set used to evaluate it, as a number of rules were determined to be incompatible with the IS6119 data set, and thus not useful at evaluating SMECLEs. For V2, after another design and build phase, where the rules were amended, another data set was used to evaluate it (it was not necessary to evaluate IS6119 again as the rules would satisfy that now, represented by the red Y). However, the new data set, IS3101 identified a number of rules to be ineffective. This process continued until no more rule needed to be amended, or cell structures needed to be changed.

Social Media Platform	Data Set	V1	V2	V3	V4	V5	V6
Microblog	IS6119	X	Y	X	X	X	Y
	IS3101		X	Y	X	X	X
	IS4428			X	X	X	X
Blog	IS2200			X	Y	X	X
	IS6118				X	Y	X
	IS1100					X	X

Table 1-13: The Design Cycles for the Research, with the data sets used to evaluate each version of the SMECLE Evaluation Framework

All six of the SMECLE data sets were analysed with SMECLE evaluation framework 6.0, but no rule changes, or cell structure changes were identified as being necessary. The completed SMECLE evaluation framework is presented in Figure 1-3, and the rules for these cells are presented in Section 1.7.1.2 as a contribution of this study.

			Task																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Social Media Platform	**Social Media Characteristics**	Social Interaction																		
		Social Collaboration																		
		Content Sharing																		
		User Generated Content																		
		Social Connectedness																		

I = Individual
AG = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Figure 1-3: SMECLE Evaluation Framework

The completed SMECLE evaluation framework was then used to evaluate the six cases, and the findings from this analysis are introduced in the next section.

1.6 Evaluation of Microblog enabled CLEs and Blog Enabled CLEs

This chapter evaluated the three microblog enabled CLEs that were introduced in section 0, namely IS6119, IS3101, and IS4428, with the SMECLE evaluation framework, and following this it evaluated the three blog enabled CLEs that were introduced in section 0, namely IS2200, IS6118, and IS1100. The question it helped to address was w*hat are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?* Three types of trends are identified: *task based trends*, *characteristic based trends*, and *cell based trends*. *Task based trends* refer to the trends that were observed in the learning environments relating to how learners attempted to solve the task. *Characteristic based trends* are the trends that were observed in the learning environment relating to each of the collaborative learning characteristics. Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. The trends that were observed across the microblog enabled CLEs are the first to be introduced.

1.6.1 Cross Comparison of the Microblog Enabled CLEs

Presented in Figure 1-4 is an overview of the instances that were observed across the three microblog enabled CLEs, where three types of trends are identified: *task based trends*, *characteristic based trends*, and *cell based trends*. Each of these is presented in the following sections, beginning with the *task based trends*.

			Task																
			Collaborative Learning Characteristics																
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Microblog	Social Media Characteristics	Social Interaction	IS6119	59	18	1		2			3	3							3	26	
			IS3101	16	14			1			2									13	2
			IS4428	33	30			2			10									29	
		Social Collaboration	IS6119	28	16			4												20	
			IS3101	10	15			6												14	
			IS4428	4	6		1	2		1										7	
		Content Sharing	IS6119	124	6			1												8	
			IS3101	24	2															3	
			IS4428	105	6	2		2												11	
		User Generated Content	IS6119	23	4	1							1							8	
			IS3101	7	15			2				3	1							9	
			IS4428	9	7		1	1					1							5	
		Social Connectedness	IS6119																		
			IS3101																		
			IS4428																		

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DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure 1-4: Cross Case Comparison of Microblog enabled Collaborative Learning Environment

1.6.1.1 Task Based Trend: Task Draws Similarities and Differences

The task for IS6119 and IS4428 were similar, where the assigned groups were required to define different concepts for a given topic, the difference being that IS6119 could decide what topics to focus on, but IS4428 were given the exact topics to focus on. IS3101 had a different task, where the assigned groups had to answer a specific question, which encouraged them to discuss their answer. The majority of groups across all three of the environments provided answers to their respective tasks, however, how they got to these answers varied depending on the task that was set, as shown in Table 1-14.

1.	IS6119 learners took a cooperative approach to completing the task, where the majority of the groups divided the task up between the members, where each one would take a topic, and they were responsible for defining that topic.
2.	IS4428 took two approaches to answering their task, with the majority of groups naming one of the topics they needed to define, and then sharing as much content that related to that topic as possible, with few questions, or agreement/disagreement occurring amongst group members. One group took the same cooperative approach as was observed in IS6119.
3.	IS3101 took a collaborative approach to answering the task, where they discussed possible answers to their question, evidenced by the discussions that occurred in their environment.

Table 1-14: Task Based Trends in the Microblog enabled CLEs

Presented next are the *characteristic based trends* that were observed across the microblog enabled CLEs.

1.6.1.2 Characteristic Based Trend: Learner-to-Learner Relationships

It is expected in a CLE that the majority of relationships that get formed or strengthened would be learner-to-learner, as it should be learners interacting with each other, and only receiving guidance when required from the instructor. As shown in Figure 1-4, four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships* to be formed or strengthened across each of the three SMECLEs. It was also observed that there was at least one instance at each level although these did not occur for each characteristic, or in each learning environment. There were two trends observed across the three environments, shown in Table 1-15.

1. Four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships* across all three of the SMECLEs.
2. Across the three SMECLEs, the majority of instances occurred at the learner-to-learner level, which is expected in a CLE.

Table 1-15: Characteristic Based Trends in the Microblog enabled CLEs

Presented next are the cell based trends that were observed across the microblog enabled CLEs.

1.6.1.3 Cell Based Trend: "Content Sharing, Active Learning" was an Individual Experience

Across all three of the environments, *"Content Sharing, Active Learning"* had the highest count of instances, as shown in Figure 1-4. This could be due to microblog's ability to allow content to be easily shared amongst its users, achieved by sharing links to different types of content such as videos, PDFs, websites, and images, or by sharing text based content, all of which were observed across the three environments. There were three trends observed across the environments, shown in Table 1-16.

1. While learners did share content across each of the SMECLEs, it was mainly only beneficial to the individual who consumed and shared it, as other learners rarely acknowledged it.
2. The majority of the type of content being shared across the three SMECLEs consisted of text, where learners provided information on the topics they were discussing, either from a source, or else providing information that was already known on the topic in the community.
3. Learners shared content but they often failed to explain why, meaning it was not evident if *Active Learning* occurred or not.

Table 1-16: Cell Based Trends in the Microblog enabled CLEs

Following this over of the trends that were observed across the three microblog enabled CLEs, the trends that were observed across the blog enabled CLEs is presented next.

1.6.2 Cross Comparison of Blog Enabled CLEs

Presented in Figure 1-5 is an overview of the instances that were observed across the three blog enabled CLEs, where three types of trends are identified: *task based trends*, *characteristic based trends*, and *cell based trends*. Each of these is presented in the following sections, beginning with the *task based trends*.

			Task																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Blog	Social Media Characteristics: Social Interaction	IS2200	235	13	56			1		3	11			3		1		9	64	2
		IS6118	57	5	25	2		3						1		2			28	
		IS1100	125	5	37			1						1					45	
	Social Collaboration	IS2200	56	17	52		3	10		1								1	67	
		IS6118	99	13	113	1	1	38											120	
		IS1100	53		46			13											48	
	Content Sharing	IS2200	846	73	294		25	64	1										377	
		IS6118	422	62	206	1		14											189	
		IS1100	141	37	192			1											251	
	User Generated Content	IS2200	64	7	27					3		4		1					14	
		IS6118	110	21	100	1		3						1	1	2			87	
		IS1100	75	6	51			6				4		2		2			50	
	Social Connectedness	IS2200																		
		IS6118																		
		IS1100																		

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L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure 1-5: Cross Case Comparison of Blog enabled Collaborative Learning Environments

1.6.2.1 Task Based Trend:

All three of the SMECLE environments had the same task to complete, where assigned groups were given topics that each learner had to blog about each week, with the only difference being the topics that were assigned. The majority of groups across the three environments provided answers to the task, where there were a few approaches to solving the task observed across them, as shown in Table 1-17.

1. The majority of IS2200, IS6118, and IS1100 assigned groups took an approach of learners writing blog posts on their topic, from different perspectives, without any consultation with their assigned group members, and then commented on other learner's blog posts.
2. A more collaborative approach to completing the task was also observed in all three of the environments, where learners built on the blog posts of their assigned group members, clearly stating it at the start.
3. The style of blog posts were also very similar across the three environments, where learners often shared content in the form of text when making writing about a particular topic. This was sometimes aided with images, or videos, but rarely consisted of learners providing an opinion.

Table 1-17: Task Based Trends in the Blog enabled CLEs

Presented next are the *characteristic based trends* that were observed across the log enabled CLEs.

1.6.2.2 Characteristic Based Trend: Group Participation

As shown in Figure 1-5, four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Group Participation* across each of the three SMECLEs, except for IS2200, where there were no instances of *User Generated Content* enabling *Group Participation*. It was also observed that there was at least one instance at each level: assigned group, class group, and discipline community group, although these did not occur for each characteristic, or in each learning environment. There were two trends observed across the three environments, shown in Table 1-18.

1. It was observed across each of the blog enabled collaborative learning environments, that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Group Participation* in two of the SMECLEs, namely IS6118, and IS1100, with three of the four social media characteristics enabling *Group Participation* in IS2200, with instances at all levels: assigned group, class group, and discipline community group
2. It was also observed across the three SMECLEs that the majority of instances occurred at the class group level for all of the characteristics.

Table 1-18: Characteristic Based Trends in the Blog enabled CLEs

Presented next are the cell based trends that were observed across the blog enabled CLEs.

1.6.2.3 Cell Based Trend: "Social Collaboration, Active Learning" was a Class Group Experience

Across all three of the environments, *Active Learning* was enabled by *Social Collaboration*, as shown in Figure 1-5, most often when learners asked questions of other learners, but also when they agreed with other learners and explained why, and sometimes when they disagreed with other learners and explained why. There were two trends observed across the environments, shown in Table 1-19.

1. When learners did ask questions, or agree/disagree with another learner, they were more likely to get an acknowledgement than be ignored.
2. When learners were asking questions, or agreeing/disagreeing with other learners, they were mostly class group instances as opposed to assigned group instances.

Table 1-19: Cell Based Trends in the Blog enabled CLEs

Following the presentation of the trends that were observed across both the microblog enabled CLEs, and the blog enabled CLEs, the next section introduces the contributions from this research.

1.7 Research Contributions

The primary contribution of the study, the evaluation framework for social media enabled collaborative learning environments (SMECLEs), is introduced and explained. This contribution is presented using three of the four DSR artefacts, namely model, method, and instantiation, as per Hevner et al. (2004). Then the secondary contribution is introduced and explained, which is the IS DSR process model for developing frameworks as an artefact through DSR.

1.7.1 SMECLE Evaluation Framework

The primary contribution of this research, to both the knowledge base and to practice, is the SMECLE evaluation framework. However, like other research that has developed frameworks from DSR (McNaughton et al., 2010; Abbasi et al., 2012; Hustad and Olsen, 2014), it is not possible to fit such a framework into one of the four DSR contributions suggested by Hevner et al. (2004), namely: constructs, models, methods, and/or instantiations. Instead, it is evident that such a framework is made up of each of these elements: the constructs are the characteristics of social media, and collaborative learning; the model is the representation of the social media characteristics juxtaposed against the characteristics of collaborative learning; the methods are the rules that explain how the social media characteristics enable the collaborative learning characteristics; and the instantiation is when the evaluation framework is used to evaluate SMECLEs, where trends can be observed. Three of the four of these are thus considered DSR contributions from this study: the model, the methods, and the six instantiations. The model and methods are contributions to the knowledge base, and are introduced next. This is followed by the instantiation, which is a contribution to educators.

1.7.1.1 Model

Previously there was a lack of understanding in the knowledge base as to whether social media enabled collaborative learning. To improve this understanding, this research organised the constructs that were identified in the literature review, namely the characteristics of social media, and the characteristics of collaborative learning, into a model. This model provides a structure expressing relationships that exist between these constructs, in a SMECLE, which is presented in Figure 1-6. The following prescriptive design knowledge was created: relationships exist between four of the characteristics of social media: *Social Interaction*, *Social Collaboration*, *Content Sharing*, and *User Generated Content*, and the five characteristics of collaborative learning, and these can occur at different levels depending on the relationship being discussed, as is evident in Figure 1-6. This prescriptive design knowledge thus satisfies the criteria for nascent theory by providing a model that increases our understanding of the relationships that exist between the characteristics of social media and the characteristics of collaborative learning in a SMECLE. This is a contribution to the knowledge base at Level 2 of the Gregor and Hevner (2013) DSR contribution types.

			Task																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Social Media Platform	**Social Media Characteristics**	Social Interaction																		
		Social Collaboration																		
		Content Sharing																		
		User Generated Content																		
		Social Connectedness																		

I = Individual
AG = Assigned Group
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I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Figure 1-6: SMECLE Evaluation Framework

1.7.1.2 Method: Cell Rules for the SMECLE Evaluation Framework

While the model in Figure 1-6, provides a structure between the constructs, it is missing the rules that explain how the social media characteristics enable the characteristics of collaborative learning in a SMECLE. To achieve this, base rules were originally created for all twenty-five cells in the evaluation framework by understanding each social media characteristic, and how they may enable any of the collaborative learning characteristics. Then, over the six design cycles, sixteen of these base rules evolved, until no further improvements were identified. Presented in the following tables (Table 1-20, Table 1-21, Table 1-22, Table 1-23, and Table 1-24) are the completed rules for each of the sixteen cells from Figure 1-6. Such prescriptive knowledge does not exist in the knowledge base, and therefore needed to be created. With this new prescriptive design knowledge, it is now not only evident that sixteen social media characteristics can enable collaborative learning characteristics in a SMECLE (as represented by the model in Figure 1-6), but it is also understood how they do so. This prescriptive design knowledge thus satisfies the criteria for nascent theory by providing these rules, and is a contribution to the knowledge base at Level 2 of Gregor and Hevner (2013) DSR contribution types.

	Active Learning			
	I	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, but no group member acknowledges it.	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.
Social Collaboration	A learner asks a group member(s) a question(s) in relation to the task, but no group member acknowledges it. or A learner agrees/disagrees with a group member(s) in relation to the task, and explains why, but no group member acknowledges it.	A learner asks an assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it. or A learner agrees/disagrees with an assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it.	A learner asks a class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it. or A learner agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it.	A learner asks a discipline community group member(s) a question(s) in relation to the task, and at least one discipline community group member acknowledges it. or A learner agrees/disagrees with a discipline community group member(s) in relation to the task, and explains why, and at least one discipline community group member acknowledges it.
Content Sharing	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it.
User Generated Content	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges, it showing their understanding of it.	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table 1-20: Active Learning Cell Rules

	Group Participation		
	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member.	A learner makes a comment in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member.	A learner makes a comment in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member.
Social Collaboration	An assigned group member asks another assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by at least one assigned group member, and a consensual answer is reached. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why and at least one assigned group member acknowledges it, which is further acknowledged by a least one assigned group member, and a consensual answer is reached.	A class group member asks another class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by at least one class group member, and a consensual answer is reached. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by a least one class group member, and a consensual answer is reached.	A discipline community member asks a class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by a least one class or discipline community group member, and a consensual answer is reached. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by at least one class or discipline community group member, and a consensual answer is reached.
Content Sharing	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.
User Generated Content	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 1-21: Group Participation Cell Rules

	Role of the Instructor			
	I	AG	CG	DCG
Social Interaction	The instructor makes a comment in relation to the task, but no group member acknowledges it.	The instructor makes a comment to an assigned group in relation to the task, and at least one assigned group member acknowledges it.	The instructor makes a comment to the class group in relation to the task, and at least one class group member acknowledges it.	The instructor makes a comment to the discipline community group in relation to the task, and at least one discipline community member acknowledges it.
User Generated Content	The instructor creates, and shares some original content in relation to the task, but no group member acknowledges it.	The instructor creates, and shares some original content in relation to the task to an assigned group, and at least one assigned group member acknowledges it, showing their understanding of it.	The instructor creates, and shares some original content in relation to the task to the class group, and at least one class group member acknowledges it, showing their understanding of it.	The instructor creates, and shares some original content in relation to the task to the discipline community group, and at least one discipline community member acknowledges it, showing their understanding of it.

Table 1-22: Role of the Instructor Cell Rules

	Learner Diversity			
	I	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, drawing on their background, but no group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one class group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.
User Generated Content	A learner creates, and shares some original content in relation to the task, drawing on their background, but no group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one class group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.

Table 1-23: Learner Diversity Cell Rules

	Learner Relationships		
	I-to-L	L-to-L	L-to-I
Social Interaction	A relationship is formed, or strengthened, when an instructor makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and an instructor acknowledges it.
Social Collaboration	A relationship is formed, or strengthened, when an instructor asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when an instructor agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, and an instructor acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and an instructor acknowledges it.
Content Sharing	A relationship is formed, or strengthened, when an instructor shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and an instructor acknowledges it.
User Generated Content	A relationship is formed, or strengthened, when an instructor creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and an instructor acknowledges it.

Table 1-24: Learner Relationship Cell Rules

The model, and these rules, was instantiated a number of times across 6 SMECLEs, where a number of trends were identified, and these are introduced next.

1.7.2 Instantiation of the SMECLE Evaluation Framework

Kane and Fichman (2009) made a call for IS educators, who are often IS researchers also, to start adopting social media platforms in the classroom to teach students in order to remain relevant in a world being changed by information technology. While they state it might take some trial and error on behalf of faculty to develop effective teaching processes for using these platforms, this research has established relevant knowledge that can be leveraged by educators intending to adopt these platforms, helping to reduce this trial and error. It is only through the adoption of the SMECLEs by such experts, that they can be further analysed and improved upon, and in a variety of case situations also, such as different modules, number of learners, and different tasks. Throughout the following sections a guide is provided that can be applied by educators when they wish to run, and evaluate, their own SMECLEs, while in addition generating knowledge that can be used in these SMECLEs. The first step is identifying the reason(s) to implement a SMECLE, which is presented next.

1.7.2.1 Identifying the reason(s) to implement a SMECLE

While there are calls for social media to be introduced to learning environments, introducing it is not such a simple task, and should not be done just for the sake of it (Kane and Fichman, 2009). Educators need to consider if implementing such technology into their learning environments is beneficial for the learners. In terms of this research, as an educator, it was understood that by implementing social media in the current traditional approach to learning, little benefit would be gained by the learners. Instead, it was understood that changing from a traditional approach to a collaborative one, which actively engages learners in the learning process, would generate more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners. Therefore, creating collaborative learning environments through social media platforms was not done for the sake of it, but looked to create more actively engaged learners. The next step was to create and run a SMECLE.

1.7.2.2 Creating and Running a SMECLE

Two types of social media platforms were identified as being suitable for possibly enabling collaborative learning: microblogs, and blogs, as they allow learners to interact with each other, and it is possible to create groups that can work together towards solving a task. These also provided an interesting contrast with each other in terms of what could be achieved to create a collaborative learning environment. Two types of SMECLEs were thus created, and followed the design principles (DPs) on how to create them in Table 4-8.

Step	Explanation
1.	The Instructor chooses a social media platform to use.
2.	The instructor creates the rules that the learners should work within.
3.	The instructor sets up their SMP account.
4.	The instructor creates the groups of 3-4 members and this list should be provided to the learners.
5.	The instructor creates the task that must be completed – this will be dictated by how long they wish the class to go on for, where the more time they assign, the more challenging the task.
6.	The learners create accounts for the SMP being used.
7.	Learners connect their accounts with other learners if necessary

Table 1-25: Steps for Creating a SMECLE

Once the instructor and the learners had created their accounts, the class was run for the decided upon period of time, which allowed data to be created from the interactions in the learning environments. This data was then used to evaluate the effectiveness of the collaborative learning by evaluating it with the SMECLE evaluation framework, which is introduced next.

1.7.2.3 Evaluating a SMECLE for its effectiveness

Previously, no such tool existed for educators to be able to evaluate if their SMECLEs are effective at enabling collaborative learning. The framework provides educators with the specific mechanisms by which a social media characteristic enables a collaborative learning characteristic. From this analysis trends can be identified, which provides educators with knowledge on where their SMECLEs were effective, and where they can be improved upon. For example, for the first microblog enabled CLE, IS6119, the data that was generated was gathered, and analysed by reading through it, and any time a piece of data complied with one of the rules from section 6.2.2, it was marked into that section of the evaluation framework as a 1 to denote an instance. This created the picture for the educator of how effective collaborative learning was in their SMECLE. This process was completed for all six of SMECLEs by the educator in this research, and a cross comparison of the results can be seen in Figure 1-7.

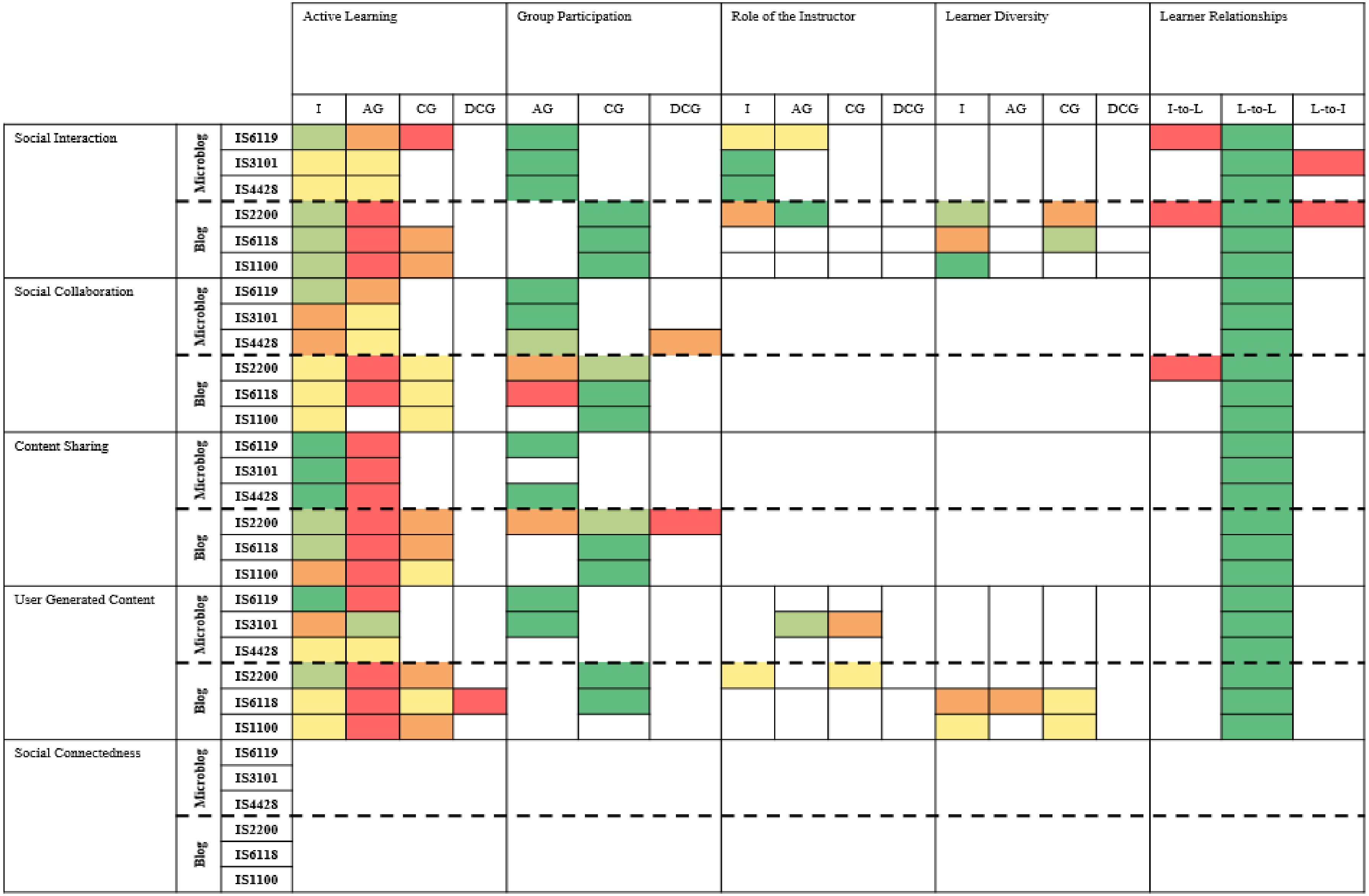

Figure 1-7: Cross Case Comparison of Microblog and Blog enabled Collaborative Learning Environment

A number of trends were also observed by analysing the completed SMECLE evaluation framework from each class, and these are presented next.

1.7.2.4 Trends that were observed across the SMECLEs

After completing the evaluation of the six SMECLEs with the evaluation framework, as an educator, each completed evaluation framework was compared and contrasted to identify both common and uncommon trends that occurred across the SMECLEs. The trends that were observed across the collaborative learning characteristics are presented in Table 1-26. This prescriptive design knowledge satisfies the criteria for situated implementation of an artefact, and is a contribution to practice at Level 1 of Gregor and Hevner (2013) DSR contribution types.

Characteristic	**Trend**
Active Learning	Microblog enabled CLEs are effective at enabling *Active Learning* to occur at assigned group levels, while blog enabled CLEs are effective at enabling *Active Learning* at class group levels, when the task is to blog on different categories while commenting on other users blogs also.
Group Participation	Microblog enabled CLEs mainly enable *Group Participation* instances to occur at an assigned group level, which is in stark contrast to blog enabled CLEs, where the majority of instances occur at the class group level.
Role of the Instructor	Regardless of the platform being used, the instructors rarely interacted with the learners, both from initiating the interaction, or receiving it, with *Roll of the Instructor* instances only being observed through the *Social Interaction* and *User Generated Content* characteristics.
Learner Diversity	Microblog enabled CLEs did not enable *Learner Diversity*, but blog enabled CLEs did enable it through the *Social Interaction* and *User Generated Content* characteristics.
Learner Relationships	Regardless of the platform being used, the majority of Learner Relationships instances occurred at the learner-to-learner level, which is expected in a CLE.

Table 1-26: Observed Trends across the SMECLEs

Introduced in the following section is an explanation of the implications for practice following the instantiation of the SMECLE evaluation framework.

1.7.2.5 Implications for Practice

Twenty years ago, it was proclaimed that collaborative technologies were able to impact the learning environments of educational institutions, where it was suggested that by actively engaging learners in the learning process, it should generate more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners. Despite research indicating that these collaborative technologies could impact the learning environments, and in a positive way, no change occurred. Twenty years later, the very same claims are being made, where a new collaborative technology, namely social media, is being proclaimed to be able to impact the learning environments of education institutions, by changing, and possibly improving, the pedagogical approach. The impact again comes in the form of changing from a traditional learning approach, to a collaborative learning approach. However, there is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning. This study helps towards improving this understanding.

Firstly, critical thinking was observed amongst learners in the SMECLEs when they were creating well thought out and reasoned arguments, when creating their own posts, or responding to other learners. These observations suggest that learners were exposed to different perspectives, while also forming their own opinions based on these, which facilitates the formation and/or modification of mental models, thus increasing learning effectiveness (Alavi, 1994). Secondly, learners were also observed to be providing more creative responses. While learners providing generic answers were observed, there were many instances where learners used different techniques to provide varying types of answers. These observations suggest that SMECLEs enhance learning by facilitating active construction and development of emergent knowledge (Alavi, 1994). Thirdly, high-level reasoning strategies were also observed amongst learners. Rather than just copying and pasting content from sources (which was also observed), learners were seen to be using different types of content to be part of their arguments, showing their understanding of it. These observations suggest that SMECLEs contribute to learning effectiveness by requiring learners to understand the content they are using to be able to incorporate it as part of their arguments.

This knowledge indicates that the platforms of social media can be effective at enabling collaborative learning. Each of the outcomes expected from collaborative learning, namely critical thinking, creative responses, and higher level reasoning strategies, amongst learners, were observed across the six social media enabled collaborative learning environments. Therefore if educators wish to generate more critical thinking, creative responses, and high-level reasoning strategies, amongst their learners, they need to actively engage learners in the learning process, and one such way of achieving this is by running SMECLEs. It is now up to educators to adopt them into their learning environments, and avoid the same mistake as twenty years ago, where the knowledge was not applied, which resulted in little change in the learning environments of educational institutions. The secondary contribution of this research, the IS DSR process model, is introduced next.

1.7.3 IS DSR Process Model for Developing Frameworks as an Artefact

This study makes an important contribution to DSR in terms of methodology, by extending an IS DSR process model that helps to produce and present a framework as a DSR artefact. This is in relation to (Lee et al., 2015), where the argument is made that the DSR community need to move away from the idea of DSR just producing IT artefacts, but should focus on IS artefacts. To develop the process model used in this study, extant IS DSR methodology literature was reviewed (Nunamaker et al., 1990; March and Smith, 1995; Rossi and Sein, 2003; Peffers et al., 2007; Kuechler and Vaishnavi, 2008), where their process models were compared and contrasted. From this review it was evident that often the process elements used in each process model were very similar, with some of the models having additional elements. This provided an opportunity to develop a more robust process model, by fusing together the consistent process elements that occur across the five process models. The resulting IS DSR process model is presented in Figure 1-8.

However, where this process model differs from the others in the IS literature, is it utilises the seven DSR guidelines offered by Hevner et al. (2004) to help guide each process element, as shown in Figure 1-8. This has not been observed in the literature previously, and greatly enhances the process model by providing further clarity to researchers in terms of how to successfully complete each process element. To demonstrate the use of the IS DSR process model, it was evaluated by its application to produce and present this study. How the research from this study has been communicated is presented next.

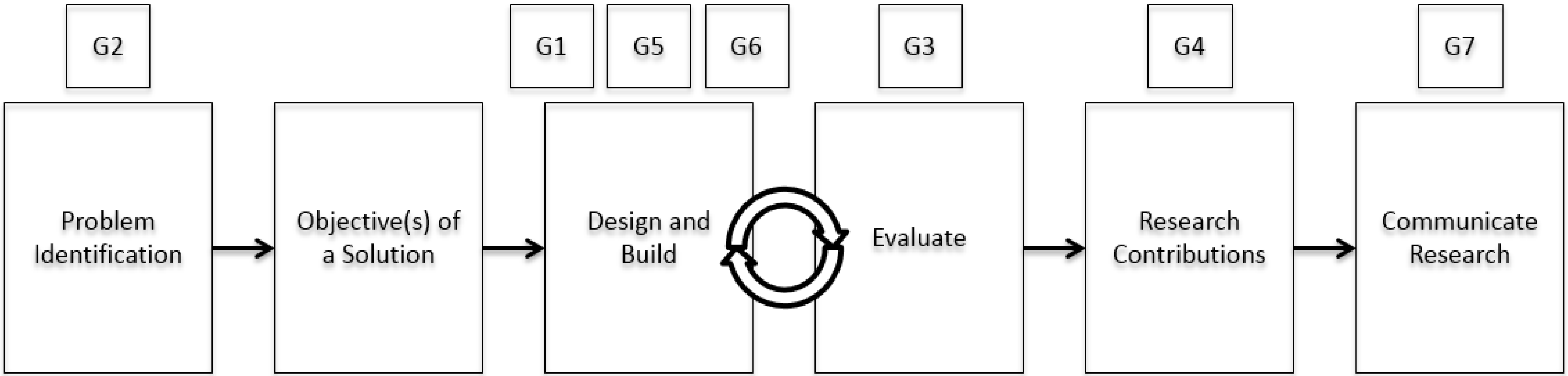

Figure 1-8: The IS Design Science Research Process Model Used for this Study with Researcher Reflections

1.8 Communicate Research

It is necessary to communicate the resulting knowledge from the research. This is achieved by communicating *"the problem and its importance, the artifact, its utility and novelty, the rigor of the design, and its effectiveness to researchers and other relevant audiences such as practicing professionals, when appropriate"* (Peffers et al., 2007, p.56). It is only when this knowledge is disseminated that other researchers and practitioners can begin to benefit from the research effort, otherwise it will go unnoticed. To communicate this research, a number of sources have been used, including conferences, and journals, each representing different aspects of this research. For example, there was a poster that was presented at the European Conference on Information Management and Evaluation (ECIME) which was an early version of the evaluation framework, and explanation of the building blocks. This was further built on with a publication in the Journal of Decision Systems, which is a more current version of the framework. The literature review that was conducted on social media in this study was also published at IFIP WG 8.3 and SIGDSS Open Conference, where it was used to represent different trends that can be observed from the concept matrix that was created. Finally, there was a call for submissions of exemplar DSR for a special issue on DSR in EJIS, an AIS senior scholars' basket of (eight) journal. An article, which focused on each stage of the process model used in this study, and the contents of these stages, was submitted for consideration. Feedback has been very positive, where the article has been marked as a very promising paper, requiring some revisions to be considered for review in the special issue. These revisions will be made, with the possibility of the research being accepted as exemplar DSR for the special issue.

1.9 Summary

This chapter sought to provide an overview of each of the chapters that are in this study, providing the findings of each. This was achieved by summarising each chapter, where an explanation of what DSR is to this study is explained. Then, the relevant problem that needs to be addressed was introduced, the objective for such a solution was inferred from it, and two research questions that helped to achieve this objective were explained. The design cycles that were applied were then outlined, where the evaluation framework that was designed, built, and evaluated, was presented. This was followed by the evaluation of three microblog enabled collaborative learning environments, where the trends across each were explained, which was followed by the same evaluation of three blog enabled CLEs. Then, the contributions that the study has made were justified, followed by how this research has been communicated. Each chapter provides greater detail to these summaries, beginning with an explanation as to what design science research is in the next chapter.

Chapter 2 What is Design Science Research?

2.1 Introduction

It is important for IS research to inform practitioners but it often fails to accomplish this (Agarwal and Lucas Jr, 2005; Gill and Bhattacherjee, 2009) as the contribution of IS research to practice today is underwhelming (Gill and Bhattacherjee, 2009). In fact, practitioners often question the relevance to practice of IS research published in the leading IS journals, as it is too often years behind current trends (Benbasat and Zmud, 1999; Rosemann and Vessey, 2008). To be able to rectify this, Benbasat and Zmud (1999) suggest that IS researchers should look to practice to identify a topic to research, and then look at the academic literature available, but this leads to the perception that if research is relevant, it lacks rigor (Rosemann and Vessey, 2008).

Design science research (DSR) is an approach that looks to achieve relevance to practice by providing new innovative artefacts that address heretofore unsolved problems or address them more effectively/efficiently than previous attempts, in a rigorous manner (Hevner et al., 2004; Winter, 2008). There has been an increasing interest in DSR (Nunamaker et al., 1990; Walls et al., 1992; March and Smith, 1995; Hevner et al., 2004; Iivari, 2007; Peffers et al., 2007; Baskerville, 2008; McKay et al., 2012), and based on the numerous DSR publications across the leading IS journals and conferences, it is highlighted as an acceptable approach to take when conducting IS research (McKay et al., 2012).

However, while there is agreement in the community on the belief that DSR is engaged in a discourse of discovery, there is yet to be broad agreement on issues such as terminology, methodology, evaluation criteria, etc. (Baskerville, 2008). These deficiencies require a researcher who wishes to undertake a DSR approach to state what they think DSR is. For this study, the Hevner et al. (2004) and Hevner (2007) view of DSR is adopted, as it is highly regarded amongst researchers, and is the dominant IS DSR research approach used (Kuechler and Vaishnavi, 2008; McKay et al., 2012).

The remainder of this chapter is organised as follows: the preceeding sections answer numerous questions that are often asked about DSR, such as: what constitutes IS design science research? (March and Smith, 1995; Hevner et al., 2004; Baskerville, 2008; Winter, 2008; Gleasure et al., 2012); what constitutes a design science research artefact? (Kuechler and Vaishnavi, 2008; Iivari, 2015; Lee et al., 2015); what constitutes a design science research contribution? (March and Smith, 1995; Hevner et al., 2004; Papas et al., 2012); and what constitutes theory in design science research? (Gregor and Jones, 2007; Baskerville, 2008; Kuechler and Vaishnavi, 2008; Gregor and Hevner, 2013). Once these questions are answered, a review of IS design science research process models is conducted, and a new IS DSR process model is created to direct this research, where the seven Hevner et al. (2004) guidelines are mapped onto this process model to provide guidance. This provides the backbone/foundations for this research, and informs the titles of the subsequent chapters of this thesis. First, the methodology for the literature review that was conducted is introduced.

2.2 Literature Review Methodology

The methodology for conducting a literature review, introduced in Chapter 1, was applied to conduct a review of design science in IS research. The aim of this literature review was to answer the questions listed in the previous paragraph. Further to this, it was used to identify published articles that outline a DSR methodology. Table 2-1 presents the steps for this literature review, where a total of 76 articles were identified from the initial search, referred to as Iteration 1, where the search ranged from 1984 – 2015. This involved identifying articles that contained any of the key words that were highlighted as being relevant (and when new words were highlighted, the search was started over). From these 76 articles, a detailed review was undertaken of the abstracts and keywords of each one, referred to as Iteration 2. This review was used to identify articles that would help specifically answer the questions around DSR identified above, resulting in a reduction in the number of articles to 45. Each of these were then reviewed, where 15 of these articles were then used to create the DSR concept matrix. The synthesis afforded by the concept matrix was leveraged to answer the questions, and each of these answers is presented in the following sections, starting with an introduction to DSR in IS.

Phase	Step	Outcome
1. Selecting the Sources	Specify the domain of interest.	Social Media
	Identify relevant sources for selected domain.	Conferences: AMCIS; ECIS; ICIS Journals: Senior Scholars' Basket of Journals
2. Search Strategy	Identify key search terms.	Design Science, Design Science Research, Design Theory, Design Science Approach
	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their "title", "abstract" or "keywords" section.	Conferences: 14 AMCIS Articles; 16 ICIS Articles; 14 ECIS Articles Journals: 9 EJIS Articles; 3 ISJ Articles; 2 ISR Articles; 3 JAIS Articles; 3 JIT Articles; 5 JMIS Articles; 6 JSIS Articles; 1 MIS Quarterly Articles
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	Conferences: 6 AMCIS Articles; 8 ECIS Articles; 11 ICIS Articles Journals: 8 EJIS Articles; 1 ISJ Articles; 2 ISR Articles; 0 JAIS Articles; 2 JIT Articles; 3 JMIS Articles; 3 JSIS Articles; 1 MIS Quarterly Articles
3. Coding Schemes	Determine what is going to be captured from the pool of articles.	Design Science Overview, Design Science Artefact s, Design Science Contributions, Design Science Methodologies, Theory in Design Science
4. Article Review	Read the articles, and capture the required data.	Concept Centric Matrix for Design Science Research
5. Analysis and Write Up	Analyse the gathered data, and report findings.	Explanation of Design Science Research

Table 2-1: Literature Review of Design Science Research

2.3 IS Design Science Research

The foundations of design science can be traced back to 1969 with Herbert Simon's book *"The Science of the Artificial"*, where it is generally accepted that design science originates from chapter five titled *"The Science of Design"* (Baskerville, 2008). Simon posits a number of ideas that have since become the underlying principles on which researchers have built the IS design science research paradigm. First it is understood from this chapter that the science of design began in the engineering schools, in areas such as computer science and systems engineering, with the focus of devising artefacts to attain goals (Simon, 1969, p.133). These artefacts must have utility to real-life problems (Simon, 1969, p.137), where the search processes for developing the artefacts are viewed as *"processes for seeking a problem to a solution"* (Simon, 1969, p.148). Finally, (Simon, 1969, p.149) also indicates that the design of artefacts should not rely on a single generate-test cycle, but that there should be multiple cycles to guarantee the discovery of any important indirect consequences.

From these principles, numerous IS researchers began to develop an IS specific design science research paradigm, with many agreeing that the seminal IS articles for such a paradigm are creditied to Nunamaker et al. (1990), Walls et al. (1992), and March and Smith (1995) (Peffers et al., 2007; Kuechler and Vaishnavi, 2008; McKay et al., 2012; Lee et al., 2015). However, it was the Hevner et al. (2004) article titled *"Design Science in Information Systems Research"*, which built upon the earlier seminal articles of Walls et al. (1992), and March and Smith (1995) (McKay et al., 2012), that has captured the most attention from the IS academic community, making it the most widely adopted approach to DSR in IS research (Kuechler and Vaishnavi, 2008; McKay et al., 2012), despite other approaches existing (Baskerville, 2008; Kuechler and Vaishnavi, 2008; Gleasure et al., 2012; McKay et al., 2012).

The other approaches that exist include *"Systems Development Research"* (Nunamaker et al., 1990), *"Information Systems Design Theories (ISDTs)"* (Walls et al., 1992), *"Action Design Research"* (Sein et al., 2011), and *"Socio-Technical IS Design Science"* (Carlsson et al., 2011), where each offers their own differences and disagreements amongst researchers on what constitutes DSR (Baskerville, 2008). In fact Baskerville (2008) likens these disagreements to the one of trying to agree on a meaning for the term *"theory"*. Unsurprisingly, these kinds of disagreements can lead researchers in the broader IS discipline to question the relevance and rigor of DSR, so each of these questions need to be answered to provide an understanding of how they are understood for this study. This is done in the following sections, first asking, and answering, the question of what constitutes IS DSR.

2.3.1 What Constitutes IS Design Science Research?

While natural science is concerned with the body of knowledge about objects in the real world such as the characteristics and properties that they have; or how they behave and interact with each other (Simon, 1969, p.3), design science is concerned with knowledge about artificial objects and phenomena (Simon, 1969, p.6). This is important as IS research is focused on understanding artificial phenomena created by humans such as organisations and information systems, as opposed to natural occurring phenomena (March and Smith, 1995) making it an ideal area to conduct DSR.

Baskerville (2008, p.441) states that at its core, DSR is *"directed toward understanding and improving the search among potential components in order to construct an artefact that is intended to solve a problem"*, which indicates that for research to be considered in the domain of DSR, it must offer some kind of an artefact that can be used to solve a problem (Peffers et al., 2007). This idea of an artefact is further expanded by Hevner et al. (2004, p.77), stating that DSR *"creates and evaluates IT artefacts intended to solve identified organizational problems"*. In fact, as shown in Table 2-2, the definitions across DSR draw on the same concepts, where it is agreed that DSR needs to create an artefact that serves to solve an organisational problem, in a rigorous way, where new knowledge and insights are created for the knowledge base.

IS Design Science Research Definitions	Reference
Design science attempts to create things that serve human purposes.	March and Smith (1995, p.253)
Design science, as the other side of the IS research cycle, creates and evaluates IT artefacts intended to solve identified organizational problems.	Hevner et al. (2004, p.77)
DS research offers an important paradigm for conducting applicable, yet rigorous, research, i.e., research that is closer to IS's applied raison d'être.	Peffers et al. (2006, p.85)
Design science is directed toward understanding and improving the search among potential components in order to construct an artefact that is intended to solve a problem.	Baskerville (2008, p.441)
We use the term DSRIS to indicate IS research that uses artefact design and construction (learning through building) to generate new knowledge and insights into a class of problems.	Kuechler and Vaishnavi (2012, p.396)
Based on an existing theoretical knowledge base, design science research typically involves constructing and evaluating new IT artefacts, constructs, models, methods, or instantiations to address organisational IT problems.	Oetzel and Spiekermann (2014, p.127)

Table 2-2: IS Design Science Research Definitions

This agreement amongst researchers suggests that rather than just merely creating an artefact in the hope of solving some problem, the goal should first be to identify a problem that needs to be solved (a relevance cycle), then the grounding for a solution should come from the scientific knowledge base (a rigor cycle). An artefact should then be designed, built, and evaluated until it can no longer be improved (a design cycle), with contributions to both practice and the knowledge base coming from the research. Hevner (2007) declares that these three cycles need to occur for research to be considered DSR.

These three cycles are presented in Figure 2-1, which is a representation of what constitutes DSR. The relevance cycle consists of identifying the problem to be solved, gathering requirements for the artefact, and testing the artefact in the field. The rigor cycle occurs in the scientific knowledge base, where grounding for the research is developed (i.e. identifying methods and/or theories already available that are necessary). Finally the design cycle is where the building of the artefact occurs (based on the knowledge gathered from both the relevance cycle and rigor cycle), and it is evaluated based on the set criteria. This consists of a number of iterations until the artefact is fit for the purpose it was designed for, and can no longer be improved. The relevance and rigor cycles then continue where contributions from the research are added to practice and to the knowledge base, i.e. the artefact is a contribution to both practice and the knowledge base (theory).

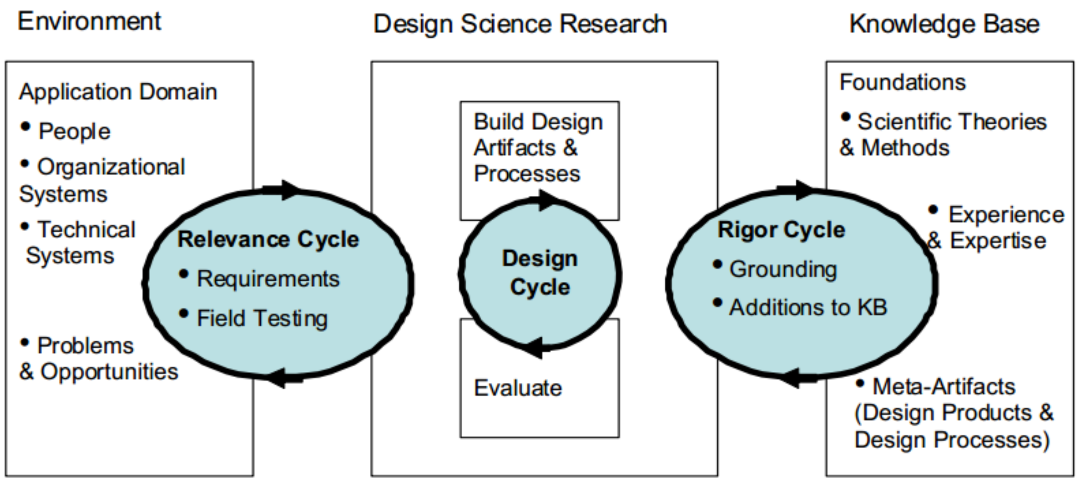

Figure 2-1: Design Science Research Cycles (source: Hevner, 2007)

While Figure 2-1 is a representation of what constitutes DSR, it can be difficult to understand how to conduct this type of research. To aid this, Hevner et al. (2004) suggest seven DSR guidelines, presented in Table 2-3 that can be applied to conduct design science research. The issue with these guidelines is that Hevner et al. (2004, p.82) do not promote mandatory or rote use of these guidelines, but instead insist researchers should use their *"creative skills and judgment to determine when, where, and how to apply each of the guidelines in a specific research project"*. This allowance of *"pick and mix"* behaviour can potentially dilute the standard of DSR, as researchers could position their research as design science based on following only one of the seven guidelines, as they will have used their creative skills and judgement. This impacts negatively on the IS design science paradigm, as again, other researchers outside the paradigm in the IS discipline could potentially see it as lacking rigor. To overcome this issue, a process model that can help structure the DSR process, where the seven Hevner et al. (2004) guidelines can also be applied to ensure effective DSR.

Guideline	Description
1. Design as an artefact	Design-science research must produce a viable artefact in the form of a construct, a model, a method, or an instantiation.
2. Problem Relevance	The objective of design-science research is to develop technology-based solutions to important and relevant business problems.
3. Design Evaluation	The utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well-executed evaluation methods.
4. Research Contributions	Effective design-science research must provide clear and verifiable contributions in the areas of the design artefact, design foundations, and/or design methodologies.
5. Research Rigor	Design-science research relies upon the application of rigorous methods in both the construction and evaluation of the design artefact.
6. Design as a Search Process	The search for an effective artefact requires utilizing available means to reach desired ends while satisfying laws in the problem environment.
7. Communication of Research	Design-science research must be presented effectively both to technology-oriented as well as management-oriented audiences.

Table 2-3: Design Science Research Guidelines (source: Hevner et al., 2004)

With this understanding of what constitutes IS DSR, the implications for this study are outlined next.

Implications for this Study

This representation of what constitutes DSR has been adopted for a number of studies in the IS literature, including Oetzel and Spiekermann (2014), Arnott (2006), Hustad and Olsen (2014), Kolfschoten and De Vreede (2009), Abbasi et al. (2012), and Adomavicius et al. (2008), and by reviewing each of these articles, a number of trends were observed. All of these studies explicitly stated what approach they were taking in terms of DSR, and provided an understanding of what that meant for their research. Interestingly no study took the Hevner (2007) approach by itself, with only one article using it, Oetzel and Spiekermann (2014), stating they adopted a DSR approach from Hevner et al. (2004), Gregor (2006), and Hevner (2007). Further, a number of these studies mention the seven guidelines from Hevner et al. (2004) in some form (Arnott, 2006; Adomavicius et al., 2008; Kolfschoten and De Vreede, 2009; Abbasi et al., 2012), however only one of them actually apply the guidelines to explain how each one was used in some relation to their research (Kolfschoten and De Vreede, 2009). Instead the majority of articles refer to the guidelines, but do not use them explicitly. Also, two of the studies refer to using a process model for conducting DSR, where both adapted their models from others (Arnott, 2006; Hustad and Olsen, 2014) and also used it to present their research. The other articles did not mention using any process model (Adomavicius et al., 2008; Kolfschoten and De Vreede, 2009; Abbasi et al., 2012).

What is evident across all these articles is that they all have concise literature reviews done, a necessary component of DSR, where the knowledge base is researched to develop a grounding for the research. However, a critical element that some of the articles are missing, despite each one saying how important the design cycles of DSR are, is they do not show their actual phases of the design and build of their artefact(s), preferring instead to show their completed artefact, and then evaluate it (Arnott, 2006; Adomavicius et al., 2008; Abbasi et al., 2012). None of these even acknowledge how many phases of design, build, and evaluate it took to create the artefact(s). Two articles did do this (Kolfschoten and De Vreede, 2009; Hustad and Olsen, 2014), who explicitly show each phase of their design cycles, explaining how their artefact was designed, built, and evaluated, and how the learning was used to improve their artefact(s).

Much has been learned from these studies in setting out how to produce and present DSR for this study. Firstly, a statement is necessary to provide an understanding of what DSR is, and where this is drawn from. Secondly, it is ineffective to mention the guidelines from Hevner et al. (2004), or the design cycles from Hevner et al. (2004) or Hevner (2007) and not apply them in the research. Thirdly, a process model can be used to produce DSR, and present it, which helps to strengthen the research by applying steps that have been formed in the literature. Fourthly, it is necessary to show the design and build phases of the design cycles, and not just the evaluation ones, as much of the research above has done. Therefore, for this study, the understanding of what constitutes DSR is drawn from Hevner et al. (2004), and Hevner (2007). That is to say, DSR consists of identifying a relevant problem in practice, and then looking to the scientific knowledge base to develop the grounding of the research. Some form of an artefact must then be designed, and built to solve the identified problem, and this is measured by evaluating it for its usefulness. The contributions to both practice and the knowledge base must then be explained. It is also understood that the seven guidelines offered by Hevner et al. (2004) can be used to help guide the study, but more importantly, can be mapped to a process model to help guide it, and such a process model is necessary to produce and present DSR. While an understanding of what DSR is to this study has now been explained, an understanding of what constitutes a DSR artefact is presented in the next section, followed by what constitutes a design science contribution, and what constitutes theory in DSR.

2.3.2 What Constitutes a Design Science Research Artefact?

DSR attempts to create artefacts that serve human purposes (March and Smith, 1995). That is to say that artefacts are created to address real organisational problems (Hevner et al., 2004). The artefacts that are created must then be assessed against criteria of value or utility, i.e. Does the artefact work? Does the artefact make an improvement? (March and Smith, 1995). Through the construction of these artefacts, design science researchers both apply knowledge from the scientific knowledge base, and produce new knowledge to add to this knowledge base (March and Smith, 1995; Hevner, 2007). However, designing an artefact that solves an identified problem alone does not constitute DSR as it has not only to be relevant, but also to be constructed rigorously (Winter, 2008). In fact it is the rigor of constructing artefacts that distinguishes IS DSR from the practice of just building IT artefacts (Hevner, 2007).

The various approaches to DSR have differences on what constitutes an artefact, and how researchers should go about developing and evaluating such an artefact (Gleasure et al., 2012). There are arguments over whether DSR must result in an artefactual production, and there are endless disagreements over what exactly constitutes an artefact. For some, the only legitimate artefact is executing code. For others, the only legitimate artefact is conceptual (e.g. the concept behind the executing code) but the artefact alone is not DSR. Table 2-4 presents the four types of design science research artefacts that March and Smith (1995) identify as outcomes of DSR, which are confirmed by Hevner et al. (2004). As such, when conducting DSR, the result may consist of producing just one of the four types of artefacts, or a variation of them (March and Smith, 1995; Hevner et al., 2004).

Artefact	Definition
Construct	Constructs form the vocabulary of the domain.
Model	A model is a set of propositions or statements expressing relationships among constructs.
Method	A method is a set of steps used to perform a task.
Instantiation	An instantiation is the realisation of an artefact in its environment.

Table 2-4: Design Science Research Artefacts (source: March and Smith, 1995)

The Hevner et al. (2004, p.82) definition of a DSR artefact includes *"not only instantiations in our definition of the IT artifact but also the constructs, models, and methods"*, while they do not include *"people or elements of organisations in our definition nor do we explicitly include the process by which such artifacts evolve often assessed by adherence to appropriate data collection and analysis techniques"*. Therefore a definition for what constitutes a DSR artefact is:

> *"A design science research artefact can consist of constructs, models, methods, and/or instantiations*."

What is not so clear from this definition however are the relationships that exist between the artefacts, as they are not necessarily based on a linear process, but in fact have many varying relationships. For example March and Smith (1995) state that models can be built from constructs, and so too can methods, before they are instantiated, or sometimes an instantiation may precede constructs, models, and methods, which presents numerous relationships that can occur. From its most basic understanding though, there is a linear relationship between the artefacts. First there is a creation of a basic language of concepts (i.e. constructs) with which to characterise phenomena (March and Smith, 1995). These constructs provide the language on which the domain is going to be based, therefore, it is the base on which any DSR is built. Constructs are necessary to provide the vocabulary that enables the construction of models (Hevner et al., 2004). Models are often used to describe tasks, situations, or artefacts. Methods are developed for building such models, and are ways of performing goal-directed activities (March and Smith, 1995; Hevner et al., 2004). Finally an instantiation of an artefact demonstrates feasibility of both the design process and of the designed product (Hevner et al., 2004).

Implications for this Study

For this study, the understanding of what constitutes a DSR artefact is that it can be a construct, model, method, and/or an instantiation but there are no set parameters on what kind of artefact must be built, and in what order, for it to be considered an outcome of DSR. A study may only produce one of these four artefacts, or produce a variation of the four, but so long as they are useful, have been built in iterative design cycles, and help towards solving a real world problem, they are considered DSR artefacts. In the IS literature, articles have discussed the different types of artefacts they have built such as Oetzel and Spiekermann (2014, p.142) developing a methodology to *"help practitioners realise the concept of privacy-by-design in their system development lifecycle"*, Adomavicius et al. (2008, p.779) defining *"a new set of constructs and methodologies"* upon which they developed *"an IT ecosystem model"*, and Singh et al. (2006, p.104) who develop multiple artefacts which includes *"construct vocabulary, symbols, and models for abstraction and representations, and methods and prototypes that illustrate proof-of-concept for evaluation"*. With this understanding of what a DSR artefact is, an understanding of what constitutes a DSR contribution is presented next, followed by what constitutes theory in DSR.

2.3.3 What Constitutes a Design Science Research Contribution?

DSR needs to make contributions to both practice and the knowledge base for it to be considered DSR, and separate it from the mere task of developing artefacts (Hevner, 2007; Winter, 2008). To achieve this, the research must be relevant to practice by being proven to solve or improve upon an identified problem, while making a contribution to the knowledge base that others can utilise in future research (Nunamaker et al., 1990; Hevner et al., 2004). By doing so, practitioners can *"take advantage of the benefits offered by the artifact,"* while allowing *"researchers to build a cumulative knowledge base for further extension and evaluation"* (Hevner et al., 2004, p.90). Therefore the contribution(s) should be in the form of a DSR artefact(s), and must address an unsolved problem, or help improve upon a current problem (Hevner et al., 2004), where the contribution lies in the novelty of the artefact (March and Smith, 1995). However, just because the artefact is being utilised in a practical manner, does not excuse it for being DSR (Hevner, 2007).

So while it is understood that a DSR contribution to practice consists of a viable artefact(s) that can be used by practitioners within its intended organisational setting, which improves upon current solutions for the identified problem, an understanding of a DSR contribution to the knowledge base must be provided. It is therefore understood that a DSR contribution to the knowledge base also consists of a viable artefact(s), but it is for the purpose of researchers, so they can further extend and evaluate it, building on the cumulative knowledge. It is necessary to also recognise the importance of contributions at more abstract levels (Gregor and Hevner, 2013). For example, other contributions to the knowledge base include "*any extensions to the original theories and methods made during the research, the new meta-artifacts (design products and processes), and all experiences gained from performing the research and field testing the artifact in the application environment"* (Hevner, 2007, p.90). The key to selling the research to both practice and academia is to outline what the contributions to both are (Hevner, 2007).

Gregor and Hevner (2013) provide two frameworks that can help justify, and position, DSR contributions to the knowledge base. The first framework, presented in Figure 2-2, enables researchers to justify their DSR contributions across three contribution types: Level 1. Situated implementation of an artefact; Level 2. Nascent design theory – knowledge as operational principles/architecture; and Level 3. Well-developed theory about embedded phenomena. Contributions can be justified across one or more of these levels, where Level 1 can be justified with instantiations of an artefact(s); Level 2 is justified by the design, build, and evaluation of an artefact(s); and Level 3 is justified by creating design theories (mid-range and grand theories). These contributions can then include any extensions to original theories, and/or methods used during the research, new design products and processes, and also any experiences gained from performing the research.

	Contribution Types	**Example Artifacts**
More abstract, complete, and mature knowledge	Level 3. Well-developed design theory about embedded phenomena	Design theories (mid-range and grand theories)
↕ ↕ ↕ ↕	Level 2. Nascent design theory—knowledge as operational principles/architecture	Constructs, methods, models, design principles, technological rules.
More specific, limited, and less mature knowledge	Level 1. Situated implementation of artifact	Instantiations (software products or implemented processes)

Figure 2-2: Design Science Research Contribution Types (source: Gregor and Hevner, 2013)

The second framework, presented in Figure 2-3, enables researchers to position their contributions based on their context, and potential contributions. This framework can be utilised to *"support a clearer understanding of the project goals and the new contributions to be achieved"* (Gregor and Hevner, 2013, p.345). That is to say, depending on the problem that is identified to be solved, an understanding of what kind of artefact(s) that will best solve this problem will need to be designed, built, and evaluated for its usefulness. This will lead to contributions that can be an improvement, invention, or exaptation, depending on domain, and the artefact that is built (Gregor and Hevner, 2013).

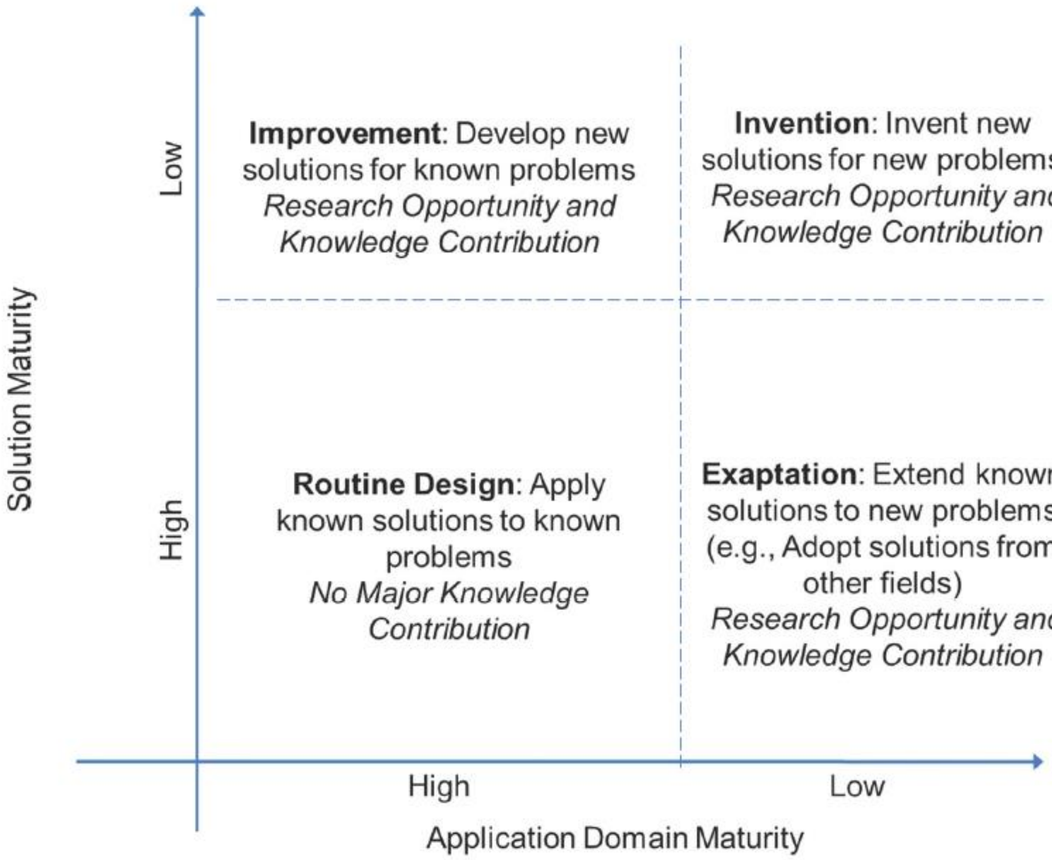

Figure 2-3: Design Science Research Knowledge Contribution Framework (source: Gregor and Hevner, 2013)

With this understanding of what constitutes DSR contributions, the implications for this study are outlined next.

Implications for this Study

For this study, the understanding is that the major contributions will be in the form of the artefact(s) that are built. However, it is clear from Hevner et al. (2004), Hevner (2007), and Gregor and Hevner (2013) that DSR contributions must be made to both practice and the knowledge base, and that these contributions can come in different forms other than just the artefact(s) itself, such as experience gained conducting the research, and any extensions to theories or methods used. However, in the IS literature, it is evident that most often the contributions are in the form of an artefact(s). For example, *"the major contribution of this research is the development of a new set of artefacts"* (Oetzel and Spiekermann, 2014, p.142); *"The systems development methodology is the major contribution of the project."* (Arnott, 2006, p.73); "*the major contribution of this research is the development of a new set of artifacts designed to help IT practitioners and researchers make sense of the IT landscape and identify, analyze, and predict technological trends."* (Adomavicius et al., 2008, p.803); and *"Our main contributions are a design approach for culturally adaptive UIs, the introduction of different artifacts that support the implementation, and an evaluation of how well the resulting UIs fit users' own design choices"* (Reinecke and Bernstein, 2013, p.449). Further to these DSR contributions, it is also understood that contributions can be made to DSR, such as process models that can be used to produce and present DSR (Peffers et al., 2007; Kuechler and Vaishnavi, 2008).

Further, just as Gregor and Hevner (2013) examined a sample of DSR articles to classify them into the framework in Figure 2-3, a similar approach was taken to classify the sample of DSR articles that have been used in this study. Table 2-5 shows the results of this classification process and the evidence for the placement of the contribution in one of the four quadrants. The same results were observed, where four of the six articles fell into the "Improvement" quadrant, while only two were in the "Exaptation" quadrant. Also, in terms of the contribution types in Figure 2-2, 4 of the articles made contributions at Level 1, in terms of instantiations of their artefact(s) (Arnott, 2006; Adomavicius et al., 2008; Abbasi et al., 2012; Oetzel and Spiekermann, 2014). All 6 of the articles made contributions at Level 2, in the form of an artefact(s). None of the articles made contributions at Level 3, design theories.

This confirms that both of the frameworks offered by Gregor and Hevner (2013) can be utilised to both justify, and position, DSR contributions to the knowledge base, and will be done so for this study.

Knowledge Contribution	Article	Knowledge Contribution Claims
Improvement	MetaFraud - A Meta-Learning Framework for Detecting Financial Fraud (Abbasi et al., 2012)	*Our research objective for this study was to develop a BI framework that detected fraud from publicly available financial information with demonstratively* ***better performance than that obtained by existing methods*** *(p. 1323).*
Improvement	Making Sense of Technology Trends in the Information Technology Landscape: A Design Science Approach (Adomavicius et al., 2008)	***We extend prior work in this research stream*** *by going beyond the typical use of ecosystems merely as an analogy and developing a new set of analytical tools that aid practitioners in evaluating technological change (p. 780)*
Exaptation	Cognitive Biases and Decision Support Systems Development: A Design Science Approach (Arnott, 2006)	*This paper reports a design science project that attempts to provide guidance to analysts developing a DSS.* ***It grounds this guidance in an important part of behavioural decision theory*** *– the theory of cognitive bias (p. 56).*
Improvement	Educating Reflective Enterprise Systems Practitioners: A Design Research Study of the Iterative Building of a Teaching Framework (Hustad and Olsen, 2014)	*We are therefore* ***extending the research application*** *context of ADR to include development of artefacts other than IT systems only (p. 469).*
Improvement	A Design Approach for Collaboration Processes: A Multimethod Design Science Study in Collaboration Engineering (Kolfschoten and De Vreede, 2009)	*The approach presented in this paper is based on existing IS design approaches and on* ***best practices from the collaboration engineering field*** *(p.227)*
Exaptation	A Systematic Methodology for Privacy Impact Assessments: A Design Science Approach (Oetzel and Spiekermann, 2014)	*We extend prior work in this research area* ***by transferring experiences and concepts from security risk assessments*** *to the privacy domain (p. 127).*

Table 2-5: DSR Articles Classified by Knowledge Contribution Types (extension: Gregor and Hevner, 2013)

With this understanding of what a DSR contribution is, an understanding of what constitutes theory in DSR is presented next.

2.3.4 What Constitutes Theory in IS Design Science Research?

Theory in IS DSR research has a varied mix of inclusion and exclusion, depending on the approach taken (Venable, 2006). What makes understanding theory in IS DSR even more convoluted, is the different meanings that the IS discipline already attaches to the term *"theory"* (Gregor and Jones, 2007; Kuechler and Vaishnavi, 2008). Outside of the IS discipline, DSR is more of a theory-discovery approach, where new theories are discovered by making *"stuff to fix problems"* (Baskerville, 2008, p.442). In IS DSR, there is much debate in terms of the nature and necessity for a design theory when conducting DSR (Baskerville, 2008).

The type of theory that DSR builds is referred to as design theory (Kuechler and Vaishnavi, 2008; Baskerville et al., 2011; Gregor and Hevner, 2013; Gregory and Muntermann, 2014), which is the fifth of five types in the taxonomy of IS theory as outlined by Gregor (2006). Gregor (2006, p.620) defines it as *"the theory gives explicit prescriptions (e.g. methods, techniques, principles, of form and function) for constructing an artifact."* So design theory gives explicit prescriptions on how to design and develop an artefact (Walls et al., 1992; Gregor and Jones, 2007; Gregor and Hevner, 2013), as opposed to descriptive theories that the other types of IS research builds (Gregor and Hevner, 2013).

Further to this, Gregor and Jones (2007, p.314) understand theory to encompass *"conjectures, models, frameworks, or bodies of knowledge"*, while Nunamaker et al. (1990, p.94) sees theory building as the *"development of new ideas and concepts, and construction of conceptual frameworks, new methods, or models"*. This would indicate that three of the four types of DSR artefacts that Hevner et al. (2004) introduces; constructs, models, and methods, are each components of theory (Gregor and Jones, 2007). Therefore, when research produces these artefacts, it is theory building.

However, while Hevner et al. (2004) remain unclear in what theory is to DSR (Venable, 2006), in a later article, Hevner (2007) is much more explicit. While he does acknowledge that part of DSR rigor involves searching for kernel theories, which are descriptive theories that come from other fields (Gregor and Jones, 2007; Kuechler and Vaishnavi, 2008), it is not essential (Hevner, 2007). Further, it is unrealistic to suggest that all DSR needs to be grounded on descriptive theories, and trying to achieve this can potentially harm the paradigm (Hevner, 2007). Instead, several different sources of ideas for the grounding of DSR should be used *"including rich opportunities/problems (from the relevance cycle), existing artifacts, analogies/metaphors, and theories"* (Hevner, 2007, p.90).

This is further elaborated in the Gregor and Hevner (2013) article, where a much greater effort is made to try and explain what design theory is to DSR. Their research contribution framework, already introduced Figure 2-2, allows researchers to distinguish between their different DSR outputs. This framework has three contribution levels, where contributions can be attributed to one or more of these levels (Gregor and Hevner, 2013). Each of these levels are defined as *"ranging from specific instantiations at Level 1 in the form of products and processes, to more general (i.e. abstract) contributions at Level 2 in the form of nascent design theory (e.g. constructs, design principles, models, methods, technological rules), to well-developed design theories about the phenomena under study at Level 3"* (Gregor and Hevner, 2013, p.341). Each of these levels are seen as *"steps in the process of developing more comprehensive bodies of knowledge or design theories"* (Gregor and Hevner, 2013, p.341). Therefore, not all DSR is going to produce well developed design theory, but in many instances it is going to create nascent design theory, that over time could potentially develop into design theories. With this understanding of what constitutes theory in IS DSR, the implications for this study are outlined next.

Implications for this Study

For this study, the understanding is that the design science research paradigm is still unsure if theory is actually necessary to be considered DSR, but kernel theories can be used to inform the research (Kuechler and Vaishnavi, 2008) as well as other sources such as the knowledge base. The knowledge that is created through conducting DSR can be considered theory building, especially if it is building artefacts such as constructs, models, and/or methods, as these are all components of theory, and this can be referred to as nascent design theory (Level 2). However, the success of the design science research *"is predicated on the researcher's skilled selection of appropriate techniques to develop or construct a theory or artifact and the selection of appropriate means"* (Hevner, 2007, p.90). In the IS literature, examples of research using kernel theories to develop artefacts include Adomavicius et al. (2008, p.781) who *"use existing theory on technology evolution and IT innovation and use a process theory approach to guide the design of the constructs upon which we formulate and develop our proposed tools."*, as well as Reinecke and Bernstein (2013, p.434) where *"Building on this theory, we developed several artifacts to support cultural adaptivity and, where possible, evaluated alternatives of major design decisions."*. Examples of DSR that uses other sources includes Oetzel and Spiekermann (2014, p.127) where *"The PIA methodology we present is based on a critical review of existing constructs and procedures."*, and Kolfschoten and De Vreede (2009, p.1) where they *"developed a design approach for Collaboration Engineering that incorporates existing process design methods, pattern based design principles, and insights from expert facilitators regarding design challenges and choices."*. Having now answered each of the common questions about DSR, as well as explicitly stating how each one is understood for this research, the next section introduces an IS DSR process model to structure the DSR approach to ensure contributions are achieved. This model is adopted for this study thereafter.

2.4 Building an IS Design Science Research Process Model

Several process models for conducting DSR have been constructed in the IS literature, such as March and Smith (1995), Rossi and Sein (2003), and Peffers et al. (2006). Presented in Table 2-6 are five of these process models from the IS literature dating from 1990 to 2008. Despite these models appearing over such a span of time, they have remained somewhat similar. For example it is evident that most of these models contain the same or similar steps but have different naming conventions, i.e. Rossi and Sein (2003) suggest that DSR should start by *"Identifying a Need"*, while Peffers et al. (2006) suggest it should start with *"Problem Identification and Motivation"*. Some of the models also have extra steps such as March and Smith (1995) *"Justify"*, and Peffers et al. (2007) *"Demonstration"*. So while the process models share similarities, none of them are identical, which can lead to confusion for researchers who wish to conduct DSR, as it is not obvious which one is the most appropriate for the research they wish to conduct (Peffers et al., 2007).

Reference	**Design Science Research Process Models**								
Nunamaker et al. (1990)	1. Construct a Conceptual Framework	2. Develop a System Architecture	3. Analyse and Design the System	4. Build the System		5. Observe and Evaluate the System			
March and Smith (1995)				1. Build		2. Evaluate	3. Theorise	4. Justify	
Rossi and Sein (2003)	1. Identify a Need			2. Build		3. Evaluate	4. Learn and Theorize		
Peffers et al. (2007)	1. Problem Identification and Motivation	2. Objective of a Solution	3. Design and Develop		4. Demonstration	5. Evaluation			6. Communication
Kuechler and Vaishnavi (2008)	1. Awareness of Problem	2. Suggestion		3. Development		4. Evaluation			5. Conclusion
This Study	**1. Problem Identification**	**2. Objective(s) of a Solution**	**3. Design and Build**		**4. Evaluate**		**5. Research Contributions**		**6. Communicate Research**

Table 2-6: IS Design Science Research Process Models

To address this confusion, within this study, a process model has been developed from the consistent process elements that occur across the five process models presented in Table 2-6. For example, Peffers et al. (2007) created their process model for doing DSR based on process models from engineering, IS, and other disciplines – a similar approach has been taken here but with the focus on IS DSR process models, thus creating an IS DSR process model. Also, Peffers et al. (2007) use the term *"Activity"* when describing the stages of a process model, which helps describe that something must be done in each stage, so the word is adopted for each step of the new model. To develop such a process model, each process element from all five of the process models were read, interpreted, and understood. From these interpretations it was evident that some process elements had similar understandings and should be merged to create one single step. An example of this is the activity *"Evaluate"*, where across the five process models, a process element of evaluate exists, but Nunamaker et al. (1990) state it as *"Observe and Evaluate the System"*, but from their explanation of it, it can be interpreted as *"Evaluate"*.

The seven DSR guidelines by Hevner et al. (2004) are also utilised in this process model, as they provide the explanations for what needs to be done in each step of the model. These guidelines were read, and interpreted, and from the understanding that was formed they were mapped to each step in the process model, i.e. the most appropriate guideline for *"Activity 1: Identify a Problem"* is *"Guideline 2: Problem Relevance"*. This step is important because the guidelines are currently not presented in a linear way by Hevner et al. (2004), i.e. *"Guideline 3: Design Evaluation"* is stated before *"Guideline 6: Design as a Search Process"* but in reality evaluation cannot occur before an artefact is actually designed and built. This helps ensure that when conducting DSR with this process model, researchers do not need to just rely on their understanding of each activity, but there is in fact guidance provided on how each activity should be completed, which ensures rigor. Next we present an explanation of how each activity was formed, then each one is explained, and finally a guideline is applied to each activity.

2.4.1 Explanation of the Design Science Research Methodology

Presented in Table 2-7 is an overview of each activity that must be completed to conduct DSR, and the seven guideline from Hevner et al. (2004) mapped to each activity to provide guidance on how best to apply each one. A more detailed explanation of each of these activities is presented in the following sections.

Activity	Explanation	Guideline
1. Problem Identification	Identifying a problem involves recognizing a deficiency in a current system and then justifying the value of finding a solution to this problem.	G2: Problem Relevance
2. Objective(s) of a Solution	Stating the objective(s) for the research is necessary to provide focus, and should be inferred from the problem definition.	
3. Design and Build	Designing and building an artefact involves moving from the research objectives and actually demonstrating that it is feasible to build such an artefact.	G1: Design as an Artefact G5: Research Rigor G6: Design as a Search Process
4. Evaluate	Evaluation involves Once an artefact has been built, the researcher must evaluate its utility by comparing the objectives of the solution to actual observed results from the use of the artefact in its intended environment.	G3: Design Evaluation
5. Research Contributions	Justifying the contributions of the research is achieved by showing the artefact being utilised in the practical environment in which it was developed for, as well as stating the contributions that are made to the knowledge base.	G4: Research Contributions
6. Communicate Research	It is necessary to communicate the resulting knowledge from the research to both practice and academia.	G7: Communication of Research

Table 2-7: Activities and Guidelines of an IS Design Science Research Process Model

2.4.1.1 Activity 1: Problem Identification

Out of the five process models reviewed, four have explicitly stated that identifying a problem to be solved is necessary (Nunamaker et al., 1990; Rossi and Sein, 2003; Peffers et al., 2007; Kuechler and Vaishnavi, 2008). While not explicitly stated in their process model, March and Smith (1995) also advocates the need for identifying a problem to be solved before building an artefact. The label that best describes this activity was identified as *"Problem Identification"*.

Activity 1

Identifying a relevant problem to practice involves recognising a deficiency in a current system and then justifying the value of finding a solution to this problem. Ideally, the research problem should be new, creative, and the solution should be important to the field. Once the problem has been identified, a thorough search of previous research on the topic should be performed. By clearly defining the research problem, a focus for the research is created.

Guideline 2: Problem Relevance

From the seven guidelines suggested by Hevner et al. (2004), it is Guideline 2 that is best applied to complete this activity. It states that DSR should address important and relevant problems, where a problem is the *"difference between a goal state and the current state of the system"* (Hevner et al., 2004, p.85). Further to this, the problem that is being addressed needs to be relevant to practice, so researchers should address *"unsolved and important business problems."* (Hevner et al., 2004, p.84).

2.4.1.2 Activity 2: Objective(s) of a Solution

Three of the five process models indicate the need to set objectives for the solution that is going to be built (Nunamaker et al., 1990; Peffers et al., 2007; Kuechler and Vaishnavi, 2008). For example Nunamaker et al. (1990, p.99) has the process element *"Develop a System Architecture"* which as a label does not relate to setting objectives as an activity, but on further reading of what the activity entails, it clearly highlights *"...state the objectives of the development efforts (i.e. the focus of the research), and define the functionalities of the resulting system to achieve the stated objectives"*. The label that best describes this activity was identified as*: "Objective(s) of a Solution"*.

Activity 2

Stating the objective(s) for the research is necessary to provide focus. The objective(s) should be inferred from the problem definition, while also stating what is possible and feasible. This objective(s) will eventually act as the metrics at the evaluation stage, when the artefact will be judged to have achieved its intended goal of solving the identified problem. When stating the objective(s), they can be in quantitative terms (where a desirable solution would be better than current ones), or qualitative (description of how a new artefact is expected to support solutions to problems not hitherto addressed).

2.4.1.3 Activity 3: Design and Build

Interestingly, while all the process models focus on one of the core DSR principles of *build*, only two of them first focus on the element of *design*. For example, Nunamaker et al. (1990) have a dedicated process element titled *"Analyse and Design a System"*, which focuses on designing the intended artefact, while Peffers et al. (2007) also have a process element for design. Some researchers also use the label *develop* rather than *build* (Peffers et al., 2007; Kuechler and Vaishnavi, 2008), but the explanation of the process is still very similar. As the majority of process models use the term *build*, the label that best describes this process element was identified as *"Design and Build"*.

Activity 3

Designing and building an artefact involves moving from the research objectives and actually demonstrating that it is feasible to build such an artefact. The design involves understanding the studied domain, and applying relevant scientific and technical knowledge, while the build refers to the construction of the artefact (constructs, models, methods, and instantiations) based on this knowledge, demonstrating such an artefact can be constructed.

Guideline 1: Design as an Artefact

Hevner et al. (2004) assert that the result of DSR must be a viable artefact in the form of a construct, model, method, and/or an instantiation, which addresses an important organizational problem. These artefacts should address the problems in unique or innovative ways, or improve on how things are currently achieved (Hevner et al., 2004). What differentiates DSR and routine design is *"the clear identification of a contribution to the archival knowledge base of foundations and methodologies"* (Hevner et al., 2004, p.81).

Guideline 5: Research Rigor

When setting the objective(s) for a solution, Hevner et al. (2004) assert that there is a need to effectively use the knowledge base to ensure research rigor. This requires researchers to acquire knowledge on current solutions, theoretical foundations, and research methodologies that are appropriate to the problem area. Success depends on the researcher's ability to select the appropriate techniques and means in which to construct and evaluate the artefact. Experience plays a crucial role in getting these selections right.

Guideline 6: Design as a Search Process

Since DSR is concerned with finding an effective solution to a problem, design can be viewed as a search process to discover a solution through an iterative process (Hevner et al., 2004). The design task involves *"the creation, utilization, and assessment of heuristic search strategies"* (Hevner et al., 2004, p.89) where the aim is to construct an artefact that *"works"* well for the stated problem. This is achieved by *"utilizing available means to reach desired ends while satisfying laws in the problem environment"* (Hevner et al., 2004, p.88).

2.4.1.4 Activity 4: Evaluate

The activity of *Design and Build* is followed by the need to evaluate the artefact, and this is another core DSR principle that all the process models have (Nunamaker et al., 1990; March and Smith, 1995; Rossi and Sein, 2003; Peffers et al., 2007; Kuechler and Vaishnavi, 2008). This evaluation should then provide feedback into a possible redesign from what has been discovered, and this iteration continues until there are no more apparent improvements occurring, i.e. the artefact is ready for the real world, or the researcher leaves further improvements for future research. Peffers et al. (2007, p.55) then suggest another process element titled *"Demonstration"*, where the researcher must *“demonstrate the use of the artifact to solve one or more instances of the problem”*, but it is believed that this already occurs in the *“Evaluation”* activity. That is to say that the researcher must evaluate how well the artefact supports a solution to the problem that has been identified, i.e. demonstrate its utility. As all the process models use the label *“Evaluate”*, it is evident it best describes this process element.

Activity 4

Once an artefact has been built, the researcher must evaluate its utility by comparing the objectives of the solution from *“Activity 2: Objective(s) of a Solution”*, to actual observed results from the use of the artefact in its intended environment. These objectives therefore act as the metrics, which define whether the artefact has achieved its intended goal of solving its identified problem, or not. This evaluation can be done in many ways, such as experiments, observations, or field studies, and is dependent on the problem environment and the artefact itself. It is also an iterative step, where the researchers can decide to take the lessons learned in the *evaluation* activity and return to the *design and develop* activity to improve the artefact. Alternatively, they can move onto the next activity and leave further improvements for future research. Crucially, if the metrics used to measure the artefact are weak, or there is a failure to measure the artefact’s performance with these metrics, there is great difficulty in judging research contributions.

Guideline 3: Design Evaluation

IT artefacts can be evaluated in terms of *“functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes”* (Hevner et al., 2004, p.85). To achieve this, the developed artefact needs to be rigorously demonstrated by evaluating it with well-established design evaluation methods such as observations; analysis; experiments; testing; and/or descriptions. Selecting the right method to evaluate the artefact is critical, and should be matched appropriately with the evaluation metrics in mind. The evaluation phase can provide essential feedback for the *Design and Build* activity *“as to the quality of the design process and the design product under development”* (Hevner et al., 2004, p.85). An artefact can be considered complete when *"it satisfies the requirements and constraints of the problem it was meant to solve"* (Hevner et al., 2004, p.85).

2.4.1.5 Activity 5: Justify Contributions

Two of the process models introduce the process elements of *"Theorize"* (March and Smith, 1995) and *"Learn and Theorize"* (Rossi and Sein, 2003). March and Smith (1995) then follow up their process element with another, *"Justify"*. None of the other process models have activities that relate to these. However, in DSR, these elements can be considered under the broader term of *"Contributions"*, where Hevner (2007) indicates that DSR needs to justify its contributions to both practice and academia. This is an important element, and proves that some contributions have been made, and therefore the research has both achieved its intended objectives and made contributions. The label that best describes this process element was identified as *"Justify Contributions"*.

Activity 5

Gregor and Hevner (2013, p.342) identify three levels at which contributions can be justified: Level 1. Situated implementation of an artefact; Level 2. Nascent design theory – knowledge as operational principles/architecture; Level 3. Well-developed theory about embedded phenomena. Contributions can be justified across one or more of these levels, where Level 1 can be justified with instantiations of an artefact(s); Level 2 is justified by the design, build, and evaluation of an artefact(s); and Level 3 is justified by creating design theories (mid-range and grand theories). These contributions can then include any extensions to original theories, and/or methods used during the research, new design products and processes, and also any experiences gained from performing the research. This provides justification for the research that has been done.

Guideline 4: Research Contributions

The contributions of the research must then be presented in the areas of the design artefact, design foundations, and/or design methodologies (Hevner et al., 2004). The design artefact is often a contribution of the research (to both practice and academia), and can extend the knowledge base, or use existing knowledge in new ways (Hevner et al., 2004). According to Hevner et al. (2004) other important contributions come from "*the creative development of novel, appropriately evaluated constructs, models, methods, or instantiations that extend and improve the existing foundations in the design-science knowledge base"* (Hevner et al., 2004, p.87). Finally, contributions can also be made in terms of methodologies, where *"the creative development and use of evaluation methods (e.g. experimental, analytical, observational, testing, and descriptive) and new evaluation metrics provide design-science research contributions"* (Hevner et al., 2004, p.87).

2.4.1.6 Activity 6: Communicate

Lastly, once the work is completed it is important to share the knowledge that has been acquired. This is a process element that two of the process models incorporate (Peffers et al., 2007; Kuechler and Vaishnavi, 2008). It's achieved by communicating to others through different avenues such as publications in both academic and practitioner outlets, presenting the work at conferences, and through discussions. The label that best describes this process element was identified as *"Communicate"*.

Activity 6

It is necessary to communicate the resulting knowledge from the research. This is achieved by communicating *"the problem and its importance, the artifact, its utility and novelty, the rigor of the design, and its effectiveness to researchers and other relevant audiences such as practicing professionals, when appropriate"* (Peffers et al., 2007, p.56). It is only when this knowledge is disseminated that other researchers and practitioners can begin to benefit from the research effort, otherwise it will go unnoticed.

Guideline 7: Communication of Research

Hevner et al. (2004) assert that the DSR should be presented effectively to both a technology-orientated audience (practitioners and researchers), as well a management-orientated audience (practitioners). That is to say when conveying the research to a technology-orientated audience, sufficient detail is needed to *"enable the described artifact to be constructed (implemented) and used within an appropriate organizational context"*, thus *"allowing practitioners to take advantage* *of the benefits offered by the artifact, as well as allowing researchers to build a cumulative knowledge base for further extension and evaluation"* (Hevner et al., 2004, p.90). When conveying the research to a management-orientated audience, sufficient detail is needed to allow them to *"determine if the organizational resources should be committed to constructing (or purchasing) and using the artifact within their specific organizational context"* (Hevner et al., 2004, p.90).

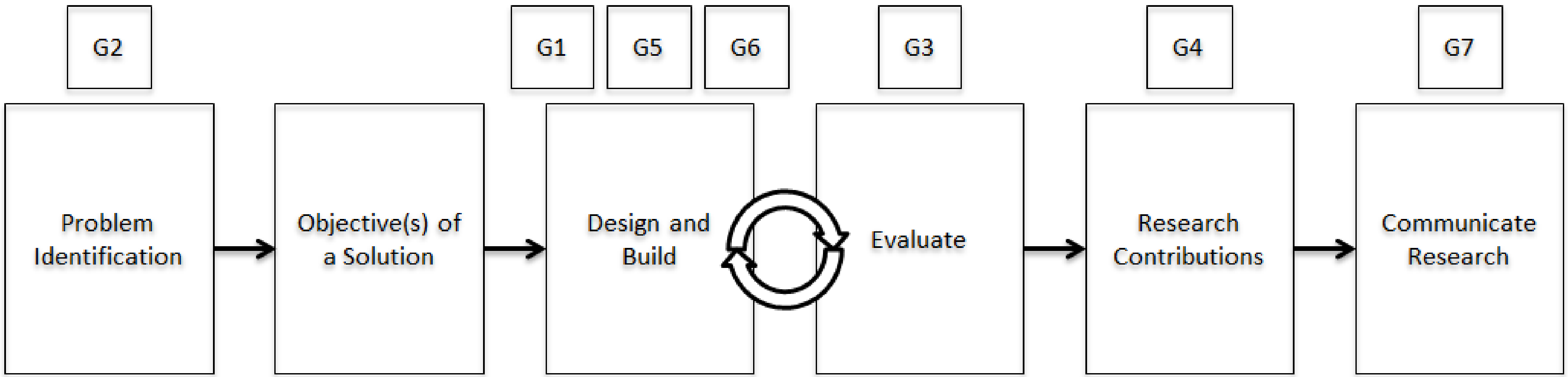

Figure 2-4: IS Design Science Research Process Model with Hevner et al. (2004) Seven Guidelines Mapped to each Activity

2.5 Summary

The objective of this chapter was to introduce design science research (DSR), and explain its implications for this study. To achieve this, a literature review of the DSR research was conducted, where relevant articles from the AIS senior scholars' basket of (eight) journals, and the conferences of AMCIS, ICIS, and ECIS, were consumed. This helped explain the DSR paradigm from an IS perspective, where a number of questions that are often asked about it, were answered. These questions included what constitutes IS DSR research; what constitutes a DSR artefact; what constitutes a DSR contribution; and what constitutes theory in IS DSR? Further to this, under each of these questions, an explanation of the implications for this study was provided.

Following this, another question that is often asked was identified; what is a relevant process model that can be applied to ensure high quality DSR? To answer this, such an IS DSR process model was constructed from reviewing the different models that currently exist in the IS literature. From five process models that were identified, the consistent process elements that occurred across them were aligned into the IS DSR process model for this research. Each of these process elements were explained, and the guidelines for conducting DSR that Hevner et al. (2004) provided were mapped on to each element that it could help guide. This provides the research approach that this study will follow in identifying a relevant problem to be solved, setting the objective to achieve a solution, designing, building, and evaluating an artefact to solve such a problem, before the contributions are justified, and the research is communicated. It is also used to provide the headings for the chapters in this thesis, and thus the next section is used to identify a problem.

Chapter 3 Problem Identification

3.1 Introduction

The purpose of this chapter is to identify a relevant problem to practice that needs to be solved, which is the first activity of the IS DSR process model being followed in this research. The relevance of IS research to practice is considered an old problem in the field (Benbasat and Zmud, 1999; Davenport and Markus, 1999; Agarwal and Lucas Jr, 2005; Straub and Ang, 2008; Gill and Bhattacherjee, 2009), where Davenport and Markus (1999) agreed with Benbasat and Zmud (1999), and made a call that IS research needed to become more relevant for the long-term survival of the field, but this does not appear to have been acknowledged, as still, IS research often fails to inform practitioners (Agarwal and Lucas Jr, 2005; Gill and Bhattacherjee, 2009; Siponen and Vance, 2014). Further to this, Klein and Rowe (2008, p.675) echoed Davenport and Markus' call, by stating *"One of the major challenges facing the field of MIS today is to become more practically relevant so that it can better serve its business and public sector stakeholders"*. Therefore it is understood that there is a need for IS research to be relevant, where the research must not only focus on an interesting topic, but more importantly focus on a topic that practitioners will benefit from.

To achieve this, IS researchers should look to practice to identify a topic to research, and then look at the academic literature available to understand it (Benbasat and Zmud, 1999). Despite IS academics devaluing practitioner outlets such as Harvard Business Review (HBR) and Sloan Management Review (SMR), these are outlets that practitioners do value (Davenport and Markus, 1999), and by reading their articles, current trends can be highlighted, with the likely outcome of producing more topical and valued ideas (Hair et al., 2007). This was the approach used to identify a relevant topic for this study, where practitioner outlets such as HBR and SMR, which offer daily blog posts, as well as Cutter Consortium articles, were reviewed on a weekly basis, identifying the current trends of practice. A topic that had been receiving constant attention was that of social media (Armano, 2009b; Armano, 2009a; Baker, 2009; Deragon, 2009; Reid, 2009; Soat, 2010) ranging from its application in organisations, to its potential for government use, and it's potential for learning. It was evident from these trends that social media was more than a buzzword, but in fact an emerging, and relevant topic for practitioners.

While social media was therefore deemed a relevant topic, on its own it is too broad to research, so as is necessary with DSR, a relevant problem must be identified, which helps focus the research on an area that practitioners can benefit from. Identifying such a relevant problem to practice involves recognising a deficiency in a current system and then justifying the value of finding a solution to this problem (Hevner et al., 2004; Hevner, 2007). Ideally, the research problem should be new, creative, and the solution should be important to the field (Hevner et al., 2004; Hevner, 2007). Once the problem has been identified, a thorough search of previous research on the topic should be performed (Hevner et al., 2004; Hevner, 2007). By clearly defining the research problem, a focus for the research is created (Hevner et al., 2004; Hevner, 2007; Peffers et al., 2007).

The remainder of the chapter is thus organised as follows. A relevant problem is identified by first focusing on collaborative technologies and their proclaimed impact on the learning environments of educational institutions by changing, and possibly improving, the pedagogical approach from a traditional learning approach, to a collaborative learning approach, which have been evident for more than twenty years in the IS literature. From this, it is understood that the same claims are being made in terms of social media, a new collaborative technology, where the impact again comes in the form of changing from a traditional learning approach, to a collaborative learning approach. However, in the IS research community, there is still a lack of understanding of the impact that social media has on the learning environment. Thus, a relevant problem to practice is stated as *"There is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning environments"*.

Following the identification of this problem, a thorough search of previous research on the topics of social media and collaborative learning are performed. The methodology for conducting this literature review is introduced. From this literature review, an overview of social media in IS research is produced, with a definition also provided. Then, an overview of collaborative learning is provided, where a definition is stated, including an explanation of what a collaborative learning environment. Lastly, to be able to solve the problem that has been stated, the next DSR activity is introduced, where the objective of a solution is stated. This involves inferring the objective from the problem statement, and also providing two research questions to help achieve this objective. The final section concludes with a summary of the chapter. First, the identification of the problem that must be solved is introduced in the next section.

3.2 Stating the Problem

As is necessary with design science research, a relevant problem must be identified, which helps focus the research on an area that practitioners can benefit from. There are different areas that practice still have questions about, and one such area is the opportunity for them to adopt social media to enable learning (Ajjan and Hartshorne, 2008; Boateng et al., 2009; Kane and Fichman, 2009; Thongmak, 2011; Aral et al., 2013). However, while it is regarded that social media enables collaboration amongst its users (Blinn et al., 2009; Oh et al., 2010; Agarwal et al., 2011; Bharati et al., 2012; Aral et al., 2013; Kane et al., 2014), its potential to enable collaboration in the work environment requires further investigation (Aoun and Vatanasakdakul, 2012; Bharati et al., 2012), beginning with understanding what collaborative technologies are.

3.2.1 Collaborative Technologies as Enabling Learning Environments

Collaborative technologies facilitate collaboration through electronic means, and have become important components of day-to-day life (Brown et al., 2010), where successful collaboration is the process through which a specific outcome is achieved through a group effort (Kotlarsky and Oshri, 2005). A number of terms have been used to describe collaborative technologies across academic studies, including group decision support systems (GDSS) (Watson et al., 1988; Miranda and Saunders, 2003), group support systems (GSS) (Alavi, 1994; Finnegan and O'Mahony, 1996; Mejias et al., 1997; Griffith et al., 1998; Alavi et al., 2002; Kwok et al., 2002; Carte and Chidambaram, 2004; Brown et al., 2010), and groupware (Bostrom et al., 1990;

Carte and Chidambaram, 2004; Bajwa et al., 2005). Traditionally these technologies support communications, interactions, and a flow of information amongst group members, and have evolved to support these needs across different tasks, and time/distance scenarios (Bostrom et al., 1990; Carte and Chidambaram, 2004; Bajwa et al., 2005). It is therefore understood that collaborative technologies should be able to establish many-to-many interactions, help manage these interactions, and maintain logs of what has been discussed (Stahl, 2006).

Organisations have invested time and money into adopting these collaborative technologies, which have been used for a myriad of tasks, impacting different areas such as marketing, operations, finance, and human resource management. Another area they were proclaimed to impact was the learning environments of organisations, and more specifically the learning environments of educational institutions (Leidner and Jarvenpaa, 1993; Alavi, 1994; Alavi et al., 1995; Leidner and Jarvenpaa, 1995). These calls were predominantly made in the 1990s, where the IS discipline was interested in determining whether the new collaborative technologies were capable of transforming the traditional methods of teaching (Alavi, 1994; Leidner and Jarvenpaa, 1995), as evidenced by this literature being published in journals such as MISQ, and ISR. Reasons for this interest included educational institutions lack of change in their learning environments, especially in comparison to organisations adoption of such technologies (Alavi, 1994; Leidner and Jarvenpaa, 1995), lack of engaging students in the learning process, relying on the traditional method of teaching (Alavi, 1994), educators, students, and employers feeling that technology could enhance learning (Alavi, 1994), and despite IS researchers highlighting *"the merits of information technology to improve communication, efficiency, and decision making in organizations"* (Leidner and Jarvenpaa, 1995, p.265), they were not applying this knowledge to their own learning environments.

However, Leidner and Jarvenpaa (1995, p.265) found that when technology was being used in educational learning environments, it was in an automating fashion as opposed to a transforming one, where in *"the absence of fundamental changes to the teaching and learning process, such classrooms may do little but speed up ineffective processes and methods of teaching."* That is to say, rather than trying to use collaborative technologies to transform the learning environments, they were merely being used to aid the traditional method of teaching. Alavi (1994) suggested that to be able to effectively integrate these collaborative technologies into the learning environments, a shift from the traditional method of teaching was necessary, and such a shift needed to prove to be superior to the alternative modes of instruction. To test this, Alavi (1994) used a collaborative technology, namely GDSS, to enable a different learning method, namely, collaborative learning, to enable a collaborative learning environment. The design for such an environment was informed by the principles of collaborative learning, i.e. groups of 3-4 members must work together to complete a task, and in this case they must use a GDSS to do so. Findings from this study indicated that *"GDSS-supported collaborative learning leads to higher levels of perceived skill development, self-reported learning, and evaluation of classroom experience in comparison with non-GDSS supported collaborative learning. Furthermore, the final test grades of the group of students who were exposed to GDSS-supported collaborative learning were significantly higher than those of the other group of students who participated in the experiment"* (Alavi, 1994, p.159). Of course, new collaborative technologies are always emerging, and one such technology is social media, where a similar pattern of what happened 20 years ago is again emerging, and this is presented next.

3.2.2 Social Media as Enabling Learning Environments – Old Problem, New Technology

New generations of collaborative technologies often emerge (Bajwa et al., 2008), and the platforms of social media are one such technology. This is due to their popularity, availability, and increased power in recent years, as well as the ability to collaborate and share information amongst users (Kane and Fichman, 2009; Aral et al., 2013). By having the ability to respond to information that others provide (Tredinnick, 2006; Stenmark, 2008) users can participate in conversations with each other, indicative of the emerging interaction capabilities which social media has provisioned - i.e. allowing for many-to-many interactions to occur. Also, as social media are internet-based, they allow for interactions to occur at different times and distances (Neville et al., 2005). Further, social media allow for content to accumulate over time, where a collective knowledge is built up (Stenmark, 2008), thus keeping a log of what is being discussed. It is therefore evident that social media can be seen as a collaborative technology, as they fit the criteria that have been deemed fit for the purpose: they support communication and interactions amongst their users, allowing information to flow at different time/distance scenarios, and logs of what have been discussed are maintained. Similar to other collaborative technologies, they are impacting different areas of organisations, who are again investing time and money in them, such as marketing, operations, finance, and human resource management (Aral et al., 2013).

Also, in a similar fashion to previous collaborative technologies, social media have been proclaimed as impacting the learning environments of the future (Ajjan and Hartshorne, 2008; Kane and Fichman, 2009; Zhang, 2012). Organisations are very interested in how social media will impact their own learning environments (Meister and Willyerd, 2010), as they are constantly changing (Xu et al., 2005; Wang, 2009; Meister and Willyerd, 2010), especially educational institutions, where it is proclaimed that social media could impact their learning environments through better communication and collaboration, in new and exciting ways (Ajjan and Hartshorne, 2008; Kane and Fichman, 2009; Ebner et al., 2010; Zhang, 2012).

However, just like before, the very same issues can be observed. For example, the learning environments of educational institutions have seen little change in the past 20 years, especially in comparison to organisations adoption of such technologies, where there is still a lack of engaging students in the learning process, relying on the traditional method of teaching (Kane and Fichman, 2009; Zhang, 2012; Hustad and Olsen, 2014). Further educators, students, and employers, believe that technology enabled learning environments will enhance learning (Chen et al., 2008; Tan et al., 2011). The IS discipline has also focused much research on social media in terms of their impact on organisations, but have failed to discuss it in terms of how this knowledge could influence their own practice, especially in terms of teaching (Kane and Fichman, 2009), i.e. to our own learning environments. All these statements echo what was being said 20 years ago, but the collaborative technology that is being discussed has changed. However, there is a major difference between these technologies, and that is that social media are a grassroots collaborative technology, where the majority of learners have experience of using them in their daily lives, as opposed to the GDSS that Alavi (1994) used, where it was a relatively new technology to the learners, and classes had to be dedicated to showing students how to use them.

With learners, mainly from the millennials (born 1977-1997), and generation 2020 (born after 1997), used to these technologies in their personal lives, it is unsurprising that there are calls for them to be adopted into the learning environments of which these generations are/will be a part of (Chen et al., 2008; Guo et al., 2009; Chen et al., 2010; Tan et al., 2011). It is argued that by utilising the technologies they are used to, it may encourage more engagement, and prepare them for the work environments that are also embracing these technologies (Tan et al., 2011). However, in the IS research community, there is still a lack of understanding of the impact that social media has on the learning environment, and by not addressing this issue it could mean *"IS instructors and scholars might no longer connect to, let alone well educate, these future IS professionals that would soon become a major information technology (IT) workforce and significantly shape and reshape our professional community worldwide."* (Chen et al., 2008, p.2). So if we wish to influence the future IS professionals, we are required to rethink how social media can *"increase the value of and/or decrease the effort required to manage the learning environment"* (Kane and Fichman, 2009, p.12).

However, introducing social media into the learning environment is not such a simple task, and should not be done just for the sake of it (Kane and Fichman, 2009). Educators need to consider the learning models that best suit the platforms to enable learning to occur (Alavi, 1994; Leidner and Jarvenpaa, 1995; Chen et al., 2008). As shown in Table 3-1, there are a number of learning models available, but the IS literature currently lacks evidence on what one social media might enable. For example, it has been observed that social media has been used to enhance the current traditional method of teaching, where a blog was used as a tool to allow learners to communicate with the instructor through learners leaving comments on a blog post that contains the course slides, where they could ask questions about particular content in the slides. It was also observed that social media was used as a Q&A tool, where learners could ask questions via Twitter as a class was being conducted, and at the end of the class, the instructor would answer the questions that were asked. However, in these instances, social media is only being used to enhance traditional methods of teaching, as Leidner and Jarvenpaa (1995) alluded to with other collaborative technologies, which has often been criticised as generating passive students (Vygotsky and Cole, 1978; Lave and Wenger, 1991).

Instead, Alavi (1994) suggests that actively engaging learners in the learning process is preferred to the traditional method of teaching, where it generates more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners (Leidner and Jarvenpaa, 1995; Zhang, 2012; Hustad and Olsen, 2014). So it is argued that it is necessary to reengineer the current traditional approach of learning, to a collaborative learning approach (Kirschner, 2001) as a collaborative technology may be better suited to enabling such a learning environment (Alavi, 1994; Leidner and Jarvenpaa, 1995; Kane and Fichman, 2009; Zhang, 2012; Hustad and Olsen, 2014).

Model	Explanation
The Objectivist Model of Learning	Leidner and Jarvenpaa (1995, p.266) states *"the objectivist model of learning is based on Skinner's stimulus-response theory: learning is a change in the behavioural disposition of an organism that can be shaped by selective reinforcement".* It is believed that there is an objective reality, where knowledge exists outside the mind of individuals (Moallem, 2001). The goal is to then transfer this knowledge from the instructor to the learner, so this model of learning is most appropriate for factual or procedure-based learning (Leidner and Jarvenpaa, 1995).
The Constructivist Model of Learning	*"Constructivism is a learning theory where individuals construct meaning from their own current knowledge"* (Wurst et al., 2008, p.1767). It is denied that an external reality exists outside an individual's mind (Leidner and Jarvenpaa, 1995; Karagiorgi and Symeou, 2005). Instead, each learner's experiences and biases are different, as they form their own opinions on what is going on around them (Leidner and Jarvenpaa, 1995; Wurst et al., 2008). With this model it is believed that students learn better when they have to discover for themselves by interacting with objects themselves, rather than being (Leidner and Jarvenpaa, 1995; Wurst et al., 2008). The teacher merely serves as a mediator, and provides s for students during class to help learners construct their own views of reality (Leidner and Jarvenpaa, 1995).
The Collaborative Model of Learning	A derivative of the constructivist model of learning is the collaborative model of learning (Alavi, 1994; Leidner and Jarvenpaa, 1995). The main difference between the two models is that constructivist learning is assumed to occur at the individual level as they interact with objects, whereas collaborative learning emerges through interactions between individuals (Slavin, 1990). Therefore learning can be seen as occurring when individuals exercise, verify, solidify, and improve their mental models through discussions and information sharing (Alavi, 1994; Leidner and Jarvenpaa, 1995).
The Cognitive Information Processing Model of Learning	Another derivative of the constructivist model of learning, cognitive information processing focuses on cognitive processes used in learning (Leidner and Jarvenpaa, 1995). The student controls the pace of the learning, based on the frequency and intensity with which they cognitively process the instructional input (Leidner and Jarvenpaa, 1995).
The Sociocultural Model of Learning	The sociocultural model of learning is viewed both as an extension, and a reaction to the constructivist model of learning (Leidner and Jarvenpaa, 1995). Socioculturalists believe that there is no one external reality; they feel constructivism and collaborativism force the minority into adopting the understanding of the majority (Leidner and Jarvenpaa, 1995). Further to this, instruction cannot *"deliver a single interpretation of reality nor a culturally biased interpretation of reality"* (Leidner and Jarvenpaa, 1995, p.269).

Table 3-1: Models of Learning

3.2.3 Problem Statement

The call for technology to be used in educational institutions is not a new one, and over the years we have seen many technologies introduced into their learning environments. For example e-mail, course websites, and newsgroups have added value to the traditional learning environment (Ajjan and Hartshorne, 2008), but have been used to aid the traditional learning approach, rather than trying to change or improve it (Leidner and Jarvenpaa, 1995). Another type of technology, namely collaborative technologies, were proclaimed as being able to impact the learning environments of educational institutions by changing, and possibly improving, the pedagogical approach. This impact comes in the form of changing from a traditional learning approach, to a collaborative learning approach, but it is evident that this has not been widely adopted. Instead the traditional approach is still the most dominant approach to learning in educational institutions, where the outcome is often passive students.

Twenty years later, while the collaborative technology has changed, the calls remain the same. Social media are being proclaimed as being able to impact the learning environments of educational institutions by changing, and possibly improving, the pedagogical approach. The impact again comes in the form of changing from a traditional learning approach, to a collaborative learning approach. However, the problem that has been identified is:

> *There is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning.*

This provides an opportunity for research to be conducted to provide such an understanding, which will benefit practice, in particular educational institutions, and educators.

For practice, because learners are already tech savvy in the platforms of social media, educators are adopting their platforms to try and motivate learning and foster engagement (Tan et al., 2011; Zhang, 2012). However, it is important for educational institutions, and educators, to understand how to utilise social media in a manner that benefits their learners, otherwise there is the potential to fail to learn from the past, where technology was used to merely aid traditional learning environments as opposed to impact, and change them, which resulted in little improvements with the exception of speeding up the ineffective processes and methods of teaching (Leidner and Jarvenpaa, 1995). By understanding if the platforms of social media are effective at enabling collaborative learning environments, both educational institutions, and educators, will be able to make an informed decision on whether or not the adoption of social media is beneficial to their learners. Further to this, by being able to evaluate their own collaborative learning environments, educators would also be able to understand where they can improve aspects of them, to increase the benefit to learners.

However, from the literature review that has been conducted, it has been observed that little research has actually been conducted on the impact of social media on collaborative learning environments. Instead, research has focused on implementing social media in other types of learning environments. For example, Zhang (2012) introduce a social media platform, namely a blog, to a learning environment that is built on constructivism (see Table 3-1), but they do not create a collaborative learning environment. They refer to their learning environment as a *"Socially Enhanced Classroom Blog"*, which requires learners to write blog posts each week on an article that relates to the topic discussed in class that week. They indicate that such a learning environment *"shows significant, positive correlations between the use of socially enhanced blogs and student learning."* (Zhang, 2012, p.1).

Virtual worlds are by far the most popular type of platform that has been studied in relation to social media platforms impact on learning environments. Numerous studies have been conducted (Schultze et al., 2007; Franceschi et al., 2009; Phang and Kankanhalli, 2009; Chen et al., 2010; Kumar, 2012; Lattemann and Stieglitz, 2012), but none of these focus on collaborative learning environments either. For example, Kumar (2012) focuses on virtual worlds, and a learning environment that is also built on constructivism. They do not provide a name for their learning environment, but learners, as part of a course, had to sign up to a virtual world named Second Life, and were required to explore the world to try and understand the teaching and learning potential of the technology. They indicate that *"such a learning environment can be used to enhance the learning experiences of students by* *providing opportunities for experiential and immersive learning”* and *“Second Life is a great instructional technology that supports constructivist and social learning”* (Kumar, 2012, p.5). There was only one study who mentions collaborative learning, which was Franceschi et al. (2009), although there focus is more on group based e-learning, as opposed to collaborative learning environments enabled by virtual worlds.

However, the issue with each of these studies is that while they do provide important findings for instructors in relation to adopting social media into different types of learning environments, they are each specific to the study that has been set up. That is to say, no framework has been built in these studies to allow educators to evaluate the effectiveness of the learning environments that they build, but instead are reflective only of the ones in the studies.

This provides an opportunity for such a framework to be developed, which allows educators to evaluate the effectiveness of the collaborative learning environments they build. Thus, it is a new solution to a known problem, as understood from Gregor and Hevner (2013) contribution framework.. To help develop such a framework, and provide a focus for this research, the next activity in the DSR process model, objective of a solution, is presented next. This objective is inferred from the problem that has been stated above, and two research questions are created to help achieve this objective.

3.3 Objective of a Solution

Activity 2 in the IS design science process model sates that *“the objective(s) for the research is necessary to provide focus. The objective(s) should be inferred from the problem definition, while also stating what is possible and feasible”*. While a relevant problem that needs to be addressed has been identified in section 3.2.3, the objective that has been inferred from this is:

> *Evaluate the effectiveness of social media enabled collaborative learning environments*

To be able to evaluate the effectiveness of these SMECLEs, an evaluation framework is needed, which is currently lacking from the literature, which would help to understand if social media platforms are effective at enabling collaborative learning environments. Hustad and Olsen (2014) define IS teaching frameworks as a class of problems, where a contribution is made to this class in the form of an Enterprise Systems teaching framework. This study looks to develop an artefact in the form of an evaluation framework for SMECLEs that is also a contribution to this class. An evaluation framework consists of a number of building blocks (McNaughton et al., 2010), and the design for this evaluation framework requires identifying what these building blocks are, while the build involves putting the blocks together in a way that allows the framework to be used for its intended purpose. To help achieve this, the following research question will be answered:

> ***RQ1:*** *What are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?*

As Hevner et al. (2004) fifth guideline indicates, it is necessary to use the scientific knowledge base to ensure research rigor. The evaluation framework that this study focuses on constructing, referred to as the SMECLE evaluation framework, draws from the existing body of IS research on social media, as well as IS research on collaborative learning. From this, three building blocks were identified as being necessary to construct such an evaluation framework: the first building block is the social media platform (SMP) – this is necessary as there are different types of social media platforms available, and each one can be utilised when creating SMECLEs. It is necessary to be able to explicitly state what SMP is being used when evaluating a SMECLE, therefore the first building block that must be added to the SMECLE evaluation framework is:

Social Media Platform

Secondly, as the framework needs to be able to evaluate the effectiveness of SMECLEs, two more building blocks identified were social media characteristics (SMC) and collaborative learning characteristics (CLC). By understanding if the characteristics of social media enable any of the characteristics of collaborative learning, the effectiveness of SMECLEs can be understood. Therefore, two more building blocks for the evaluation framework are:

Social Media Characteristics

Collaborative Learning Characteristics

While these three building blocks have been identified as the components necessary to build a SMECLE evaluation framework, a literature review is necessary to develop a better understanding of each, which consists of defining each one, and creating an understanding of what they entail. These building blocks are used to build the SMECLE evaluation framework, followed by an evaluation of its usefulness. The objective will be used in this evaluation phase, where it will act as a metric at the end of each phase, to determine if the evaluation framework has achieved its intended goal of solving the identified problem. Once the SMECLE evaluation framework has been built through the design, build, and evaluate phase, and no further improvements can be made, it will be used to evaluate six different SMECLEs, where the following research question will be answered:

> ***RQ2:*** *What are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?*

This will further help achieve the objective that has been set, as it will highlight the trends that are evident in each of the SMECLEs that will be run, indicating what social media characteristics enabled what collaborative learning characteristics, thus providing an understanding of how effective these SMECLEs were. However, before these research questions are answered, a thorough search of previous research on the topics must be performed. A review of the social media literature, and then the collaborative learning literature, in the IS field is conducted and presented, but first the methodology for these literature reviews is explained.

3.4 Literature Review Methodology

The methodology for conducting a literature review, introduced in Chapter 1, was applied to conduct a review of social media, and collaborative learning in IS research. The aim of this literature review was to identify articles to help build an understanding of both social media, and collaborative learning, and to create definitions for both. Table 3-2 presents the steps for this literature review, where a total of 476 social media articles and 214 collaborative learning articles were identified from the initial search, referred to as Iteration 1, in which the search ranged from the years 2000-2015 and 1984-2015 respectively. This involved identifying articles that contained any of the key words that were highlighted as being relevant (and when new words were highlighted, the search was started over). From here, a detailed review was undertaken of the abstracts and keywords of each one identified, referred to as Iteration 2. This review was used to identify articles that would help provide an understanding of social media, and collaborative learning, as well as identify the characteristics inherent of each one. This resulted in 210 of these articles being used to create the social media concept centric matrix, and 48 were used to create the collaborative learning concept centric matrix. Both these concept centric matrices were then synthesised to provide an overview of both areas. An overview of social media in the IS literature is presented in the next section.

Phase	Step	Outcome
1. Selecting the Sources	Specify the domain of interest.	Social Media and Collaborative Learning
	Identify relevant sources for selected domain.	Conferences: AMCIS; ECIS; ICIS Journals: Senior Scholars' Basket of Journals
2. Search Strategy	Identify key search terms.	Social Media; Web 2.0; Collaborative Learning; Cooperative Learning
	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their "title", "abstract" or "keywords" section.	Conferences: 168 AMCIS Articles; 134 ICIS Articles; 188 ECIS Articles Journals: 13 EJIS Articles; 18 ISJ Articles; 23 ISR Articles; 23 JIT Articles; 52 JMIS Articles; 23 JAIS Articles; 31 MIS Quarterly Articles: 3 JSIS Articles
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	Conferences: 105 AMCIS Articles; 96 ICIS Articles; 125 ECIS Articles Journals: 7 EJIS Articles; 13 ISJ Articles; 18 ISR Articles; 10 JIT Articles; 29 JMIS Articles; 17 JAIS Articles; 25 MIS Quarterly Articles: 1 JSIS Articles
3. Coding Schemes	Determine what is going to be captured from the pool of articles.	Overview of social media Overview of collaborative learning
4. Article Review	Read the articles, and capture the required data.	Concept centric matrix for social media, and collaborative learning
5. Analysis and Write Up	Analyse the gathered data, and report findings.	Literature review of social media, and collaborative learning

Table 3-2 Literature Review of Social Media, and Collaborative Learning

In the following section this methodology is applied to the research that has been conducted on social media in IS research, which helps to provide an overview of the topic. This consists of providing an understanding of what social media is, how it differs from the term Web 2.0, and the adoption of a definition of it for this research.

3.5 Overview of Social Media in IS Research

From 2003, the World Wide Web started to change, where websites started to implement more interactive platforms, which allowed users to participate on them (Seo and Rietsema, 2010). This change has improved the popularity of different types of computer-mediated communication technologies such as email, discussion forums, and instant messengers (Cheung and Lee, 2007), and a new type of platform emerged, namely social media (Cheung and Lee, 2007; Riemer et al., 2011; Kane et al., 2014). These internet-based platforms support communication and collaboration amongst their users, and their rapid growth has seen them penetrating people's lives (Yu et al., 2010; Riemer et al., 2011; Aoun and Vatanasakdakul, 2012; Kane et al., 2014), and has changed the ways in which people interact online (Riemer et al., 2011).

Due to its far-reaching consequences, research on social media is not confined to the IS discipline, but has been conducted across several other disciplines, including psychology and behavioural sciences, marketing, education, public relations, computer science, sociology, and strategy (Aoun and Vatanasakdakul, 2012; Aral et al., 2013). This interest from academic researchers is in relation to the success of many social media platforms, initially with services such as Bebo, and MySpace, and now Facebook, LinkedIn, and Twitter (Light et al., 2008; Rui et al., 2010; Braun and Esswein, 2012), and despite sceptics who questioned the legitimacy and the core value of social media, it still continues to impact society on many facets (Choi and Im, 2012). This has led to it becoming a "hot" topic to research in the IS discipline (Light et al., 2008; Choi and Im, 2012).

From the concept centric matrix that was created, it was apparent that the IS field started to become interested in the phenomena of social media in 2007, where five articles were published, four of which appeared in conferences (1 AMCIS, 2 ICIS, and 1 ECIS), and one in the AIS senior scholars' basket of (eight) journals (JMIS). These consisted of conceptual, empirical, and panel articles, with the focus of research on topics such as introducing an informatics view for doing research, to building a theoretical framework to try understand why users continue sharing knowledge in virtual communities. As shown in Figure 3-1, the trend of research on the topic of social media in the IS discipline has, for the most part, continued to grow since these initial articles.

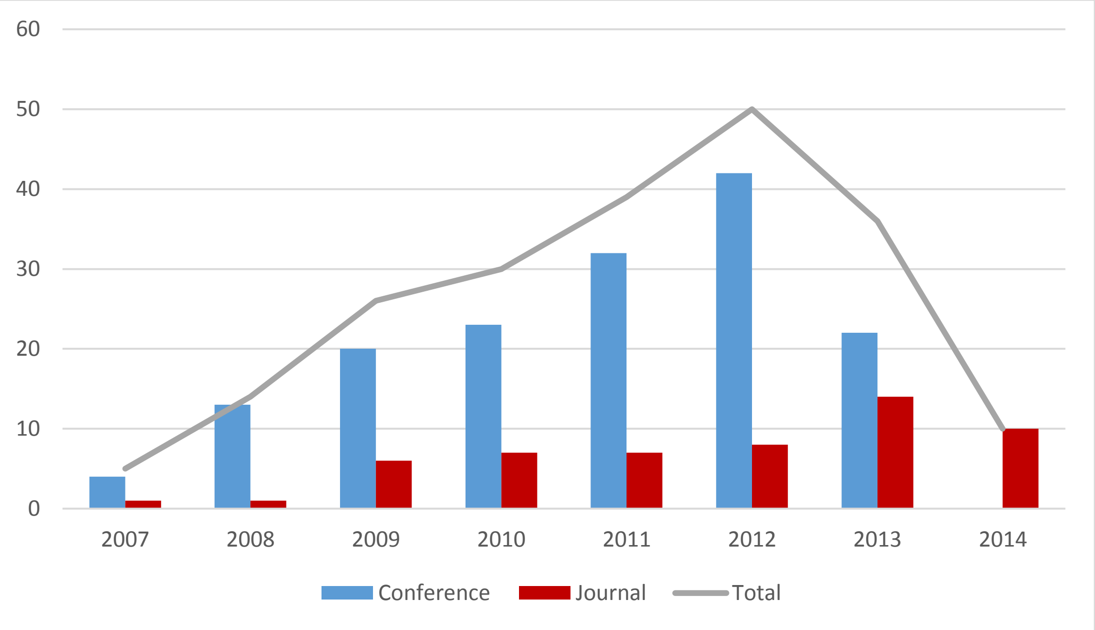

Figure 3-1: Trend of Social Media Related Articles in IS Research

Similar to the practitioner literature, IS literature began to note the potential importance of social media also, mainly due to the increasing interest that individuals were showing in it (Ali-Hassan and Nevo, 2009; Chau, 2010), where social media is seen as a grassroots IS, meaning it was individuals who adopted it first, pushing organisations to adopt it, which is a bottom-up way to disseminate IS (Seo and Rietsema, 2010). This adoption has led to social media being viewed as one of *"the most transformative impacts of information technology on business, both within and outside firm boundaries. Social media have revolutionized the ways organizations relate to the marketplace and society, creating a new world of possibilities and challenges for all aspects of the enterprise"* (Aral et al., 2013, p.3). This is in contrast to how it was initially perceived, as organisations had seen them as time wasting interruptions for their employees (Husin and Hanisch, 2011), but users of social media expect organisations to be using it (Seo and Rietsema, 2010; Larson and Watson, 2011), similar to previous technologies, such as websites, and later e-commerce websites (Larson and Watson, 2011).

This view has driven organisations to increase their spending on social media (Larson and Watson, 2011), where they are using it to recruit employees, interact with consumers, and build communities of interest (Tan et al., 2011). However, due to the lack of academic research on it, organisations are investing money on a topic that little is known about, and the consequences of their use of it, even less so (Larson and Watson, 2011). Therefore calls were made in the IS literature in 2010 and 2011 for further research to be conducted (Choi et al., 2010; Goswami et al., 2010; Larson and Watson, 2011). While these calls may not have directly influenced research that has been published since, the amount of articles being published in conferences has increased each year up until 2012. There has also been an increase in the amount of articles being published in the AIS senior scholars' basket of (eight) journals up until 2013, where the first article on the topic of social media was published in 2007 in JMIS. Since then, there have been numerous special issues on the topic across these journals, including ISJ, ISR, JIT, JMIS, JAIS, and MISQ.

Research across these articles has focused on different aspects of social media, such as individual, group, and organisational use, with both conceptual and empirical ones dominating the type of research done. Topics have varied, including:

- individuals continued use of social media
- individuals intentions to learn through social media
- collaboration amongst groups on social media
- social media impact on group decision making
- how social media can bring value to organisations
- social media policies for organisations

The IS literature on social media has also highlighted some similarities as what the practitioner literature had highlighted such as its growing popularity, organisational interest in it, and the need for further research to be conducted to help inform practice on its possibilities, and drawbacks. Also, while there was scepticism among some researchers that the term would merely be a fad (Stenmark, 2008), the continued increase in publications would suggest otherwise. The research has looked to inform practice on the issues they have faced by focusing on a diverse range of topics. For this study, the topic of social media is too broad, so it needs to be focused further, but before this is done, a definition of social media is first presented in the next section.

3.5.1 Definition of Social Media

A common misunderstanding amongst researchers in the social media domain, is to use the term *"Social Media"* interchangeably with the term *"Web 2.0"* (Kaplan and Haenlein, 2010). This is such an issue, that the term *"Web 2.0"* had to be added to the list of search terms for conducting the literature review, as many researchers title their articles with it, or use it to describe social media in their research. It is important to understand that social media is not a synonym for Web 2.0 (Blinn et al., 2009), but is in fact built on the foundations that Web 2.0 represents (Kaplan and Haenlein, 2010; Chaitanya and Ganesh, 2011). Web 2.0 is used to distinguish the transition of the world wide web from a collection of websites, now named *"Web 1.0"*, to a fully-fledged computing platform (Pfaff and Hasan, 2007), the differences of which can be seen in Table 3-3. This platform is itself made up of a number of blocks, including mashups, semantics, and social media platforms (Chaitanya and Ganesh, 2011; Dwivedi et al., 2011).

	Web 1.0	Web 2.0
Status	Static	Dynamic
Users	Passive	Active
Communications	One-way	Two-way
Openness to modify content	Closed	Collaborative
Content providers	Companies	Communities
Structure to create content	Top down	Bottom up

Table 3-3: Characteristic Comparison of Web 1.0 versus Web 2.0 (source: Seo and Rietsema, 2010)

The term *"Web 2.0"* was coined by Tim O Reilly (2005), and defined it as:

> *"Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of*

that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation," and going beyond the page metaphor of Web 1.0 to deliver rich user experiences"

This definition indicates that Web 2.0 is more than an application or piece of technology (Stenmark, 2008). It is an extremely broad definition that incorporates people, processes, and technology, indicating that Web 2.0 incorporates these components to deliver a richer user experience while on the internet (Dwivedi et al., 2011). Kaplan and Haenlein (2010) indicate that social media are internet-based platforms that are built on the foundations of Web 2.0, and define it as:

"Social Media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content"

Therefore the term social media cannot be used interchangeably with the term Web 2.0, but is an example of the platforms it can provide. Further to this, defining what social media is for this research is necessary, and to do this, each definition that was available in the articles was reviewed, recorded, and analysed. These definitions are presented in Table 3-4. Each of these is different to each other in terms of the different terminology used to define social media as platforms, or applications, and what they encompass, from individuals interacting and collaborating, to how organisations can connect and share information.

Definition	Researcher
Online social media websites are defined as web-based platforms that allow individuals to interact and share information, opinions, insights, experiences, and perspectives with others.	Banks et al. (2010)
As such, we define social media to be the set of connectivity-enabled applications that facilitate interaction and the co-creation, exchange, and publication of information among firms and their networked communities of customers.	Larson and Watson (2011)
Social media is an umbrella term for a variety of applications, tools and services on the internet that allow individuals to interact with one another.	Richter and Schäfermeyer (2011)
Social media is defined as web sites with structural and interactive features that "seem to foster ongoing discussions between their authors and their readers making them more dialogic in nature than traditional Web sites".	Albert and Bettez (2012)
Social media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content	Kaplan and Haenlein (2010)

Table 3-4: Social Media Definitions from the IS Literature

The definition offered by Kaplan and Haenlein (2010) is the most used in the articles that were reviewed, so is adopted for this study:

> *"Social media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content."*

With this overview of social media in IS research completed, the next section introduces an overview of the next topic, collaborative learning, in IS research. This consists of providing an understanding of what collaborative learning is, how it differs from cooperative learning, and the adoption of a definition of it for this research. Further, an explanation of what a collaborative learning environment is, is also presented.

3.6 Overview of Collaborative Learning in IS Research

"At the heart of any learning activity is a learning model that is either implicitly or explicitly employed" (Ahmad et al., 1998, p.353). There are a number of models available, provided in Table 3-1, with the two major competing models being the objectivist approach, and the constructivist approach (Leidner and Jarvenpaa, 1995; Moallem, 2001; Neville et al., 2005). The former mainly consists of the current

approach to learning, that is teacher-centered, and is the most widely used (Neville et al., 2005; Kane and Fichman, 2009), but most educational researchers favour the constructivist approach (Stahl, 2006). These two models differ in their philosophical assumptions, goals, and implications for instruction, while the constructivist approach has a number of models that are derived from it, namely the collaborative model of learning, and the cognitive information processing model of learning (Leidner and Jarvenpaa, 1995; Moallem, 2001). There is also the socioculturalism model, which *"shares some assumptions and goals with constructivism, but challenges some others"* (Leidner and Jarvenpaa, 1995, p.266).

Collaborative learning can be seen as a personal philosophy, rather than just a classroom technique, where individuals must share authority, and accept responsibility for the group's actions (Kirschner, 2001). The major goal of collaborative learning is to construct shared understanding through the interaction of individuals (Leidner and Jarvenpaa, 1995). However, an implicit goal is to also improve communication, listening skills, and elicitate participation of the individuals involved (Alavi, 1994; Leidner and Jarvenpaa, 1995). Therefore, collaborative learning can be used to implement a learner-centered approach, where knowledge is constructed by the learners through discovering the world themselves (Wiener, 1986; Leidner and Jarvenpaa, 1995; Bronfman, 2000; Kirschner, 2001; Moallem, 2001; Kane and Fichman, 2009). This discovery is guided through individual thinking, interactions with members of the groups they are assigned to, interactions with members of the larger community that is the class, and by interactions with peers from the discipline's community (Bruffee, 1999). The outcome of which is students who are able to think critically (Andersson et al., 2009).

Similar to how the terms social media, and Web 2.0, are used interchangeably, cooperative learning, and collaborative learning also suffer from this. A distinction of the two terms is presented in the next section, which is followed by a definition of collaborative learning.

3.6.1 Definition of Collaborative Learning

Before a definition of collaborative learning is presented, a distinction is required between cooperative and collaborative learning. While both are founded in the constructivist model of learning (Panitz, 1999; Moallem, 2001; Wang, 2009), and have similar goals, a common misunderstanding exists amongst researchers in using the terms interchangeably (Dillenbourg et al., 1996; Moallem, 2001). While both approaches encourage learning to occur through individuals interacting with each other, in a group setting, with constructive conversation, to create a shared understanding of a problem (Bruffee, 1999; Moallem, 2001), it is the differences between them that distinguish the terms from being used interchangeably, and these are presented in Table 3-5.

Approach	Cooperative Learning	Collaborative Learning
Learning	Instructor-centred	Student-centred
Problems to be Solved	Closed	Open-ended
Group Member Roles	Assigned roles	Shifting roles
Task Completion	Task is divided between group members	Group members complete task together

Table 3-5: Differences in Cooperative and Collaborative Learning

In collaborative learning, the learning is student-centred, where students self-govern themselves which is in contrast to cooperative learning, where the approach remains instructor-centred (Bruffee, 1999; Kirschner, 2001). Collaborative learning then involves solving an open-ended question, where there is no ‘correct’ answer (Leidner and Jarvenpaa, 1993; Bruffee, 1999; Panitz, 1999; Alavi et al., 2002; Kwok et al., 2002; Kotlarsky and Oshri, 2005; Brown et al., 2010). Cooperative learning requires the group to complete a closed problem, where the answer is predictable, (Panitz, 1999). Group member roles in collaborative learning shift between different members, depending on the nature of the problem and the topic being discussed (Dillenbourg et al., 1996; Bruffee, 1999). But cooperative learning groups assign specific roles to each of the members, such as recorder and summarizer, at the start. (Smith and McGregor, 1992; Bruffee, 1999). In a collaborative learning environment, individuals then participate in a coordinated effort to complete the assigned task (Dillenbourg et al., 1996; Alavi et al., 2002; Neville et al., 2005). However, once roles are assigned, cooperative groups divide the work to be done into sections, where each individual is responsible for their section, with coordination required when bringing all the sections together at the end (Dillenbourg et al., 1996).

To illustrate these differences, consider the following example: in the discipline of History, a cooperative learning environment might be created, consisting of groups between 3-4 members, where the instructor sets a closed problem for learners that asks the question *"Who won World War 2?"*. The problem has a definitive answer that the group members will work towards with the aid of the instructor when required. Each group member will have an assigned role within the group, and a section of the problem to solve (this might involve reading various texts on the war, and writing up about it). The answer that is most likely to come from each group is *"the allies won World War 2"*. The instructor then informs the groups if they were right or wrong.

In a collaborative learning environment, consisting of groups between 3-4 members, the instructor sets an open-ended problem, where there is no definitive answer - so the question this time would be *"how did the allies win World War 2?"* The learners are then tasked with finding the information themselves, and reaching a consensus together on what their answer should be. Roles between members will change as sometimes someone will direct the group towards an idea, and other times another member may take control to guide the group to another idea. Eventually the groups present their answers, where different perspectives may be given. One group might argue that the airstrikes in Dunkirk were the dominant reason; while another group might argue it was because Pearl Harbour got attacked. The benefit of this is the class are getting multiple perspectives, rather than just the instructor's view. The instructor then acts as a peer to the discipline's community, and concludes if the answers provided are worthy of the History community. These differences are critical in understanding the difference between cooperative and collaborative learning, and can actually be used to complement each other, where cooperative learning is used with younger learners, while collaborative learning is used with older learners.

With this distinction now clear, a definition of collaborative learning can be presented. Collaboration is defined as *"making a joint effort toward a group goal, where joint effort encompasses acts of shared creation and/or discovery"* (Boughzala et al., 2012, p.715), while Shuell (1986) defines learning as "changes in an individual's mental models or knowledge representations". These changes emerge as learners interact with a stimulus (information) (Alavi et al., 2002). The IS literature offers a number of definitions, which are presented in Table 3-6. All of them are quite similar, where they involve individuals working together in groups towards solving a task.

Definition	Researcher
Collaborative learning is a personal philosophy, not just a classroom technique. …There is a sharing of authority and acceptance of responsibility among group members for the group's actions. The underlying premise of collaborative learning is based upon consensus building through co-operation by group members, in contrast to competition in which individuals best other group members.	Kirschner (2001)
The term 'collaborative learning' refers to an instruction method in which students work in groups toward a common academic goal	Gokhale (1995)
The broadest (but unsatisfactory) definition of 'collaborative learning' is that it is a situation in which two or more people learn or attempt to learn something together.	Dillenbourg (1999)
Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together	Smith and McGregor (1992)
Collaborative learning is a learning situation in which more than one student participates in a common learning activity engaging them in pursuit of a common goal.	Romero et al. (2012)

Table 3-6: Collaborative Learning Definitions from the IS Literature

The definition offered by Gokhale (1995) is adopted for this study, but is altered to incorporate all the elements of collaborative learning:

> *"Collaborative learning is a learning model in which learners work in groups toward completing a common task."*

With an understanding of collaborative learning, the next section introduces collaborative learning environments, how to construct them, and how social media can enable them.

3.6.2 Collaborative Learning Environments (CLEs)

Collaborative learning environments are defined as *"another approach to learning in a setting, where there are shared realistic and relevant problems, where there are shared needs and goals, where there is room for multiple perspectives on the problems and their solutions, where there are shared responsibilities both for the process of achieving a final product and for the product itself, and where there is mutual trust in one another such that participants are valued for their contributions and their initiative. In other words, in a collaborative and/or cooperative learning setting."* (Kirschner, 2001, p.4). These environments can be created at any time, but when designing them, a number of design principles (DPs) need to be followed in order to allow the potential of collaborative learning to be able to occur. These DPs were developed from the understanding of what constitutes collaborative learning, and are presented in Table 3-7.

DP	Explanation
DP1	The instructor must give a foundational introduction to the topic that they wish the learners to discuss for the task.
DP2	The instructor must create groups, where the size must be 3-4 members.
DP3	A task must be assigned for groups to actively seek an answer to, which must not have a definitive answer, in a set time period.
DP4	Relationships must be able to form amongst the learners, and the instructor, allowing information to flow between them.
DP5	When the task is completed, groups must present their solution to the class.
DP6	The instructor must act as the liaison between the learners and the community that they wish to join by saying whether the solutions are acceptable to the community.

Table 3-7: Design Principles of Collaborative Learning Environments

When these design principles are applied, a CLE can be designed and built. Consider the following example: an Information Systems instructor wants to introduce the topic of *"The Role of a Systems Analyst"* and wishes to build a CLE for students to explore the topic themselves. The setting for this is a typical classroom. The instructor proceeds over a set period of time to give the students the foundational information required for the topic. When the instructor feels the students have the foundations required to understand the topic, they can start to create their groups. This will involve breaking the class into the groups of 3-4 members first, and then getting them to sit together as their groups so they can work together, allowing relationships to be formed. The instructor must then provide them with the task, i.e. what is the most critical skill a systems analyst requires in today's business environment?

This task does not have a definitive answer, and can in fact be answered in many different ways – it will depend on the group's members, their diversity, and their understanding of the task that will determine how they answer it. For example, one group may decide to focus on one particular sector and come to a consensus on why a particular skill is more in demand over another, while another group may focus just on which one is most important and why. The instructor decides how long they want the students to interact for, and this can occur over a class, or a number of classes. Eventually, when the groups have a solution to the task, they present it in front of the class. This provides each learner with different perspectives on what the most critical skill for an analyst is. The instructor must then act as a liaison between the class and the IS community, and say whether the solutions are with the community thinking or not.

It is evident from this example how the design principles of a CLE are applied in a classroom setting, but these DPs can also be utilised by instructors to create CLEs that are enabled by technology, where the technology that is adopted must be able to enact the principles. In this study, the collaborative learning environments that are designed and built are done so with social media platforms, and the DPs of a CLE are enacted, which are referred to as Social Media Enabled Collaborative Learning Environments (SMECLEs). A summary of this chapter is presented next.

3.7 Summary

The objective of this chapter was to identify a relevant problem in practice. To identify such a problem, an interesting research topic was identified, and this was done by observing what trends were occurring in practitioner literature. From this, social media was identified as an interesting topic, however it required some focus as it is too broad as a topic on its own. It was evident that social media are a collaborative technology that are proclaimed to be capable of impacting the learning environments of the future, especially those of educational institutions, a trend that is very similar to twenty years ago, with other collaborative technologies such as GDSS. It is understood that this impact comes in the form of changing from a traditional learning approach, to a collaborative learning approach. *However, the problem that has been identified is that there is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning environments.* This provides an opportunity for research to be conducted to provide such an understanding, which will benefit practice, in particular educators. To be able to solve such a problem, it is necessary for educators to be able to evaluate the effectiveness of the collaborative learning environments that are enabled by social media, but from the literature review, it was evident that such an evaluation framework is currently lacking, thus providing an opportunity for one to be built.

To be able to provide a solution to the problem that was identified, an objective was set, which was inferred from the problem stated, and is as follows: *Evaluate the effectiveness of social media enabled collaborative learning environments*. Thus, to be able to achieve this objective, two research questions were set. **RQ1:** *What are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?* Three building blocks for building such an evaluation framework were highlighted as being necessary, namely social media platforms; social media characteristics; and collaborative learning characteristics. **RQ2:** *What are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?* This will provide knowledge to help develop the understanding that is currently lacking both in practice, and the knowledge base.

Lastly, once the problem was identified, and the objective was set, a thorough search of previous research on the topics of social media, and collaborative learning, was performed (Hevner et al., 2004; Hevner, 2007). To achieve this, a literature review of the IS research on social media was conducted, where relevant articles from the AIS senior scholars' basket of (eight) journals, and the conferences of AMCIS, ICIS, and ECIS, were consumed. From this an understanding of social media in IS research was presented, with an explanation on how it differs from the term Web 2.0, and the adoption of a definition for this research. Similarly, a literature review of the IS research on collaborative learning was also conducted, where relevant articles from the AIS senior scholars' basket of (eight) journals, and the conferences of AMCIS, ICIS, and ECIS, were consumed, where an understanding of collaborative learning was provided, with an explanation on how it differs from the cooperative learning, and the adoption of a definition for this research. Further to this, the design principles on how to design and build CLEs were also identified and explained. Each of the research questions will be answered in the following chapters, beginning with RQ1, which involves designing, building, and evaluating an artefact, and this is done in the next chapter.

Chapter 4 Designing, Building, and Evaluating a SMECLE Evaluation Framework

4.1 Introduction

This chapter presents the design cycles, which consist of activity 3 and 4 for conducting DSR, with the intention to design, build, and evaluate the SMECLE evaluation framework. Designing and building an artefact involves moving from the research objective and actually demonstrating that it is feasible to build such an artefact. The design involves understanding the studied domain, and applying relevant scientific and technical knowledge, while the build refers to the construction of the artefact (constructs, models, methods, and/or instantiations) based on this knowledge, demonstrating such an artefact can be constructed. Once an artefact has been built, the researcher must evaluate its utility by comparing the objectives of the solution from *"Activity 2: Objective(s) of a Solution"*, to actual observed results from the use of the artefact in its intended environment. These objectives therefore act as the metrics, which define whether the artefact has achieved its intended goal of solving its identified problem, or not. This evaluation can be done in many ways, such as experiments, observations, or field studies, and is dependent on the problem environment and the artefact itself. It is also an iterative step, where the researchers can decide to take the lessons learned in the *evaluation* activity and return to the *design and develop* activity to improve the artefact. Alternatively, they can move onto the next activity and leave further improvements for future research. Crucially, if the metrics used to measure the artefact are weak, or there is a failure to measure the artefact's performance with these metrics, there is great difficulty in judging research contributions.

From a review of the DSR literature conducted previously, it is evident that not many studies focus on developing frameworks through DSR, but instead prefer to focus on creating frameworks to guide DSR such as Kuechler and Vaishnavi (2012), Carlsson (2006), and Patas et al. (2011). Only a few studies were identified as developing an evaluation framework through DSR, such as: a framework for IT service management (McNaughton et al., 2010); a teaching framework for Enterprise Systems classes (Hustad and Olsen, 2014); and a meta-learning framework for detecting financial fraud (Abbasi et al., 2012). Therefore the research question that will be addressed in this chapter is w*hat are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?* The remainder of this chapter is structured as follows. The first design cycle, referred to as Phase 1, is introduced which involves designing and building a SMECLE evaluation framework through a literature review of both social media, and collaborative learning, to identify and explain the building blocks needed for such an evaluation framework. This is followed by an evaluation of the framework, where the learnings of the incompatibilities are noted, and used to redesign and rebuild the evaluation framework in Phase 2. In total there are six of these design cycles, where each time the evaluation framework is designed and built based on the learnings of the previous phase, and evaluated with the data sets introduced in Chapter 1. The final section will conclude with a brief summary of the chapter. Introduced first is a note on the evaluation for this study, explaining how it was done.

4.1.1 A Note on Evaluation for this Study

After each design and build cycle, the framework was evaluated for its usefulness at evaluating the effectiveness of social media enabled collaborative learning environments (SMECLEs). Any time that it was shown not to be useful at achieving this objective, the framework was put through another design cycle to improve it, resulting in iterative steps. Six design studies, introduced in the reference guides section in the introduction, were used in these design cycles. Table 4-1 illustrates each version of the evaluation framework, and the case study that was used to evaluate it. For example, for SMECLE evaluation framework V1.0, there was only a single dataset used to evaluate it, as a number of rules were determined to be incompatible with the IS6119 dataset, and thus not useful at evaluating SMECLEs.

For V2, after another design and build phase, where the rules were amended, another dataset was used to evaluate it (it was not necessary to evaluate IS6119 again as the rules would satisfy that now, represented by the red Y). However, the new dataset, IS3101 identified a number of rules to be ineffective. This process continued until no more rules needed to be amended, or cell structures needed to be changed.

Social Media Platform	Dataset	V1	V2	V3	V4	V5	V6
Microblog	IS6119	X	Y	X	X	X	Y
	IS3101		X	Y	X	X	X
	IS4428			X	X	X	X
Blog	IS2200			X	Y	X	X
	IS6118				X	Y	X
	IS1100					X	X

Table 4-1: The Design Cycles for the Research, with the datasets used to evaluate each version of the SMECLE Evaluation Framework

How the evaluation was done, and by whom (Two-Step Evaluation)

The evaluation consisted of two steps. The first step involved the researcher evaluating the framework for its usefulness. This was done by analysing a data set(s) with the framework (as shown in Table 4-1), identifying where cell rules, and/or cell structures, were demonstrated to be effective, and ineffective. For example, the researcher observed in the IS3101 data set, with version 2 of the evaluation framework, that when learners shared content (*Content Sharing*), and showed their understanding of it (*Active Learning*), it was sometimes acknowledged by learners, and other times it was not. This was deemed to demonstrate that the cell was ineffective, as it was capturing all instances of *Content Sharing* enabling *Active Learning* at one level.

The second step involved a two hour evaluation session with two senior educators. This was done by discussing the effective, and ineffective, cell rules, and/or cell structures, that were identified in the first step, and why they were determined to be so. From this, recommendations on what changes should be made to the framework were suggested, and used in the next design, and build phase. For example, when the ineffective cell from step one above was discussed with the senior educators, it was determined that the cell structure was ineffective, and should be divided to allow *"Individual"* and *"Group"* instances to be captured. This resulted in a more effective cell structure, as it allows educators to capture when content shared was either only beneficial to an individual, or to a group. Phase 1 of the design cycle is introduced in the next section.

4.2 Phase 1: Designing the SMECLE Evaluation Framework V1.0

4.2.1 Social Media Platforms: A Literature Review

Social media constitutes a number of different platforms, with Kaplan and Haenlein (2010) identifying five types: social networking sites (SNS); virtual worlds (consisting of virtual social worlds and virtual game worlds); collaborative projects; blogs; and content communities, while a sixth, microblogs, was also identified from the literature review. Further to this, the literature review was used to provide an understanding of each platform from an IS perspective. The next section provides an overview of the methodology applied to conduct this literature review.

4.2.1.1 A Literature Review Methodology

The methodology for conducting a literature review, introduced in Chapter 1, was applied to conduct a review of the platforms that social media enables. The aim of this literature review was to identify articles to help build an understanding of the five social media platforms identified by Kaplan and Haenlein (2010). Table 4-2 presents the steps for this literature review, where a total of 476 social media articles were identified from the years 2000-2014 from the initial search, referred to as Iteration 1. This involved identifying articles that contained any of the key words that were highlighted as being relevant (and when new words were highlighted, the search was started over). From here, a detailed review was undertaken of the abstracts and keywords of each one identified, referred to as Iteration 2. This review was used to identify articles that would help provide an understanding of social media platforms. This resulted in 210 of these articles being used to create the social media concept centric matrix. This concept matrix was then synthesised to provide an explanation of the social media platforms.

Phase	Step	Outcome
1. Selecting the Sources	Specify the domain of interest.	Social Media
	Identify relevant sources for selected domain.	Conferences: AMCIS; ECIS; ICIS Journals: Senior Scholars' Basket of Journals
2. Search Strategy	Identify key search terms.	Social Media; Social Technologies; Social Computing; Web 2.0; Wiki; Microblogging; Blogging; Social Networks; Social Communities; Content Communities; Virtual Worlds
	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their *"title"*, *"abstract"* or *"keywords"* section.	Conferences: 124 AMCIS Articles; 116 ICIS Articles; 137 ECIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 16 ISR Articles; 13 JIT Articles; 19 JMIS Articles; 14 JAIS Articles; 20 MIS Quarterly Articles: 2 JSIS Articles
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	Conferences: 95 AMCIS Articles; 87 ECIS Articles; 111 ICIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 13 ISR Articles; 6 JIT Articles; 13 JMIS Articles; 10 JAIS Articles; 18 MIS Quarterly Articles: 0 JSIS Articles
3. Coding Schemes	Determine what is going to be captured from the pool of articles.	Platform(s) studied in the articles.
4. Article Review	Read the articles, and capture the required data.	Concept centric matrix for social media platforms
5. Analysis and Write Up	Analyse the gathered data, and report findings.	Explanation of each social media platform

Table 4-2: Literature Review of Social Media Platforms

From the literature review, it was evident that social networking sites were the most researched platform, where a total of 73 articles focused on them. The next closest platform was virtual worlds, where 38 articles focused on them. The others were fairly close, where collaborative projects had 23 articles, microblogs had 18 articles, and blogs had 13 articles. The least researched platform was content communities, where only 5 articles focused on them. Surprisingly, there were 59 articles that either did not mention the platform they were focusing on (instead using the term social media), or were focusing on a platform they consider to be a social media one, such as rating websites. An understanding of each of these six platforms is presented in the following sections, where the concept matrix that was created from the literature review above is drawn on. As social networking sites are the most researched, they are the first concept to be introduced.

4.2.1.2 Concept 1: Social Networking Sites

Social networking sites (SNS) are platforms that allow users to create a personal profile of themselves, containing information such as their age, location and interests (Boyd and Ellison, 2007; Kaplan and Haenlein, 2010). Users can share text-based content, along with other content such as pictures, videos, and other forms of media (Kaplan and Haenlein, 2010; Mamonov, 2013). In order to communicate with other users, a bi-directional agreement must often be made, allowing access to each other's profiles (Boyd and Ellison, 2007; Kaplan and Haenlein, 2010). When a connection is made, a network of users is created, where anyone connected to the network can view everyone else's profile, and therefore interact with them (Boyd and Ellison, 2007; Kaplan and Haenlein, 2010; Kane et al., 2014).

The interactions can be private, with private messages being sent between individuals, or public where everyone can see comments that are made (Boyd and Ellison, 2007) and content that is shared. This can provide a personal focus for content being sent, or a group focus. Individuals within the network can then respond to these comments, or private messages can be sent back (Boyd and Ellison, 2007). As SNS evolve though, further mechanisms to communicate are created such as buttons to *"like"* messages, and group *"friends"* into categories such as *"co-workers"*, *"college friends"* and *"hometown friends"*. Also, SNS have started to introduce tools such as simple text editors, which allow users to create documents with other users, and surveys.

Popular SNS include Facebook, MySpace, and LinkedIn, which have attracted hundreds of millions of users, who use the sites on a daily basis (Boyd and Ellison, 2007).

4.2.1.3 Concept 2: Virtual Worlds

Virtual worlds (VWs) are computer based, 3-D, immersive, shared, interactive, and persistent, environments (Schultze et al., 2007; Chesney et al., 2009; Kong and Kwok, 2009; O'Riordan et al., 2009; Vitzthum et al., 2009; Cahalane et al., 2010; Chen et al., 2010; Stieglitz and Lattemann, 2011). Users are represented by avatars (Ahonen et al., 2008; Chesney et al., 2009; Walia, 2009; Cahalane et al., 2010; Nah et al., 2011; Stieglitz and Lattemann, 2011) and are able to navigate, communicate, collaborate, and trade with other users (Ahonen et al., 2008; O'Riordan et al., 2009; Walia, 2009; Stieglitz and Lattemann, 2011). VWs can take many forms, but the dominant two types are massive multiplayer online games (MMOGs), and Social Virtual Worlds (SVWs) (Schultze et al., 2007; Ahonen et al., 2008; Guo and Barnes, 2009; Cahalane et al., 2010; Mäntymäki and Merikivi, 2010). MMOGs consist of an online game played simultaneously by hundreds or thousands of players (Assmann et al., 2010; Putzke et al., 2010), which offer story-lined scenarios, where users interact with both the designed environment and computer-controlled characters, as well as with the other players (Guo and Barnes, 2009; Kong and Kwok, 2009). Users play with and against each other, with the experience being psychologically meaningful to all participants (Assmann et al., 2010). Social virtual worlds (SVWs) contain no narrative goals or tasks to be accomplished (Mäntymäki and Merikivi, 2010), but instead look to replicate elements of the real world (Davis et al., 2009; Franceschi et al., 2009; Walia, 2009). For example they often have their own currencies, avatar and object customisation, and property ownership (Barnes, 2009). Users can take part in a number of activities that include *"going to social events such as clubs, discussions, or political meetings, participating in seminars, collaborating, doing business, making objects, buying and selling, and building"* (Walia, 2009, p.1).

Popular MMOGs include World of Warcraft, EverQuest, and RuneScape, while popular SVWs include Second Life, Habbo Hotel, and Sony PlayStation Home.

4.2.1.4 Concept 3: Collaborative Projects

Collaborative projects allow users to create content simultaneously (Kaplan and Haenlein, 2010), with the underlying concept being that the input of many users can lead to a better outcome than an individual can achieve on their own, with more credible and stable content being created (Godwin-Jones, 2003; Tredinnick, 2006; Kaplan and Haenlein, 2010). Often we are talking about wikis or social bookmarking, where the former consists of a simple dynamic web page which anyone can access, modify, and discuss in a collaborative fashion (Dutta et al., 2008; Majchrzak et al., 2008; Kane and Fichman, 2009; Meng and Gong, 2009; Xu and Zhang, 2009). The latter consists of the *"group-based collection and rating of Internet links or media content"* such as social bookmarking services (Kaplan and Haenlein, 2010, p.62). Social news tools are an extension to these collaborative projects. These are a collection of user submitted links, where other users vote the most popular ones up and the unpopular ones down. This gives the users the power of choosing what links should be immediately visible. Users are increasingly using Collaborative Projects as their main source of information (Popitsch et al., 2008; Kaplan and Haenlein, 2010).

Popular collaborative project services include Wikipedia, Delicious Bookmarking, and Reddit.

4.2.1.5 Concept 4: Microblogs

Microblogs are a platform that have been derived from blogs (Java et al., 2007; Holotescu and Grosseck, 2008; Riemer et al., 2010). Users create a profile (Honeycutt and Herring, 2009), and are then able to publish information online about their activities, opinions, and/or status, with a character limit on the message being between 140-200 characters (Java et al., 2007; Holotescu and Grosseck, 2008; Riemer et al., 2010). This provides clear differences with blogs, such as a faster mode of communication, and frequency with which users can provide updates as such short messages require less thought and time (Java et al., 2007; Cheng et al., 2011). Participants on microblogs can be classified as information sources, friends, and information seekers (Java et al., 2007). Information sources provide news, regularly or infrequently but have a large following. Friends can be friends, family or co-workers etc., and information seekers generally follow others regularly (Java et al., 2007). Users can participate in many ways such as asking questions, giving opinions, changing ideas, sharing resources, and reflecting (Ebner et al., 2010) and these are grouped into communications such as daily chatter, conversations, sharing of information/URLs, and reporting news (Java et al., 2007).

Popular Microblogging services include Twitter, Yammer, and Sina Weibo.

4.2.1.6 Concept 5: Blogs

Blogs (their name derived from Weblogs) are the oldest form of social media platforms, and have evolved into a powerful information medium (Tredinnick, 2006; Jiang and Wang, 2009; Kaplan and Haenlein, 2010). They can be considered as a special type of website, and when initially introduced they were seen as a way for users to easily publish information to the web and have grown from being public diaries to providing general information about topics the user wishes to discuss (Tredinnick, 2006; Jiang and Wang, 2009; Kaplan and Haenlein, 2010). A blog consists of a post created by the blogger, that is visible to the public when published, that appears in a reverse-chronological order, with a comments section underneath for feedback and discussion of the post (Godwin-Jones, 2003; Cheng and Mirchandani, 2009; Jiang and Wang, 2009; Kaplan and Haenlein, 2010). Blog posts can contain text, and be enriched with additional content such as images, videos, and audio (Cheng and Mirchandani, 2009; Jiang and Wang, 2009). Readers of the blog can then comment on blog entries, and these comments are appended to the bottom of the post (Cheng and Mirchandani, 2009; Jiang and Wang, 2009). There are many blogging communities on the web, which are characterised by locations, ages, genders, occupations, themes etc. (Jiang and Wang, 2009).

Popular Blogging services include WordPress, Blogger, and Tumblr.

4.2.1.7 Concept 6: Content Communities

Content communities consist of users sharing media content between one another (Kaplan and Haenlein, 2010). Content consists of text, videos, photos, and/or presentations (Kaplan and Haenlein, 2010), but often needs some form of hardware/software in order to generate it, e.g. a recording device is needed for video, a camera or image creation software for images, and presentation software for presentations. Users participate by uploading, and sharing content, and viewing content that others have put online (Duffy, 2008). Users can upload and/or view the content through mobile devices and computers at any time.

Users can create personal profiles on these websites also, but this usually only consists of basic information such as a username, the date they joined and the content they have uploaded (Kaplan and Haenlein, 2010). These profiles are being changed though to allow users to subscribe to other user profiles, and vice versa, in order to communicate. Then communications occur in multiple ways, such as through a general comments section under the content that has been provided; by responding to other users with content themselves; or by sharing content to other social media platforms.

Popular content community sites include YouTube for videos, Flickr for photos, and Slideshare for presentations.

4.2.1.8 Summary

There are six types of social media platforms that can be identified in the IS literature, which are presented in Table 4-3, with an explanation of each type, and also some real world examples.

Platform	Explanation	Examples
Social Networking Sites	Platforms that enable users to connect by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sharing content between each other.	Facebook MySpace Google+
Virtual Worlds	Platforms that enable immersive 3D environments, in which users are represented by avatars, and are able to navigate, communicate, collaborate, and trade with other users.	Second Life Habbo Hotel World of Warcraft
Collaborative Projects	Platforms that enable the joint and simultaneous creation of content by many end-users, where it is believed that the joint effort of many users leads to a better outcome than any actor could achieve individually.	Wikipedia Reddit Delicious
Microblogs	Platforms derived from blogging, users create a profile and are then able to publish information about their activities, opinions and status, with a character limit on the message of 140-200 characters.	Twitter Yammer Sina Weibo
Blogs	The earliest form of social media platforms, which are special types of websites that usually display date-stamped entries in reverse chronological order, and allow other users to add comments to the posts.	WordPress Blogger Tumblr
Content Communities	Platforms that allow users upload, share, and view content, such as photos, videos, and presentations. Users can interact by leaving comments under the content.	YouTube Flickr Slideshare

Table 4-3: Social Media Platforms

These different social media platforms share a number of characteristics. The next section introduces what these characteristics are, and explains each one from the IS literature.

4.2.2 Social Media Characteristics: A Literature Review

There is currently a tentative agreement in the IS literature on what some of the characteristics of social media are (Larson and Watson, 2011) but with different researchers contributing additional ones. For example Ali-Hassan and Nevo (2009) identify them as content, source and contribution, technology, and purpose, while Soliman and Beaudry (2010) identify them as bottom-up adoption, user generated content, and increased social interaction. This is an issue for research conducted on social media, as little agreement on the conceptual underpinnings of the topic may lead to conflicting findings across the domain. Furthermore, failing to engage in this conceptual clarification may lead to research on social media being treated as a black box, which will even further exasperate these conflicting consequences (Stenmark, 2008). Therefore the underpinning characteristics of social media need to be discovered, explained, and understood, but first the methodology for the literature review is introduced.

4.2.2.1 A Literature Review Methodology

The methodology for conducting a literature review, introduced in Chapter 1, was applied to identify the characteristics of social media. The aim of this literature review was to identify the characteristics, and offer an explanation of each one. Table 4-4 presents the steps for this literature review, where a total of 476 social media articles were identified from the years 2000-2014 from the initial search, referred to as Iteration 1. This involved identifying articles that contained any of the key words that were highlighted as being relevant (and when new words were highlighted, the search was started over). From here, a detailed review was undertaken of the abstracts and keywords of each one identified, referred to as Iteration 2. This review was used to identify articles that would help provide an understanding of each social media characteristic. This resulted in 210 of these articles being used to create the social media concept centric matrix. This concept matrix was then synthesised to provide an explanation of the social media characteristics.

Phase	Step	Outcome
1. Selecting the Sources	Specify the domain of interest.	Social Media
	Identify relevant sources for selected domain.	Conferences: AMCIS; ICIS; ECIS Journals: Senior Scholars' Basket of Journals
2. Search Strategy	Identify key search terms.	Social Media; Social Technologies; Social Computing; Web 2.0; Wiki; Microblogs; Blogging; Social Networks; Social Communities; Content Communities; Virtual Worlds
	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their *"title"*, *"abstract"* or *"keywords"* section.	Conferences: 124 AMCIS Articles; 116 ICIS Articles; 137 ECIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 16 ISR Articles; 13 JIT Articles; 19 JMIS Articles; 14 JAIS Articles; 20 MIS Quarterly Articles: 2 JSIS Articles
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	Conferences: 95 AMCIS Articles; 87 ECIS Articles; 111 ICIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 13 ISR Articles; 6 JIT Articles; 13 JMIS Articles; 10 JAIS Articles; 18 MIS Quarterly Articles: 0 JSIS Articles
3. Coding Schemes	Determine what is going to be captured from the pool of articles.	Social media characteristics
4. Article Review	Read the articles, and capture the required data.	Concept centric matrix for social media
5. Analysis and Write Up	Analyse the gathered data, and report findings.	Explanation of each social media characteristic

Table 4-4: Literature Review of Social Media Characteristics

Five characteristics were identified during this literature review: *Social Interaction*; *Social Collaboration*; *Content Sharing*; *User Generated Content*; and *Social Connectedness*. An explanation of each of one is presented in the following sections, where the concept matrix that was created above is drawn on. *Social Interaction* was the most observed characteristic, and is introduced first in the next section.

4.2.2.2 Concept 1: Social Interaction

The World Wide Web was originally setup to allow users interact with each other online (Tredinnick, 2006; Stenmark, 2008; Kaplan and Haenlein, 2010) but a sender-receiver relationship was adopted instead. This consisted of a sender who went through a rigorous editing process of content before it was put online, and a receiver who then consumed this content (Stenmark, 2008). Social media has helped transform this relationship, by affording a multi-directional flow of interactions can now occur (Boateng et al., 2009; Pole et al., 2011; Richter and Schäfermeyer, 2011), independent of time and place (Maier et al., 2011; Richter and Schäfermeyer, 2011). These interactions are social in nature, as users are encouraged to interact and engage with each other (García-Crespo et al., 2010; Patel, 2011; Thambusamy and Nemati, 2011; Yin et al., 2011; Goel et al., 2013; Moser et al., 2013; Subramaniam and Nandhakumar, 2013; Kane et al., 2014), which transcends them from mere content consumers, and posits them as content creators also. These interactions allow users to get the feeling of support and togetherness from other users (Krasnova et al., 2008; Shen et al., 2010). *Social Interaction is defined as communications between users, which can occur multi-directionally.*

4.2.2.3 Concept 2: Social Collaboration

Social media platforms are designed to enable collaboration (Boateng et al., 2009; Shen et al., 2010; Pole et al., 2011; Aral et al., 2013; Kane et al., 2014), where users collaborate in the generation, editing, and sharing of content (Seo and Rietsema, 2010). This opportunity to collaborate is enacted by users at various levels of participation (Grigore and Rosenkranz, 2011), both for hedonic and functional purposes (O'Riordan et al., 2011). These collaborations occur in communities that users are organising themselves (Allen et al., 2007), that have similar interests and shared values, where trust is the driving force behind participation (Wu et al., 2010;

Grigore and Rosenkranz, 2011). Users in these communities are encouraged to contribute. As trust between users increases, so too does collaboration (Wu et al., 2010; Grigore and Rosenkranz, 2011), which allows the community to evolve. As these communities evolve, a knowledge repository is built up (Pole et al., 2011), allowing social media to become information exchange platforms. *Social Collaboration is defined as users interacting to generate, edit, and share content, out of necessity.*

4.2.2.4 Concept 3: Content Sharing

Social media platforms are changing the structures by which information is exchanged on the web (García-Crespo et al., 2010; Segrave et al., 2011). This is due to a more democratic, and bottom-up approach to delivering content rather than a top-down approach (García-Crespo et al., 2010; Richter and Schäfermeyer, 2011). *Content Sharing* involves a user sharing content, which can come in many forms such as text, video, audio, images, or links, (Sledgianowski and Kulviwat, 2009; O'Riordan et al., 2011; Helms et al., 2012; Salehan et al., 2013; Zeng and Wei, 2013) and in turn can then be consumed, interpreted, and questioned by other users in the community (Zeng and Wei, 2013). *Content Sharing* is not guaranteed to occur unless the users in the community are willing to participate. Users are likely to continue to share content with each other as long as their participation results in informational value (Cheung and Lee, 2007; Hu and Kettinger, 2008; Wang et al., 2009). While *Content Sharing* offers the possibility of knowledge sharing, it does not guarantee it (Cheung and Lee, 2007) but offers the possibility for it to occur. Further to this, another aspect of *Content Sharing* is that of content seeking, where users use communities as one of their main resources from which to seek content (Meng and Gong, 2009). *Content Sharing is defined as users sharing content (text, video, links, etc.) that other users can consume, and share.*

4.2.2.5 Concept 4: User Generated Content

Since the inception of Web 2.0, and two-way communication, there has been an exponential growth of *User Generated Content* on the web (Ferneley et al., 2009; Goh et al., 2013; Zeng and Wei, 2013). *User Generated Content* consists of the creation and sharing of content by users in a community, where they are active content producers (Kuikka and Äkkinen, 2011; Dewan and Ramaprasad, 2014; Scott and Orlikowski, 2014), instead of just content consumers. For content to be considered as *User Generated Content*, users must adhere to three basic requirements: the content must be published to a social media platform that is accessible to others; the content must be original, or building on previous content; and it must be created outside of professional practices (Vickery and Wunsch-Vincent, 2007). This ensures that when users themselves need content, it is created on a blank page (Tredinnick, 2006). *User Generated Content is defined as a user creating original content, or building on previously shared content.*

4.2.2.6 Concept 5: Social Connectedness

Social media platforms provide users with a heightened way of connecting (Kane and Fichman, 2009; Kreps, 2010; Riemer et al., 2011). As users contribute more, there is an improved likelihood of further user connections being built and strengthened (Cheung and Lee, 2007; Husin and Hanisch, 2011). *Social Connectedness* therefore represents *"the quality and number of connections an individual has with other people in their social circle"* (Goswami et al., 2010, p.3). However, not all connections are equal – the strength is measured as strong ties, weak ties, and latent ties, consisting of the dimensions of time, emotional intensity, intimacy, and reciprocity (Schaefer, 2008; Chai et al., 2011). Strong and weak ties refer to the strength of a relationship between two users that has already been established. Latent ties refer to a connection which is technically available, but has yet to be established by some form of interaction (Schaefer, 2008). Strong ties allow for useful information to be transferred, and when trust exists users are more likely to give more useful information, as well as listen to and absorb others information (Cheng and Mirchandani, 2009). Weak and latent ties can also be rich sources of information. Further to this, as users interact more, connections are not only established, but they are strengthened (Husin and Hanisch, 2011), giving users the feeling of being connected (Krasnova et al., 2008). *Social Connectedness is defined as representing the number and quality of connections a user has in their social circle.*

4.2.2.7 Summary

The aim of this literature review was to extract and explain the characteristics that are inherent of social media. In total five characteristics were identified and are explained in Table 4-5. These six characteristics will form part of the SMECLE evaluation framework, under the building block of social media characteristics.

Characteristics	Explanation
Social Interaction	Communications between users, which can occur multi-directionally.
Social Collaboration	Users interacting to generate, edit, and share content, out of necessity.
Content Sharing	Users sharing content (text, video, image, and/or article, etc.) that other users can consume, and share.
User Generated Content	A user creating original content, or building on previously existing content.
Social Connectedness	Represents the number and quality of connections a user has in their social circle.

Table 4-5: Social Media Characteristics

Following the understanding of each of these characteristics, it is necessary to also extract and explain the characteristics of collaborative learning for the SMECLE evaluation framework, and this is presented next.

4.2.3 Collaborative Learning Characteristics: A Literature Review

While collaborative learning is a much older topic than social media, there were no definitive characteristics found in the IS literature. For the construction of the evaluation framework, these are required. Therefore, similar to the previous section, the underpinning characteristics of collaborative learning need to be discovered, explained, and understood, but first the methodology for the literature review is introduced.

4.2.3.1 A Literature Review Methodology

The methodology for conducting a literature review, introduced in Chapter 1, was applied to identify the characteristics of collaborative learning. The aim of this literature review was to identify the characteristics, and offer an explanation of each one. Table 4-6 presents the steps for this literature review, where a total of 200 collaborative learning articles were identified from the years 1984-2014 from the initial search, referred to as Iteration 1. This involved identifying articles that contained any of the key words that were highlighted as being relevant (and when new words were highlighted, the search was started over). From here, a detailed review was undertaken of the abstracts and keywords of each one identified, referred to as Iteration 2. This review was used to identify articles that would help provide an understanding of each collaborative learning collaborative learning concept centric matrix. This concept matrix was then synthesised to provide an explanation of the collaborative learning characteristics.

Phase	Step	Outcome
1. Selecting the Sources	Identify relevant sources for selected domain.	Collaborative Learning
	Identify key search terms.	Conferences: AMCIS; ICIS; ECIS Journals: Senior Scholars' Basket of Journals
2. Search Strategy	Iteration 1: Search each identified source, identifying articles that contain any of the keywords in their *"title"*, *"abstract"* or *"keywords"* section.	Collaborative Learning; Collaborative Learning Environments; Online Collaboration; Electronic Collaboration; Collaborative Theories; Collaborative Technologies; Collaborative Environment; ICT Collaboration, Collaborative Work Systems; Collaborative Information Technologies; Collaborative Work; Groupware
	Iteration 2: Conduct a detailed review of the abstract and keywords of the initial pool of articles.	Conferences: 124 AMCIS Articles; 116 ICIS Articles; 137 ECIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 16 ISR Articles; 13 JIT Articles; 19 JMIS Articles; 14 JAIS Articles; 20 MIS Quarterly Articles: 2 JSIS Articles
	Determine what is going to be captured from the pool of articles.	Conferences: 95 AMCIS Articles; 87 ECIS Articles; 111 ICIS Articles Journals: 4 EJIS Articles; 11 ISJ Articles; 13 ISR Articles; 6 JIT Articles; 13 JMIS Articles; 10 JAIS Articles; 18 MIS Quarterly Articles: 0 JSIS Articles
3. Coding Schemes	Read the articles, and capture the required data.	Collaborative learning characteristics
4. Article Review	Analyse the gathered data, and report findings.	Concept centric matrix for collaborative learning
5. Analysis and Write Up	Identify relevant sources for selected domain.	Explanation of each collaborative learning characteristic

Table 4-6: Literature Review of Collaborative Learning Characteristics

Five characteristics were identified during this literature review: *Active Learning*; *Group Participation*; *Role of the Instructor*; *Learner Diversity*; and *Learner Relationships*. An explanation of each of one is presented in the following sections, where the concept matrix that was created above is drawn on. *Active Learning* was the most observed characteristic, and is introduced first in the next section.

4.2.3.2 Concept 1: Active Learning

Active Learning is the process of engaging learners with a problem-solving task that has been designed to promote learning (Wiener, 1986; Smith and McGregor, 1992; Bruffee, 1999; Dillenbourg, 1999; Panitz, 1999; Alavi et al., 2002; Neville et al., 2005). Here the problem is understood to be a gap between an actual and desired result, where learners go through a constructive and iterative process of interaction and negotiation to reduce this gap (Smith and McGregor, 1992; Alavi et al., 1995; Leidner and Jarvenpaa, 1995; Dillenbourg et al., 1996; Finnegan and O'Mahony, 1996; Durán and Amandi, 2011). The outcome is some form of a product that is based on shared understandings, and can be a solution, a meaning or a desired performance (Smith and McGregor, 1992; Kotlarsky and Oshri, 2005; Brown et al., 2010). Learning then occurs through this active participation of learners, rather than just passive acceptance from an expert (Smith and McGregor, 1992; Leidner and Jarvenpaa, 1993; Matthews et al., 1995; Panitz, 1999; Kirschner, 2001). And this active participation is achieved by *"engaging students in constructing knowledge by acquiring, generating, analysing, manipulating, and structuring information"* (Alavi, 1994, p.161) where the outcome is a solution to the problem (Wiener, 1986; Smith and McGregor, 1992; Kotlarsky and Oshri, 2005; Brown et al., 2010). Further to this, engaging learners in *Active Learning*, leads to higher level, critical thinking skills being developed (Gokhale, 1995; Matthews et al., 1995; Neville et al., 2005). However, with the current traditional learning environment, it is difficult to introduce an *Active Learning* environment (Neville et al., 2005). *Active Learning is defined as learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task.*

4.2.3.3 Concept 2: Group Participation

Group Participation involves learners interacting with each other in groups (Wiener, 1986; Panitz, 1996; Bruffee, 1999; Dillenbourg, 1999; Kirschner, 2001; Kotlarsky and Oshri, 2005; Durán and Amandi, 2011). Here, groups consist of sizes between two or more learners (Smith and McGregor, 1992), where this can be interpreted as *"a pair, a small group (3-4 subjects), a class (20-30 subjects), a community (a few hundred or thousands of people), and a society (several thousands or millions of people)"* (Dillenbourg, 1999, p.1). For collaborative learning, learners should be grouped into small groups (3-4 subjects) (Wiener, 1986; Alavi, 1994; Bruffee, 1999; Kirschner, 2001). Learners then participate in problem-solving tasks, where they interact with their group members by working together (Alavi, 1994; Alavi et al., 1995; Dillenbourg, 1999; Kirschner, 2001; Franceschi et al., 2009; Durán and Amandi, 2011). The difference between a collaborative group, and a normal group, is that the former the problem to be solved forces the group into consensual learning, where learners must ask questions, justify their opinions, listen to others and as a group, reach a negotiated consensual answer that solves the problem (Wiener, 1986; Alavi et al., 1995; Bruffee, 1995; Matthews et al., 1995; Finnegan and O'Mahony, 1996; Mejias et al., 1997; Kwok et al., 2002; Bajwa et al., 2005; Durán and Amandi, 2011). Learning then occurs from group member's ability *"to monitor each other's thinking, opinions, and beliefs, while also obtaining and providing feedback for clarification and enhancement of comprehension"* (Alavi et al., 2002, p.405). The group must then share their findings to the bigger group, the class as a whole, to show and teach the knowledge that they have created (Wiener, 1986; Bruffee, 1999). *Group Participation is defined as groups of 3-4 learners asking questions, justifying opinions, listening to others, and through negotiation, reaching a consensual answer.*

4.2.3.4 Concept 3: Role of the Instructor

The current role of an instructor is that of a *"sage on the stage"*, where they are seen as the expert in a teacher-centred classroom, passing knowledge onto learners (Smith and McGregor, 1992; Matthews et al., 1995; Panitz, 1999; Kirschner, 2001; Neville et al., 2005). However with collaborative learning, this role changes significantly.

The role focuses more on facilitating learners by putting the responsibility of learning with them (Panitz, 1999; Kwok et al., 2002; Neville et al., 2005). Here, instructors focus more on designing problem-solving tasks for the learners to solve, than on acting as transmitters of knowledge (Smith and McGregor, 1992; Gokhale, 1995; Leidner and Jarvenpaa, 1995; Kwok et al., 2002; Neville et al., 2005). Therefore the instructor is responsible for being actively present, trusting the learners to engage in conversation and negotiation, and when required providing minimal guidance (Bruffee, 1999; Dillenbourg, 1999; Kane and Fichman, 2009). This guidance involves refraining from interfering with groups, and when this is unavoidable, asking questions to the group (Bruffee, 1999). However it is important to acknowledge that the role of the instructor is not being diminished, but merely shifting from *"resident expert"* to a *"qualified guide"*, as tasks such as holding lectures, assigning projects, and creating exams will still be necessary (Kwok et al., 2002; Kane and Fichman, 2009). *Role of the Instructor is defined as the instructor providing a task to be completed, and offering qualified guidance when required.*

4.2.3.5 Concept 4: Learner Diversity

Learners bring much diversity to the classroom and as a result also to the group. Diversity consists of surface-level and deep-level diversity (Arazy et al., 2011). Surface-level diversity deals with demographic differences, such as learner's backgrounds (Smith and McGregor, 1992; Gokhale, 1995; Arazy et al., 2011). Deep-level diversity deals with educational background, learning styles, experiences, knowledge, and aspirations (Smith and McGregor, 1992; Gokhale, 1995; Arazy et al., 2011), and as Schutz (1967) has indicated, individuals with such diversity will draw radically different meanings from information. But it is this ability to draw on the group's diversity, through intersubjective interpretation, that allows collaborative groups to *"construct richer interpretations of task-related information and devise more complex solutions"* (Miranda and Saunders, 2003, p.92). Therefore, these diversities can contribute positively to the learning process (Gokhale, 1995). Further to this, the learner's experience of working in a diverse group leads to essential experience for the multicultural democracy that we now live in (Matthews et al., 1995; Kirschner, 2001). *Learner Diversity is defined as diversity in a group (because* *of learner's background), allowing learners to draw different perspectives on task-related information.*

4.2.3.6 Concept 5: Learner Relationships

Learning is shared between instructors and learners, where a number of relationships are formed, from learner to learner, learner to instructor, and instructor to learner (Matthews et al., 1995; Bruffee, 1999; Panitz, 1999; Kirschner, 2001). These relationships are formed through interactions between participants (Kreijns et al., 2003), and are an expansion of learning in traditional environments of the instructor to learner relationship (Leidner and Jarvenpaa, 1995; Bruffee, 1999; Panitz, 1999). These relationships encourage learners to build closer relationships through negotiation with other learners, their instructors, and ultimately the larger community in which they are trying to join (Smith and McGregor, 1992; Bruffee, 1995; Bruffee, 1999). They are built on trust, where participants foster faith that all others will contribute rather than behaving opportunistically (Brown et al., 2004). The instructor is then responsible for validating the information gathered by learners, with what is the consensus of the larger community in which they wish to join, and helping them complete this movement (Wiener, 1986; Bruffee, 1999). Therefore learning occurs between learners, between learners and instructor, between instructor and learners, and finally between learners, instructor and the community (Wiener, 1986; Bruffee, 1999; Panitz, 1999; Kane and Fichman, 2009). *Learner Relationships are defined as Relationships that are expanded from instructor-to-learner, to include learner-to-learner, and learner-to-instructor relationships, where learning is multidirectional.*

4.2.3.7 Summary

The aim of this literature review was to extract and explain the characteristics of collaborative learning. In total five characteristics were identified and are explained in Table 4-7. These five characteristics are the final part of the SMECLE evaluation framework, under the building block of collaborative learning characteristics.

Platform	Explanation
Active Learning	Learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task.
Group Participation	Groups of 3-4 learners asking questions, justifying opinions, listening to others, and through negotiation, reaching a consensual answer.
Role of the Instructor	The instructor providing a task to be completed, and offering qualified guidance when required.
Learner Diversity	Diversity in a group (because of learner's background), allows learners to draw different perspectives on task-related information.
Learner Relationships	Relationships are expanded from instructor-to-learner, to include learner-to-learner, and learner-to-instructor relationships, where learning is multidirectional.

Table 4-7: Collaborative Learning Characteristics

Following the understanding of each of these characteristics, along with the characteristics of social media, and the platforms of social media, the SMECLE evaluation framework now has the three building blocks necessary to build it, which is presented in the next section.

4.3 Phase 1: Building the SMECLE Evaluation Framework V1.0

The SMECLE evaluation framework was built with the three building blocks identified in the design phase in section 4.2, and is presented in Figure 4-1. **Social media platform** describes the social media platform that is going to be utilised for the learning environment. **Social media characteristics and collaborative learning characteristics** are the characteristics that were identified from the review of the IS literature. By putting these building blocks together, a matrix that juxtaposes the five characteristics of social media against the five characteristics of collaborative learning, creates, on a single page, an evaluation framework to help analyse if the social media platform is enabling collaborative learning to occur. This matrix creates twenty-five relationships that require different rules to act as indicators to whether an instance of an intersection between two characteristics has occurred but before these are created, an understanding of what the task element of the framework entails is introduced.

			Task				
			Collaborative Learning Characteristics				
			Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Social Media Platform	Social Media Characteristics	Social Interaction	1.1	1.2	1.3	1.4	1.5
		Social Collaboration	2.1	2.2	2.3	2.4	2.5
		Content Sharing	3.1	3.2	3.3	3.4	3.5
		User Generated Content	4.1	4.2	4.3	4.4	4.5
		Social Connectedness	5.1	5.2	5.3	5.4	5.5

Figure 4-1: SMECLE Evaluation Framework V1.0

Task

In a collaborative learning environment, the instructor must set an open-ended task that has no definitive answer (Leidner and Jarvenpaa, 1993; Bruffee, 1999; Panitz, 1999; Alavi et al., 2002; Kwok et al., 2002; Kotlarsky and Oshri, 2005; Brown et al., 2010). This task should be created with a number of criteria in mind: the learning environment, the knowledge of the learners, and the time they have to solve the task. In terms of the learning environment, the task should be defined around the resources that are available to the learner, i.e. is it face-to-face or a dispersed setting; do they have access to course material; do they have access to the internet? Depending on what is available, the task must de designed around it. For example it would be inappropriate to ask students to review Wikipedia as an informational website if in the CLE they did not have access to the website.

Next, the knowledge of the learners must be considered. The task is going to focus on a topic(s), and if the learners do not have a foundational knowledge of the topic, their solutions to the task will more than likely not be of an acceptable standard. This is why the instructor is required to introduce the learners to any topic first, providing them with the foundational knowledge of the topic, so they can then communicate with each other with the right language. Then the task is designed to help them actively add to this foundational knowledge by seeking more information themselves and provide an answer for the task.

Finally, the instructor needs to consider the amount of time that is available to complete the task. Sufficient time is required to allow learners to read and understand the task, discuss the task with their fellow group members, and begin to develop their solution. For example it would not be sufficient to ask learners to develop a solution to a JavaScript If Statement coding exercise in one hour if they have just been introduced to the concept of If Statements. Finally, learners should present the answers they create to the class. With the twenty-five potential relationships that can occur in the evaluation framework, rules need to be created to act as indictors to whether an instance of an intersection between two characteristics has occurred, which are created next.

Creating the Evaluation Framework Rules

The next step is to create rules for each of the twenty-five cells so an occurrence of a social media characteristic enabling a characteristic of collaborative learning can be identified. Without such rules data could not be categorised. Therefore, base rules need to be identified, and this is best achieved by understanding each social media characteristic, and how they may enable any of the collaborative learning characteristics. The rules are created based on the intersection of where the social media characteristic enables the characteristics of collaborative learning, and are presented in Figure 4-2. Here we can see the SMECLE evaluation framework, the explanation for each characteristic, and from these explanations rules were created as base assumptions for each of the twenty-five cells.

For example, the first characteristic of social media, *Social Interaction*, is defined as "*Communications between users, which can occur multi-directionally*". From this definition, it is understood that communication over a SMP involves learners interacting by making comments, and this can potentially enable any of the five collaborative learning characteristics. A rule must therefore be created to understand what comments enable which collaborative learning characteristic.

For *Active Learning* to occur, learners must participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. It is therefore understood, for *Social Interaction* to enable *Active Learning*, an appropriate base rule is:

> *A learner makes a comment.*

This differs to how *Social Interaction* enables *Group Participation*, which is defined as "*Groups of 3-4 learners asking questions, justifying opinions, listening to others, and through negotiation, reaching a consensual answer"*. A learner still makes a comment, but in order for it to enable *Group Participation*, it would require an interaction with at least one other group member. For a *Social Interaction* to enable *Group Participation*, an appropriate base rule is:

> *A learner makes a comment, and at least one group member acknowledges it.*

The instructor is also able to make comments, and this is part of their role, defined as "*The instructor provides a task to be completed, and offers qualified guidance when required"*. Here, when the instructor makes a comment, the *Social Interaction* is enabling the *Role of the Instructor*, so an appropriate base rule is:

The instructor makes a comment.

A *Social Interaction* can enable *Learner Diversity*, defined as *"Diversity in a group (because of learner's background), allows learners to draw different perspectives on task-related information"*. This occurs when a learner's makes a comment, but also refers to their background. Therefore for a *Social Interaction* to enable *Learner Diversity*, an appropriate base rule is:

A learner makes a comment, drawing on their diversity.

Learner Relationships are defined as *"Relationships are expanded from instructor-to-learner, to include learner-to-learner, and learner-to-instructor relationships, where learning is multidirectional."* and when a *Social Interaction* occurs, it is deemed that these relationships are initially formed, and then strengthened as further interactions occur. So for a *Social Interaction* to enable *Learner Relationships*, an appropriate base rule is:

A relationship is formed or strengthened based on a comment.

The rules for all twenty-five of the cells were created in this manner, and are presented in Figure 4-2.

				Task				
				Collaborative Learning Characteristics				
				Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
				Learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task.	**Groups of 3-4 learners asking questions, justifying opinions, listening to others, and through negotiation, reaching a consensual answer.**	**The instructor provides a task to be completed, and offers qualified guidance when required.**	**Diversity in a group (because of learner's background), allows learners to draw different perspectives on task-related information.**	**Relationships are expanded from instructor-to-learner, to include learner-to-learner, and learner-to-instructor relationships, where learning is multidirectional.**
Social Media Platform	**Social Media Characteristics**	Social Interaction	**Communications between users, which can occur multi-directionally.**	A learner makes a comment.	A learner makes a comment, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor makes a comment.	A learner makes a comment, drawing on their diversity.	A relationship is formed/strengthened based on a comment.
		Social Collaboration	**Users interacting to generate, edit, and share content, out of necessity.**	A learner asks another learner(s) a question. or A learner agrees/disagrees with another learner(s).	A learner asks another learner(s) a question(s), and they acknowledge it, and a consensual answer is reached. or A learner agrees/disagrees with another learner (s), and they acknowledge it, and a consensual answer is reached.	The instructor asks a learner(s) a question. or The instructor agrees/disagrees with a learner(s).	A learner asks another learner(s) a question, drawing on their diversity. or A learner agrees/disagrees with another learner(s), drawing on their diversity.	A relationship is formed/strengthened from asking questions or A relationship is formed/strengthened from agreeing/disagreeing with the content.
		Content Sharing	**Users sharing content (text, video, links, etc.) that other users can consume, and share.**	A learner shares content (text, video, image, or link).	A learner shares content (text, video, image, or link), and at least one group member acknowledges it, and a consensual answer is reached.	The instructor shares content (text, video, image, or link).	A learner shares content (text, video, image, or link), drawing on their diversity.	A relationship is formed/strengthened based on the sharing of content.
		User Generated Content	**A user creating original content, or building on previously existing content.**	A learner creates, and shares some original content.	A learner creates, and shares some original content, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor creates, and shares some original content.	A learner creates, and shares some original content, drawing on their diversity.	A relationship is formed/strengthened based on creation and sharing of some original content.
		Social Connectedness	**Represents the number and quality of connections a user has in their social circle.**	A connection is created/strengthened as learners actively learn together.	A connection is created/strengthened as learners communicate with each other.	A connection is created/strengthened as an instructor communicates with a learner.	A connection is created/strengthened as learners communicate, drawing on their diversity.	A connection is created/strengthened as user's relationships are strengthened.

Figure 4-2: SMECLE Evaluation Framework V1.0 with Rules

With these rules created, the design and build phase for the SMECLE evaluation framework V1.0 was complete. To be able to evaluate it for its effectiveness, data needs to be gathered from a SMECLE. The following section explains how to set up a SMECLE, and then the methodology for how the framework can be utilised is introduced.

How to Utilise the SMECLE Evaluation Framework

To be able to utilise the evaluation framework, there are three steps that need to be followed:

1. SMECLE Setup
2. Gather the Data
3. Analyse the Data

First, data needs to be collected from a SMECLE, which requires a SMECLE to be set up and run. This data then needs to be gathered, and converted into a data set. The data set is then analysed with the evaluation framework.

Step 1: SMECLE Setup

A SMECLE is setup by applying the design principles for CLEs (from section 3.6.2), with consideration for the SMP being used, which are presented in Table 4-8. Once the environment is set up, the SMECLE is run for a time frame set by the instructor. As students participate during that set time, data is gathered to be analysed with the evaluation framework.

Step	Explanation
1.	The Instructor chooses a social media platform to use.
2.	The instructor creates the rules that the learners should work within.
3.	The instructor sets up their SMP account.
4.	The instructor creates the groups of 3-4 members and this list should be provided to the learners.
5.	The instructor creates the task that must be completed – this will be dictated by how long they wish the class to go on for, where the more time they assign, the more challenging the task.
6.	The learners create accounts for the SMP being used.
7.	Learners connect their accounts with other learners if necessary

Table 4-8: Steps for Creating a SMECLE

Step 2: Gather the Data

To create a data set, all the posts made in a SMECLE need to be aggregated into one file - this entails *"scraping"* the data from the SMP. The data that is necessary to scrape is dependent on the SMP being used, but should include: Group (group number of the poster); User (username of the poster); Date (the date the post was created); Time (the time the post was created); Post (the text of the actual post); Impression (the initial impression of the analyst of what the post entails).

In addition to this data, a coding scheme needs to be applied to each post, so each one can be referenced individually. This is achieved by creating a code based on the group number of the learner who created the post, and counting what number post it was, e.g. in a microblog enabled CLE, G4T5 is the fifth tweet of group four. Finally, a unique numbered key should be added to the rows so it can be easily manipulated and then returned to its original state. Once the file has been created, the data is scraped from the SMP. An example of a data set is presented in Figure 4-3.

Two further columns are then added to the data set to be able to capture the instances at which a social media characteristic enables a characteristic of collaborative learning: Framework Tags (the name of the two characteristics where the post agrees with the rule(s)); Cell Number (the number of the cell in the framework).

Key	Group	Code	Date	Time	Tweet	Impression
10	Group 1	G1T8	17/01/2012	3.17pm	For Group 1, can we all change the group to be the same, eg #Group1 (hash and no spaces).	Another user of the group takes control, again attempting to get the others to use the same tag (#Group1) so they can communicate better. He even explains how to use it.
11	Group 1	G1T9	17/01/2012	3.17pm	#G1 We could take the following http://en.wikipedia.org/wiki/Outsourcing ... - check out see also section	This user continues to use the tag he created (G1) ignoring the calls from the other user. And another link is provided, this time to the wiki page about outsourcing
12	Group 1	G1T10	17/01/2012	3.18pm	@ISBP111223725 no problem	User appropriates the functional affordance of tweeting at someone, and acknowledges that the group should all use the #Group1 tag
13	Group 1	G1T11	17/01/2012	3.19pm	@ISBP111223725 Sure no problem, we can stick to that so.	User appropriates another functional affordance, this time by tweeting at a group member. There is now a consensus between three of the group members on using the same tag for the groups tag (#Group1).

Figure 4-3: Sample SMECLE Data Set

Step 3: Analyse the Data

Analysing the data entails reading each post that has been captured in the data set, and based on the rules of each cell in the evaluation framework, deciding whether the post complies with any of them, and therefore an instance of a social media characteristic enabling a characteristic of collaborative learning. If an instance is deemed to have occurred, it is marked into the *"Framework Tags"* column, and the number of the framework cell should be marked into the *"Cell Number"* column, as shown in Figure 4-4. In the second row of Figure 4-4, a learner has shared some content in the form of a link *(Content Sharing)*, complying with the rule of *"Content Sharing, Active Learning"*, which is *"A learner shares content (text, video, image, or link)."* This is therefore considered an instance of *Content Sharing* enabling *Active Learning*, and is marked into the file next to that post, as shown.

A post can also be classified into more than one cell at a time if there are multiple instances of rules being met. For example, the post (which is titled Tweet) in Figure 4-4 not only includes content being shared, but the learner also makes a comment (*Social Interaction*), which is an instance of *"Social Interaction, Active Learning"* as it agrees with the rule *"A learner makes a comment."* This indicates that this post has two instances in the framework. Once each post has been evaluated with the evaluation framework, the instances are counted up for each cell, and added to the evaluation framework cells, providing them with an overview of what social media characteristics enabled collaborative learning characteristics in their environment. The next process in DSR is to evaluate the artefact for its usefulness, and to do this with the evaluation framework, a number of SMECLE need to be constructed and run. The next phase introduces the SMECLE cases that will be used to evaluate the evaluation framework.

Tweet	Impression	Framework Tags	Cell Number
#G1 We could take the following http://en.wikipedia.org/wiki/ Outsourcing ... - check out see also section	This user continues to use the tag he created (G1) ignoring the calls from the other user. And another link is provided, this time to the wiki page about outsourcing	Content Sharing, Active Learning	3,1
#G1 We could take the following http://en.wikipedia.org/wiki/ Outsourcing ... - check out see also section	This user continues to use the tag he created (G1) ignoring the calls from the other user. And another link is provided, this time to the wiki page about outsourcing	Social Interactions, Active Learning	1,1
@ISBP111223725 no problem	User appropriates the functional affordance of tweeting at someone, and acknowledges that the group should all use the #Group1 tag	Social Interactions, Group Participation	1,2

Figure 4-4: Sample Data Set

With the SMECLE evaluation framework V1.0 designed and built, and the rules for the cells stated, with the methodology on how to utilise the evaluation framework explained, the next section evaluates the effectiveness of it when evaluating a microblog enabled CLE.

4.4 Phase 1: Evaluating the SMECLE Evaluation Framework V1.0

Analysis of IS6119 with SMECLE Evaluation Framework V1.0

In this phase, the two-step evaluation was executed. First the researcher evaluated the framework for its usefulness. Then, in a two hour evaluation session with two senior educators, the effective, and ineffective, cell rules, and/or cell structures, were discussed. The first data set to be analysed with SMECLE evaluation framework V1.0 is IS6119, which is a microblog enabled CLE. This consisted of 421 tweets, and presented in Figure 4-5 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 13 cells with instances, from a possible 25. From these 13, 10 were demonstrated to comply with the rules. However, the data demonstrated there were 3 cells that the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. Examples of three compatible cells are provided next, followed by an explanation of the three cells that were incompatible, and need to be amended in the next design and build section, in Phase 2.

			#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach				
			Collaborative Learning Characteristics				
			Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Microblog	Social Media Characteristics	Social Interaction	X	X	X		X
		Social Collaboration	X	X			X
		Content Sharing	X	X			X
		User Generated Content	X		X		X
		Social Connectedness					

Figure 4-5: IS6119 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

4.4.1.1 Compatible Cells

The following three examples present data from IS6119 that highlight how they comply with the cell rules, and therefore classify instances of social media characteristics enabling collaborative learning characteristics,

Social Interaction, Group Participation

A *Social Interaction* occurs when a learner makes a comment. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this base rule is that at least two learners need to be involved for *Group Participation*, where if a learner makes a comment, and at least one group member acknowledges it, and they reach a consensual answer, an instance of *"Social Interaction, Group Participation"* has occurred. The rule is set as follows:

Cell	Rule
Social Interaction, Group Participation (1,2)	A learner makes a comment, and at least one group member acknowledges it, and a consensual answer is reached.

Table 4-9: SMECLE Evaluation Framework V1.0 Cell Rule for Social Interaction, Group Participation

An example of this occurring is:

Social Interaction, Group Participation		
Tweet Reference: G4T40	**Learner Name:** @ISBP108824207	**Assessment**
@ISBP107480661 @ISBP111223571 No prob, i'll try to keep track, Do You want to look at strategic Kirstie and i'll go look at off-shore?		A learner makes a comment *(Social Interaction)*, asking another learner a question.
In response to @ISBP108824207		
Tweet Reference: G4T40	**Learner Name:** @ISBP107480661	**Assessment**
K no worries ill take strategic so #group4		This is acknowledged by the other learner, who makes a comment *(Social Interaction)*, agreeing with them, and reaching a consensual answer *(Group Participation)*.

Table 4-10: Phase 3 Compatible Cell of Social Interaction, Group Participation

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this base rule is that if learners ask questions of each other, or agree/disagree with each other, then an instance of *"Social Collaboration, Active Learning"* has occurred. The rule is set as follows:

Cell	Rule
Social Collaboration, Active Learning (2,1)	A learner asks another learner(s) a question. or A learner agrees/disagrees with another learner(s).

Table 4-11: SMECLE Evaluation Framework V1.0 Cells Rule for Social Collaboration, Active Learning

An example of this occurring is:

Social Collaboration, Active Learning		
Tweet Reference: G4T54	**Learner Name:** @ISBP111223139	**Assessment**
@ISBP111223726 ok, do we need to define smart/right outsourcing?		A learner asks their other group members a question *(Social Collaboration)* based on the topics they are defining, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP111223139		
Tweet Reference: G6T55	**Learner Name:** @ISBP111223726	**Assessment**
smart and right are the same as selective		One of the other group members acknowledges the question *(Social Collaboration)* by providing an answer, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-12: Phase 3 Compatible Cell of Social Collaboration, Active Learning

User Generated Content, Role of the Instructor

User Generated Content is original content created by the learner, or building on previously existing content. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this base rule is that if the instructor provides some original content, and they are fulfilling their role, and an instance of *"User Generated Content, Role of the Instructor"* has occurred. The rule is set as follows:

Cell	Rule
User Generated Content, Role of the Instructor (4,3)	The instructor creates, and shares some original content.

Table 4-13: SMECLE Evaluation Framework V1.0 Cell Rule for User Generated Content, Role of the Instructor

An example of this occurring is:

User Generated Content, Role of the Instructor		
Tweet Reference: I1T3	**Learner Name:** @ISBP93260857	**Assessment**
#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach		The instructor creates some original content by creating the task *(User Generated Content)*, and by sending it out they are fulfilling their role as the instructor, as they are providing a task to be completed *(Role of the Instructor)*.

Table 4-14: Phase 3 Compatible Cell of User Generated Content, Role of the Instructor

4.4.1.2 Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of social media characteristics enabling collaborative learning characteristics. Three cells were identified as being ineffective with the IS6119 data set, which are presented in Table 4-15, with the issues explained. To amend these rules, the data that demonstrated them to be ineffective are used in the design, and build section of Phase 2.

Incompatible Cells	Identified Issue
Social Interaction, Active Learning (1,1)	The data from IS6119 indicates that the rule for this cell is too broad. This is because every tweet that is sent results in a comment being made. Also, there is no evidence to show that *Active Learning* is occurring.
Social Interaction, Role of the Instructor (1,3)	The data from IS6119 indicates that the rule for this cell is too broad. Every tweet that the instructor sent related to the task in some way, but it is possible that if they send a tweet non-task related, it would still be classified as an instance, even though the instructor may not be fulfilling their role.
Content Sharing, Active Learning (3,1)	The data from IS6119 indicates that the rule for this cell is too broad. There were a number of tweets where learners shared some content, such as a link to a YouTube clip, but no indication that it was consumed, or understood.

Table 4-15: Incompatible Cells of SMECLE Framework V1.0

4.5 Phase 2: Designing, Building, and Evaluating the SMECLE Evaluation Framework

The purpose of this section is to design and build version two of the SMECLE evaluation framework, and evaluate it with a new data set to test its usefulness. The design, and build section differs to that of SMECLE Framework V1.0, in that the three building blocks for building such a framework were identified in Phase 1 through a literature review. Then, through the evaluation section, these building blocks were demonstrated to be effective for building a SMECLE evaluation framework, but it emerged that three of the cell's base rules were ineffective in analysing the data that was generated during the SMECLE exercise. The design and build sections presented here are therefore informed by the learnings of the evaluation section in Phase 1, with the focus on amending these rules with the aid of the IS6119 data set. The process for evaluating SMECLE evaluation framework V2.0 in Phase 2 remains the same as Phase 1, but a new data set is used. Introduced first is the design and build section.

4.5.1 Designing, and Building the SMECLE Evaluation Framework V2.0

Designing SMECLE Evaluation Framework Version 2.0

To be able to redesign the evaluation framework, the learnings from the evaluation section Phase 1 must be amended, where some rules were demonstrated to be ineffective. This is achieved by analysing the data in IS6119 in Phase 1, it is necessary to first explain what the assumption of the rule is, and the reason(s) why. Then it is required to amend the rule with the data. This process is applied for the three cells identified in Phase 1, and the IS6119 data set is used to amend them. The three cells are:

- *"Social Interaction, Active Learning"*
- *"Social Interaction, Role of the Instructor"*
- *"Content Sharing, Active Learning"*

A retrospective review of the other rules is also carried out, based on the learning that was derived from these three amendments, and is used to update cells where clear anomalies exist.

Amendment 1: Social Interaction, Active Learning

A *Social Interaction* occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner makes a comment, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. The rule was set as follows:

Cell	**Rule**
Social Interaction, Active Learning (1,1)	A learner makes a comment.

Table 4-16: SMECLE Evaluation Framework V1.0 Cell Rule for Social Interaction, Active Learning

In this case, the issue with the rule was proven to be twofold by the IS6119 data. Firstly, it is too broad, as any time a learner sends a tweet, they are making a comment, and therefore all 421 tweets would be classified as an instance of *"Social Interaction, Active Learning"*. Secondly, it fails to consider if *Active Learning* occurs, and instead assumes that all comments made on Twitter result in *Active Learning*. Consider the following two tweets from IS6119:

Example 1

<table>
<tr><th colspan="3">Social Interaction, Active Learning</th></tr>
<tr><td>Tweet Reference:
G2T11</td><td>Learner Name:
@ISBP111223752</td><td>Assessment</td></tr>
<tr><td colspan="2">@ISBP111223752 I'm talking about 'group 2'</td><td>A learner makes a comment (Social Interaction) and tries to get the attention of another learner(s), but mentions their own name instead.</td></tr>
</table>

Table 4-17: Phase 2, Amendment 1: Social Interaction, Active Learning

Example 2

Social Interaction, Active Learning		
Tweet Reference: G7T20	**Learner Name:**	**Assessment**
#Group7 Hey Martin, ya i think we are all taking a different area of outsourcing. Mark, what area are you doing?		A learner makes a comment *(Social Interaction)*, discussing the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-18: Phase 2, Amendment 1: Social Interaction, Active Learning

Under the current rule, each of these tweets would be classified as instances of *"Social Interaction, Active Learning"* as in each one a learner is making a comment. What is evident is that while each one is a *Social Interaction* (a learner making a comment), there is no evidence of *Active Learning* occurring in Example 1 as the learner is not participating in a constructive and iterative process of interaction and negotiation in a problem-solving task, but is instead commenting with themselves. In Example 2 however, the learner is responding to another learner, discussing the task, therefore participating in a constructive and iterative process of interaction and negotiation. The understanding from this is that learners need to be commenting on the task that has been set, trying to discuss and engage with each other about it, to enable *Active Learning*. The rule is amended to:

Cell	Rule
Social Interaction, Active Learning (1,1)	A learner makes a comment in relation to the task.

Table 4-19: SMECLE Evaluation Framework V2.0 Amended Cell Rule for Social Interaction, Active Learning

Amendment 2: Social Interaction, Role of the Instructor

A *Social Interaction* occurs when a learner makes a comment. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this base rule is that when an instructor makes a comment, they are fulfilling their role as the instructor, and an instance of *"Social Interaction, Role of the Instructor"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment.

Table 4-20: SMECLE Evaluation Framework V1.0 Cell Rule for Social Interaction, Role of the Instructor

In this case, the issue is with the broadness of the rule. The instructor's role is to set the task, and guide students if they require it. As the rule currently is, this would not be the case, as any comment made by the instructor would be classified as an instance of *"Social Interaction, Role of the Instructor"*. While there were no instances of this occurring in the IS6119 data set, there was a trend in the data of what the instructor was tweeting about. Consider the following tweets from IS6119:

Example 1

Social Interaction, Role of the Instructor		
Tweet Reference: I1T4	**Learner Name:** @ISBP93260857	**Assessment**
@ISBP106681379 @ISBP111221319 @ISBP111223726@ISBP111223139 keep all of your definitions on twitter		The instructor makes a comment *(Social Interaction)* towards some learners of a group, and is instructing them on how they should provide an answer to the task *(Role of the Instructor).*

Table 4-21: Phase 2, Amendment 2: Social Interaction, Role of the Instructor

Example 2

Social Interaction, Role of the Instructor		
Tweet Reference: I1T6	**Learner Name:** @ISBP93260857	**Assessment**
@isbp103464679 will you pop them on twitter		The instructor makes a comment *(Social Interaction)* towards a learner, and is instructing them on how they should provide an answer to the task *(Role of the Instructor).*

Table 4-22: Phase 2, Amendment 2: Social Interaction, Role of the Instructor

Example 3

Social Interaction, Role of the Instructor		
Tweet Reference: I1T7	**Learner Name:** @ISBP93260857	**Assessment**
To wrap up the task put your definitions up as tweets. Each group will be presenting their definitions briefly in class next Tuesday.		The instructor makes a comment *(Social Interaction)* to the whole class, bringing the class to an end and asking students to complete the task by providing their answers as a tweet *(Role of the Instructor).*

Table 4-23: Phase 2, Amendment 2: Social Interaction, Role of the Instructor

Under the current rule, each of these instances would be classified as instances of *"Social Interaction, Role of the Instructor"* as the instructor is making a comment in each one. However, what is evident from these tweets, is the instructor is in some way referring to the task each time, allowing them to fulfil their role, as opposed to making comments that do not entail the task, and therefore not fulfilling their role. The understanding from this is that the task is important to the comments that the instructor makes in order for them to fulfil their role. Therefore, in order for the instructor to fulfil their role, they would need to be relating to the task, so the rule is amended to:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment in relation to the task.

Table 4-24: SMECLE Evaluation Framework V2.0 Amended Cell Rule for Social Interaction, Role of the Instructor

Amendment 3: Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this base rule is that a learner has actively learned anytime they share content, and an instance of *"Content Sharing, Active Learning"* has occurred. The rule was set as follows:

Cell	Rule
Content Sharing, Active Learning (3,1)	A learner shares content (text, video, image, or link).

Table 4-25: SMECLE Evaluation Framework V1.0 Cell Rule for Content Sharing Active Learning

In this case, the issue is with the broadness of the rule. This is due to the assumption that if a learner shares content, they have found it, consumed it, and shared it, as they think it will help towards solving the task. However, there were numerous instances in IS6119 where learners shared content, but did not make any reference to it, indicating it possible that content can be shared without the learner having actually consumed it, and therefore no *Active Learning* occurring. Consider the following tweets from IS6119:

Example 1

Content Sharing, Active Learning		
Tweet Reference: G1T12	**Learner Name:** @ISBP107348240	**Assessment**
#group1 the see also section on this page seems to have a few categories for outsourcing too http://en.wikipedia.org/wiki/Insourcing. How many will we take?		A learner shares a link to an article *(Content Sharing)* and tells them a specific section to look at, indicating that they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-26: Phase 2, Amendment 3: Content Sharing, Active Learning

Example 2

Content Sharing, Active Learning		
Tweet Reference: G5T35	**Learner Name:** @ISBP106443290	**Assessment**
@ISBP96556021 http://edit752.pbworks.com/f/Outsource_CaseStudies.pdf ... this could be helpful for you Shane		A learner shares a link with another learner *(Content Sharing)* and comments on how it could be helpful for them, indicating that they have already consumed, and understood it, and see it as beneficial to the other learner, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-27: Phase 2, Amendment 3: Content Sharing, Active Learning

Example 3

Content Sharing, Active Learning		
Tweet Reference: G8T16	**Learner Name:** @ISBP94062218	**Assessment**
#Group8, http://www.globalchange.com/outsourcing.htm , is a good link		A learner shares a link with their group *(Content Sharing)* and gives their opinion on it, indicating that they have already consumed, and understood the content, and see it as beneficial to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-28: Phase 2, Amendment 3: Content Sharing, Active Learning

Under the current rule, each of these would be classified as instances of *"Content Sharing, Active Learning"* as a learner is sharing content in each one. However, what is evident from these tweets, is that learners are sharing content that they have found, and making a comment about it, indicating they have consumed it, and understand it, and by sharing it with other group members, they believe it to be beneficial to solving the task. The understanding from this, is that learners need to be sharing content that is in relation to the task, and to indicate that they have consumed, and understood the content, for *Active Learning* occur. The rule is amended to:

Cell	Rule
Content Sharing, Active Learning (3,1)	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it.

Table 4-29: SMECLE Evaluation Framework V2.0 Amended Cell Rule for Content Sharing Active Learning

Retrospective Review of Rules

With these three rules amended, a retrospective review of the other cells was undertaken, reviewing their rules with respect to the new learning that was acquired. This highlighted that all of the base rules failed to take into account that they need to focus on the task that must be completed by the learners. This was a clear anomaly, so *"in relation to the task"* was added to all of the rules. For example:

Cell	Rule
Social Interaction, Group Participation (1,2)	A learner makes a comment, and at least one group member acknowledges it, and a consensual answer is reached.

Table 4-30: SMECLE Evaluation Framework V1.0 Cell Rule for Social Interaction, Group Participation

While no data from IS6119 indicates this is inappropriate, it is evident that it is very broad, so based on the new learning, the rule is amended to.

Cell	Rule
Social Interaction, Group Participation (1,2)	A learner makes a comment in relation to the task, and at least one group member acknowledges it

Table 4-31: SMECLE Evaluation Framework V2.0 Amended Cell Rule for Social Interaction, Group Participation

This was completed prior to building SMECLE evaluation framework V2.0.

Building SMECLE Evaluation Framework Version 2.0

SMECLE Framework V2.0 is presented in Figure 4-6. There are no structural changes to the cells, so it keeps the same appearance, but it is the rules of the cells that have been amended. This framework must now be evaluated by a new data set to test its usefulness, and this is presented next.

Social Media Platform	Social Media Characteristics		Task				
			Collaborative Learning Characteristics				
			Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
		Social Interaction	A learner makes a comment in relation to the task.	A learner makes a comment in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor makes a comment in relation to the task.	A learner makes a comment in relation to the task, drawing on their background.	A relationship is formed/strengthened based on a comment that is in relation to the task.
		Social Collaboration	A learner asks another learner(s) a question in relation to the task. or A learner agrees/disagrees with another learner(s) in relation to the task.	A learner asks another learner(s) a question(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached. or A learner agrees/disagrees with another learner(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor asks a learner(s) a question in relation to the task or The instructor agrees with a learner(s) in relation to the task.	A learner asks another learner(s) a question in relation to the task, drawing on their background. or A learner agrees/disagrees with another learner(s) in relation to the task, drawing on their background.	A relationship is formed/strengthened from asking question(s) that are in relation to the task. or A relationship is formed/strengthened from agreeing with the content that is in relation to the task.
		Content Sharing	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it.	A learner shares content (text, video, image, or link) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor shares content (text, video, image, or link) in relation to the task.	A learner shares content (text, video, image, or link) in relation to the task, drawing on their background, and shows their understanding of it.	A relationship is formed/strengthened based on the sharing of content that is in relation to the task.
		User Generated Content	A learner creates, and shares some original content in relation to the task.	A learner creates, and shares some original content in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.	The instructor creates, and shares some original content in relation to the task.	A learner creates, and shares some original content in relation to the task, drawing on their background.	A relationship is formed/strengthened based on creation and sharing of some original content that is in relation to the task.
		Social Connectedness	A connection is created/strengthened as learners actively learn together.	A connection is created/strengthened as learners communicate with each other.	A connection is created/strengthened as an instructor communicates with a learner.	A connection is created/strengthened as learners communicate, drawing on their background.	A connection is created/strengthened as learner's relationships are strengthened.

Figure 4-6: SMECLE Evaluation Framework V2.0

4.5.2 Evaluating the SMECLE Evaluation Framework V2.0

Analysis of IS3101 with SMECLE Evaluation Framework V2.0

In this phase, the two-step evaluation was executed. First the researcher evaluated the framework for its usefulness. Then, in a two hour evaluation session with two senior educators, the effective, and ineffective, cell rules, and/or cell structures, were discussed. The first data set to be analysed with SMECLE evaluation framework V2.0 is IS3101, which is a microblog enabled CLE. This consisted of 137 tweets, and presented in Figure 4-6 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 12 cells with instances, from a possible 25. From these 12, 10 were demonstrated to comply with the rules. However, the data demonstrated that there were 2 cells where the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. Examples of the three cells that were amended in the design and build section are provided next, followed by an explanation of two cells that were incompatible, and need to be amended in the next design and build section, in Phase 3.

			Is the internet a good place for patients to source information about their health conditions based on a specific condition?				
			Collaborative Learning Characteristics				
			Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Microblog	**Social Media Characteristics**	Social Interaction	X	X	X		X
		Social Collaboration	X	X			X
		Content Sharing	X				X
		User Generated Content	X		X		X
		Social Connectedness					

Table 4-32: IS3101 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

Compatible Cells

The following examples are of the cells that were amended in the design, and build section from Phase 2. As the cell *"Content Sharing, Active Learning"* was still demonstrated to be ineffective, there is no example for this.

Social Interaction, Active Learning

A *Social Interaction* occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner makes a comment in relation to the task, they are participating in a constructive and iterative process, and an instance of *"Social Interaction, Active Learning"* has occurred. The rule was set as follows.

Cell	Rule
Social Interaction, Active Learning (1,1)	A learner makes a comment in relation to the task.

Table 4-33: SMECLE Evaluation Framework V2.0 Cell Rule for Social Interaction, Active Learning

An example of this occurring is:

Social Interaction, Active Learning		
Tweet Reference: G1T2	**Learner Name:** @hiseh110313195	**Assessment**
@hiseh103466507 maybe we should look into what regulates sites like that? accuracy etc.		A learner makes a comment *(Social Interaction)* in relation to the task, and make a suggestion on what they should focus on in terms of the topic they have been assigned, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning).*

Table 4-34: Phase 2 Compatible Cell of Social Interaction, Active Learning

Social Interaction, Role of the Instructor

A *Social Interaction* occurs when a learner makes a comment. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this rule is that anytime an instructor makes a comment in relation to the task, they are fulfilling their role, and an instance of *"Social Interaction, Role of the Instructor"* has occurred. The rule is set as follows:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment in relation to the task.

Table 4-35: SMECLE Evaluation Framework V2.0 Cell Rule for Social Interaction, Role of the Instructor

An example of this occurring is:

<table>
<tr><th colspan="3">Social Interaction, Role of the Instructor</th></tr>
<tr><td>Tweet Reference:
G2T1</td><td>Learner Name:
@hiseh108498512</td><td>Assessment</td></tr>
<tr><td colspan="2">@InstCMahony Hi, must we answer the question right now or is that for next week's class?</td><td>A learner asks a question of the instructor in relation to the task</td></tr>
<tr><td colspan="3">In response to @hiseh108498512</td></tr>
<tr><td>Tweet Reference:
I1T6</td><td>Instructor Name:
@InstCMahony</td><td>Assessment</td></tr>
<tr><td colspan="2">@hiseh108498512 as long as you can explain that answer next week using examples and the group agrees</td><td>The instructor replies with a comment (Social Interaction), and guides them towards a solution by answering the question (Role of the Instructor).</td></tr>
</table>

Table 4-36: Phase 2 Compatible Cell of Social Interaction, Role of the Instructor

Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of a social media characteristic enabling a characteristic of collaborative learning. Two cells were identified as being ineffective with the IS3101 data set, which are presented in Table 4-37, with the issues explained. To amend these rules, the data that demonstrated them to be ineffective are used in the design, and build section of Phase 3.

Incompatible Cells	Identified Issue
Content Sharing, Active Learning (3,1)	The data from IS3101 indicates that this cell itself is too limiting, where it was observed that when learners share content, it doesn't always get noticed by other learners.
User Generated Content, Active Learning (4,1)	The data from IS3101 indicates that this cell itself is too limiting, where it was observed that when learners create some content, and share it, it doesn't always get noticed by other learners.

Table 4-37: Incompatible Cells of SMECLE Evaluation Framework V2.0

4.6 Phase 3: Designing, Building, and Evaluating the SMECLE Evaluation Framework V3.0

The purpose of this section is to design and build version three of the SMECLE evaluation framework, and evaluate it with a new data set to test its usefulness. The design, and build section for SMECLE evaluation framework V3.0 is informed by the learnings of the evaluation section in Phase 2, with the focus on amending the cells, and their rules, with the aid of the IS3101 data set. The process for evaluating SMECLE evaluation framework V3.0 remains the same as Phase 1, and 2, with three data sets used to evaluate it.

4.6.1 Designing, and Building the SMECLE Evaluation Framework V3.0

Designing SMECLE Evaluation Framework Version 3.0

The process for amending rules remains the same as it was in Phase 2, where the assumption of the rule is highlighted, and the reason(s) why it was demonstrated to be ineffective is explained. This process is applied for the two cells identified in Phase 2 as being ineffective, and the IS3101 data set is used to amend them. These two cells are:

- *"Content Sharing, Active Learning"*
- *"User Generated Content, Active Learning"*

A retrospective review of the other cells is also taken, based on the learning that was derived from these two amendments, and is used to update cells where clear anomalies exist.

Amendment 1: Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are actively learning, and an instance of *"Content Sharing, Active Learning"* has occurred. The rule was set as follows:

Cell	Rule
Content Sharing, Active Learning (3,1)	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it.

Table 4-38: SMECLE Evaluation Framework V2.0 Cell Rule for Content Sharing, Active Learning

In this case, the issue is not with the rule itself, but data from IS3101 indicated that the cell was too limiting. That is to say, data could still be classified as an instance of *"Content Sharing, Active Learning"* in its current state, but it was emerging that often learners were sharing information, and showing their understanding of it, but other learners were not acknowledging it. So while the *Content Sharing* was enabling *Active Learning*, in these cases it was only happening at an individual level. Consider the following tweets from IS3101:

Example 1

Content Sharing, Active Learning		
Tweet Reference: G2T8	**Learner Name:** @hiseh108498512	**Assessment**
Right, well this is what PubMed has to say about placenta previa http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001902/ … #hiseh_teamb		A learner shares a link *(Content Sharing)* is in relation to the task, and shows their understanding of it by stating what it contains, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other learner acknowledges the content that was shared, indicating that it was only beneficial at an individual level.

Table 4-39: Phase 3, Amendment 1: Content Sharing, Active Learning

Example 2

Content Sharing, Active Learning		
Tweet Reference: G1T7	**Learner Name:** @hiseh111706809	**Assessment**
India's major cities, Mumbai, Delhi and Bangalore,hotspots for international medical tourism! commercial site http://www.qualitysurgeryindia.com/tag/tonsil-removal-surgery-india/ …		A learner shares a link *(Content Sharing)* is in relation to the task, and shows their understanding of it by making a comment as to what the link leads to, indicating they have consumed, and understood the content, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other learner acknowledges that they viewed the link that was shared, indicating that the content was only beneficial at an individual level.

Table 4-40: Phase 3, Amendment 1: Content Sharing, Active Learning

Example 3

Content Sharing, Active Learning		
Tweet Reference: G1T6	**Learner Name:** *@hiseh110313195*	**Assessment**
#hiseh_teama *http://www.webmd.com/oral-health/tc/tonsillitis-topic- overview* …		A learner shares a link *(Content Sharing)* is in relation to the task, and makes a comment as to what it entails, indicating they have consumed, and understood the content, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning).*
In response to @hiseh110313195		
Tweet Reference: G1T8	**Learner Name:** @hiseh111706809	**Assessment**
@hiseh110313195 yeah, webMD would be a good source, #solidposting		This content is acknowledged by another group member, who comments on how the particular website is a good source, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, indicating that the content shared was not only beneficial at an individual level, but also a group level.

Table 4-41: Phase 3, Amendment 1: Content Sharing, Active Learning

Under the current rule, each of these interactions would be classified as instances of *"Content Sharing, Active Learning"* because in all the examples a learner is sharing content and showing their understanding of it. However, the main difference between Example 3 in comparison to Examples 1 and 2 is that the learner shared some content, providing their understanding of it, and that content gets an acknowledgment from another group member. This does not occur in Example 1 or 2, where content is shared, and the learners show their understanding of it, but no other group members acknowledge it. The understanding from this, is that *Content Sharing* can enable *Active Learning* at different levels, namely at an individual level, and a group level. Therefore, the cell needs to be restructured to accommodate for these two levels, and the rules are amended to implement this understanding. The rules are set as:

Cell	Level	Rules
Content Sharing, Active Learning (3.1.1)	Individual	A learner shares content (text, video, image, and/or article, etc.) in relation to the task, showing their understanding of it, but no other learner acknowledges it.
Content Sharing, Active Learning (3.1.2)	Group	A learner shares content (text, video, image, and/or article, etc.) in relation to the task, showing their understanding of it, and at least one other learner acknowledges it.

Table 4-42: SMECLE Evaluation Framework V3.0 Amended Rules for Content Sharing, Active Learning

Amendment 2: User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are actively learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. The rule was set as follows:

Cell	Rule
User Generated Content, Active Learning (4,1)	A learner creates, and shares, original content in relation to the task.

Table 4-43: SMECLE Evaluation Framework V2.0 Cell Rule for User Generated Content, Active Learning

In this case, the issue is not with the rule itself, but data from IS3101 indicated that the cell was too limiting. It was evident that learners were creating, and sharing content in relation to the task, but other learners were not always acknowledging it. So *User Generated Content* was enabling *Active Learning*, but it was either happening at an individual, or a group level. Consider the following tweets from IS3101:

Example 1

User Generated Content, Active Learning		
Tweet Reference: G1T32	**Learner Name:** @hiseh110300233	**Assessment**
#hiseh_teama patients would def have enough sources to be able discuss whether they want to go through with the surgery or not		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other learner acknowledges this original content, indicating that the content was only beneficial at an individual level.

Table 4-44: Phase 3, Amendment 2: User Generated Content, Active Learning

Example 2

User Generated Content, Active Learning		
Tweet Reference: G2T35	**Learner Name:** @hiseh110311731	**Assessment**
#hiseh_teamb id say its a grand way of finding info with the amount of sites we'v found		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @hiseh110311731		
Tweet Reference: G2T36	**Learner Name:** @hiseh109751564	**Assessment**
@hiseh110311731 #hiseh_teamb I agree		This original content is acknowledged by another group member, who agrees with the opinion that was offered, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, indicating that the original content shared was not only beneficial at an individual level, but also a group level.

Table 4-45: Phase 3, Amendment 2: User Generated Content, Active Learning

Under the current rule, each of these interactions would be classified as instances of *"User Generated Content, Active Learning"* because in both the examples a learner is creating some original content, and sharing it. However, the main difference between Example 1 and Example 2 is that the learner has created and shared some content, which requires *Active Learning*, but in Example 1 no other group members acknowledge the original content, but in Example 2 another group member does acknowledge the original content by agreeing with it. The understanding from this, is that *User Generated Content* can enable *Active Learning* at different levels, namely at an individual level, and a group level. Therefore, the cell needs to be restructured to accommodate for these two levels, and the rules are amended to implement this understanding. The rules are set as:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares, original content in relation to the task, but no other learner acknowledges it.
User Generated Content, Active Learning (4.1.2)	Group	A learner creates, and shares, original content in relation to the task, and at least one other learner acknowledges it.

Table 4-46: SMECLE Evaluation Framework V3.0 Amended Rules for User Generated Content, Active Learning

Retrospective Review of Cells and Rules

With these two rules amended, a retrospective review of the other cells was undertaken, reviewing their rules with respect to the new learning that was acquired. However, no clear anomalies were identified, so no further rules needed to be amended.

Building SMECLE Evaluation Framework 3.0

SMECLE Framework V3.0 is presented in Figure 4-7. There are structural changes to two of the cells, *"Content Sharing, Active Learning"*, and *"User Generated Content, Active Learning"*, and this resulted in new rules being created for them based on the data from IS3101. This framework must now be evaluated by a new data set to test its usefulness, and this is presented next.

			Task					
			Collaborative Learning Characteristics					
			Active Learning		Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Social Media Platform	**Social Media Characteristics**	Social Interaction	1.1		1.2	1.3	1.4	1.5
		Social Collaboration	2.1		2.2	2.3	2.4	2.5
		Content Sharing	3.1.1	3.1.2	3.2	3.3	3.4	3.5
		User Generated Content	4.1.1	4.1.2	4.2	4.3	4.4	4.5
		Social Connectedness	5.1		5.2	5.3	5.4	5.5

Figure 4-7: SMECLE Evaluation Framework V3.0

4.6.2 Evaluating the SMECLE Evaluation Framework V3.0

Analysis of IS4428 with SMECLE Evaluation Framework V3.0

In this phase, the two-step evaluation was executed. First the researcher evaluated the framework for its usefulness. Then, in a two hour evaluation session with two senior educators, the effective, and ineffective, cell rules, and/or cell structures, were discussed. The first data set to be analysed with SMECLE evaluation framework V3.0 is IS4428, which is a microblog enabled CLE. This consisted of 299 tweets, and presented in Figure 4-8 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 12 cells with instances, from a possible 25, which all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended. Examples of the two cells that were amended in the design and build section are provided next, followed by another evaluation of the framework with a different data set.

			The #task is to define what is meant by website #navigation, #testing, and #SEO					
			Collaborative Learning Characteristics					
			Active Learning		Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Microblog	**Social Media Characteristics**	Social Interaction			X	X		X
		Social Collaboration	X		X			X
		Content Sharing	X	X	X			X
		User Generated Content	X	X		X		X
		Social Connectedness						

Figure 4-8: IS4428 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

Compatible Cells

The following examples are of the cells that were amended in the design, and build section from Phase 3.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and shows their understanding of it, they are participating in a constructive and iterative process of interaction and negotiation, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who consumes this content, the occurrence may be at an individual level, or group level. The rules were set as follows:

Cell	Level	Rules
Content Sharing, Active Learning (3.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, but no other learner acknowledges it.
Content Sharing, Active Learning (3.1.2)	Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one other learner acknowledges it.

Table 4-47: SMECLE Evaluation Framework V3.0 Cell Rules for Content Sharing, Active Learning

An example of this occurring is:

Individual Level

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G1T20	**Learner Name:** @IS4428108115877	**Assessment**
@IS4428108115877 @IS4428108604606 #Testing, 15 Tools for Website Testing http://www.graphicrating.com/2009/08/11/15-tools-for-testing-your-website/ …		A learner shares a link *(Content Sharing)* in relation to the task, with a comment as to what to expect from the link, indicating they have consumed, and understood the content, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the content that was shared, therefore the instance has occurred at an individual level.

Table 4-48: Phase 3 Compatible Cell of Content Sharing, Active Learning: Individual Level

Group Level

<table>
<tr><th colspan="3">Content Sharing, Active Learning: Group Level</th></tr>
<tr><td>Tweet Reference:
G2T30</td><td>Learner Name:
@IS4428108453888</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108350141 @IS4428108396329 websites such as http://www.webpagetest.org/ can also be used #Testing</td><td>A learner shares a link with their group members (Content Sharing) in relation to the task, commenting on why the link is useful, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @IS4428108453888</td></tr>
<tr><td>Tweet Reference:
G2T31</td><td>Learner Name:
@IS4428108396329</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108453888 @IS4428108350141 very good. Here is a handy definition also http://support.google.com/webmasters/bin/answer.py?hl=en&answer=35291 ...</td><td>Another learner acknowledges the content that was shared, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning), and then provides a link of their own. As the learner got an acknowledgement on the content they shared from a group member, the Active Learning has occurred at a group level.</td></tr>
</table>

Table 4-49: Phase 3 Compatible Cell of Content Sharing, Active Learning: Group Level

User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are actively learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. Depending on who consumes this content, the occurrence may be at an individual level, or group level. The rules were set as follows:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares, original content in relation to the task, but no other learner acknowledges it.
User Generated Content, Active Learning (4.1.2)	Group	A learner creates, and shares, original content in relation to the task, and at least one other learner acknowledges it.

Table 4-50: SMECLE Evaluation Framework V3.0 Cell Rules for User Generated Content, Active Learning

An example of this occurring is:

Individual Level

User Generated Content, Active Learning: Individual Level		
Tweet Reference: G2T45	**Learner Name:** @IS4428108350141	**Assessment**
@IS4428108453888 @IS4428108396329 you happy with this? #SEO Process of improving the visibility of a website in search engines #G2		a learner has created some original content *(User Generated Content)* in relation to the task, by offering a definition on a topic, based on their understanding of what it is, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the original content that was shared, therefore the instance has occurred at an individual level.

Table 4-51: Phase 3 Compatible Cell of User Generated Content, Active Learning: Individual Level

Group Level

Content Sharing, Active Learning: Group Level		
Tweet Reference: G4T36	**Learner Name:** @IS4428108596956	**Assessment**
Navigation is the means by which users make their way thru a website. It must be logical, flexible and obvious to be useful #IS4421G4		a learner has created some original content *(User Generated Content)* in relation to the task, by offering a definition on a topic, based on their understanding of what it is, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108596956		
Tweet Reference: G4T40	**Learner Name:** @IS4428108595178	**Assessment**
Mike we'll go with yours! Do we DM them or what? #IS4428G4		Another learner acknowledges the original content by agreeing with it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner got an acknowledgement on the content they shared from a group member, the *Active Learning* has occurred at a group level.

Table 4-52: Phase 3 Compatible Cell of User Generated Content, Active Learning: Group Level

Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of social media characteristics enabling collaborative learning characteristics. There were no cells identified as being ineffective with the IS4428 data set. To evaluate the usefulness of the SMECLE evaluation framework V3.0 further, a second microblog enabled CLE will be analysed, with IS6119 being the data set. This analysis is presented next.

Analysis of IS6119 with SMECLE Evaluation Framework V3.0

The second data set to be analysed with SMECLE evaluation framework V3.0 is IS6119, which is a microblog enabled CLE. This was initially used to evaluate

SMECLE evaluation framework V1.0. Presented in Figure 4-9 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 12 cells with instances, from a possible 25, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended. Examples of three compatible cells are provided next, followed by another evaluation of the framework with a different data set.

<table>
<tr><td colspan="3"></td><td colspan="6">#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach</td></tr>
<tr><td colspan="3"></td><td colspan="6">Collaborative Learning Characteristics</td></tr>
<tr><td colspan="3"></td><td colspan="2">Active Learning</td><td>Group Participation</td><td>Role of the Instructor</td><td>Learner Diversity</td><td>Learner Relationships</td></tr>
<tr><td rowspan="5">Microblog</td><td rowspan="5">Social Media Characteristics</td><td>Social Interaction</td><td colspan="2"></td><td>X</td><td>X</td><td></td><td>X</td></tr>
<tr><td>Social Collaboration</td><td colspan="2">X</td><td>X</td><td></td><td></td><td>X</td></tr>
<tr><td>Content Sharing</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td>X</td></tr>
<tr><td>User Generated Content</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td>X</td></tr>
<tr><td>Social Connectedness</td><td colspan="2"></td><td></td><td></td><td></td><td></td></tr>
</table>

Figure 4-9: IS6119 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

Compatible Cells

The following examples are of three cells that were demonstrated to be compatible from the analysis.

Social Interaction, Role of the Instructor

A *Social Interaction* occurs when a learner makes a comment. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this rule is that anytime an instructor makes a comment in relation to the task, they are fulfilling their role, and an instance of *"Social Interaction, Role of the Instructor"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment in relation to the task.

Table 4-53: SMECLE Evaluation Framework V3.0 Cell Rule for Social Interaction, Role of the Instructor

An example of this occurring is:

Social Interaction, Role of the Instructor		
Tweet Reference: G3T31	**Learner Name:** @isbp103464679	**Assessment**
#group3 definitions will be emailed to u!		A learner makes a comment regarding how they will email their answers to the instructor.
In response to @isbp103464679		
Tweet Reference: I1T6	**Learner Name:** @ISBP93260857	**Assessment**
@isbp103464679 will you pop them on twitter		This is different to what was instructed of them, so the instructor makes a comment *(Social Interaction)* in relation to the task, and guides them on how they should actually send their answers *(Role of the Instructor).*

Table 4-54: Phase 3 Compatible Cell of User Generated Content, Active Learning: Group Level

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this base rule is that if learners ask questions of each other, or agree/disagree with each other, then an instance of *"Social Collaboration, Active Learning"* has occurred. The rules are set as follows:

Cell	Rule
Social Collaboration, Active Learning (2,1)	A learner asks another learner(s) a question in relation to the task. or A learner agrees/disagrees with another learner(s) in relation to the task.

Table 4-55: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Active Learning

An example of this occurring is:

Social Collaboration, Active Learning		
Tweet Reference: G6T8	**Learner Name:** @ISBP111221319	**Assessment**
@ISBP106681379 @ISBP111223726 @ISBP111223139 I think IT/IS outsourcing is great, what are yer thoughts? #Group6		A learner asks a question of their group members *(Social Collaboration)* in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP111221319		
Tweet Reference: G6T9	**Learner Name:** @ISBP111223139	**Assessment**
@ISBP111221319 @ISBP106681379 @ISBP111223726 i agree :D		They get a response from a group member, who agrees with them *(Social Collaboration)*, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-56: Phase 3 Compatible Cell of Social Collaboration, Active Learning

Social Collaboration, Group Participation

Social Collaboration occurs when learners interact to generate, edit, and share content, out of necessity. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The base assumption for this rule is twofold: if a learner asks a question of another learner and they acknowledge it, and a consensual answer is reached; or if a learner agrees/disagrees with another learner, and they acknowledge it, and a consensual answer is reached, an instance of *"Social Collaboration, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
Social Collaboration, Group Participation (2,2)	A learner asks another learner(s) a question(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached. or A learner agrees/disagrees with another learner(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.

Table 4-57: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Group Participation

An example of this occurring is:

Social Collaboration, Group Participation		
Tweet Reference: G4T23	**Learner Name:** @ISBP107480661	**Assessment**
could the strategic intent of the outsoucing be considered an approach @ISBP108573671 @ISBP111223571 and Yvonne		A learner asks a question of their group members *(Social Collaboration)* in relation to the task
In response to @ISBP107480661		
Tweet Reference: G4T24	**Learner Name:** @ISBP108573671	**Assessment**
@ISBP107480661 @ISBP111223571 ya totes on the right track there kirstie well done #winning		They get a response from a group member *(Group Participation)*, who agrees with them, helping them reach a consensus *(Group Participation)*.

Table 4-58: Phase 3 Compatible Cell of Social Collaboration, Group Participation

Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of social media characteristics enabling collaborative learning characteristics. There were no cells identified as being ineffective with the IS3101 data set. This is the second microblog enabled CLE where this has been the case, so it is now necessary to evaluate the usefulness of the SMECLE evaluation framework V3.0 with a different type of SMECLE. IS2200 will be analysed, which is a blog enabled CLE, and this analysis is presented next.

Analysis of IS2200 with SMECLE Evaluation Framework V3.0

The third data set to be analysed with SMECLE evaluation framework V3.0 is IS2200, which is a blog enabled CLE. This consisted of 809 blog posts, and 1623 blog comments, and presented in Figure 4-10 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 13 cells with instances, from a possible 25. From these 13, 7 were demonstrated to comply with the rules. However, the data demonstrated that there were 6 cells that the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. Examples of two compatible cells are provided next, followed by an explanation of the six cells that were incompatible, and need to be amended in the next design and build section, in Phase 4.

			Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.				
			Collaborative Learning Characteristics				
			Active Learning	Group Participation	Role of the Instructor	Learner Diversity	Learner Relationships
Blog	**Social Media Characteristics**	Social Interaction	X	X	X	X	X
		Social Collaboration	X	X			X
		Content Sharing	X X				X
		User Generated Content	X X		X		X
		Social Connectedness					

Figure 4-10: IS2200 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

Compatible Cells

The following examples are of instances that were demonstrated to be appropriate at analysing the data from IS2200.

Social Interaction, Role of the Instructor

A *Social Interaction* occurs when a learner makes a comment. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this rule is that anytime an instructor makes a comment in relation to the task, they are fulfilling their role, and an instance of *"Social Interaction, Role of the Instructor"* has occurred. The rule is set as follows:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment in relation to the task.

Table 4-59: SMECLE Evaluation Framework V3.0 Cell Rule for Social Interaction, Role of the Instructor

An example of this occurring is:

Social Interaction, Role of the Instructor		
Blog Reference: G9B1	**Learner Name:** instructorcathaldoyle	**Assessment**
Could you please add the category to this post. You can do this by editing the post, and choose the category at the bottom right. Thanks.		The instructor leaves a comment *(Social Interaction)* in relation to the task, offering guidance by reminding them to categorise their post *(Role of the Instructor)*. The learner responds by changing the category as requested.

Table 4-60: Phase 3 Compatible Cell of Social Interaction, Role of the Instructor

Social Interaction, Learner Diversity

A *Social Interaction* occurs when a learner makes a comment. *Learner Diversity* occurs when a learner draws on their background to provide different perspectives on task-related information. The assumption for this rule is if a learner makes a comment, and refers to their background, an instance of *"Social Interaction, Learner Diversity"* has occurred. The rule was set as follows:

Cell	Rule
Socials Interaction, Learner Diversity (1,4)	A learner makes a comment in relation to the task, drawing on their diversity.

Table 4-61: SMECLE Evaluation Framework V3.0

An example of this occurring is:

Social Interaction, Learner Diversity		
Blog Reference: G37B7	**Learner Name:** sad111511053	**Assessment**
…i completely agree with this blog! time is money…having worked in a business environment for many years (I am a mature student) …it is imperative that time dead-lines are met, always, on time..every time. In relation to the value of information as blogged by you, time management and keeping to realistic timeframes in essential. Thanks again..		A learner makes a comment *(Social Interaction)* in relation to the task, where they draw on their past experience *(Learner Diversity)* of working in a business environment to validate what another learner has spoken about in their blog post.

Table 4-62: Phase 3 Compatible Cell of Social Interaction, Learner Diversity

Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of social media characteristics enabling collaborative learning characteristics. Six cells were identified as being ineffective with the IS2200 data set, which are presented in Table 4-63, with the issues explained. To amend these rules, the data that demonstrated them to be ineffective are used in the design, and build section of Phase 4.

Incompatible Cells	Identified Issue
Social Interaction, Active Learning (1.1)	The data from IS2200 indicates that this cell itself is too limiting, where it was observed that comments can be made by different group members, such as assigned group members, and the class group.
Social Interaction, Group Participation (1.2)	The data from IS2200 indicates that this cell itself is too limiting, where it was observed that *Group Participation* can happen between different levels of groups, such as assigned groups, and the class group. It was also observed that the rule is too broad, as *Group Participation* requires a few interactions.
Social Collaboration, Active Learning (2.1)	The data from IS2200 indicates that this cell itself is too limiting, where it was observed that learners from different groups can ask questions of each other, and/or agree/disagree with each other. It was also observed that the rule was too broad, as it was too easy for learners to agree or disagree but not explain why.
Social Collaboration, Group Participation (2.2)	The data from IS2200 indicates that this cell itself is too limiting, where it was observed that *Group Participation* can happen between different levels of groups, such as assigned groups, and the class group. It was also observed that the rule is too broad, as *Group Participation* requires a few interactions.
Content Sharing, Active Learning (3.1.1, 3.1.2)	While this cell is already split, the data from IS2200 indicates that the cell is still too limiting, as it was observed that learners were sharing content, with different levels of group members acknowledging it. It was also observed that the rule was too broad as many learners were just acknowledging content that was shared, but not showing any signs that they had consumed it, or learned from it.
User Generated Content, Active Learning (4.1.1, 4.1.2)	While this cell is already split, the data from IS2200 indicates that the cell is still too limiting, as it was observed that while learners were generating content, and sharing it, different levels of group members were acknowledging it. It was also observed that the rule was too broad as many learners were just acknowledging the *User Generated Content* that was shared, but not showing any signs that they had consumed it, or learned from it.

Table 4-63: Incompatible Cells of SMECLE Framework V3.0

4.7 Phase 4: Designing, Building, and Evaluating the SMECLE Evaluation Framework V4.0

The purpose of this section is to design and build version four of the SMECLE evaluation framework, and evaluate it with a new data set to test its usefulness. The design, and build section for SMECLE evaluation framework V4.0 is informed by the learnings of the evaluation section in Phase 3, with the focus on amending the cells, and their rules, with the aid of the IS2200 data set. The process for evaluating SMECLE evaluation framework V4.0 remains the same as Phase 1, 2, and 3, with three data sets used to evaluate it.

4.7.1 Designing, and Building the SMECLE Evaluation Framework V4.0

4.7.1.1 Designing SMECLE Evaluation Framework Version 4.0

The design and build phase for SMECLE Framework V4.0 involves further structural changes to cells. These structural changes also require rules to be amended, and the process that was applied in Phase 2 and 3 is again applied here, where the IS2200 data set previously used to evaluate the framework, is now used to create the understanding as to why cells and their rules need to be amended. This process is applied for the six cells identified in Phase 3 as being ineffective, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Social Interaction, Group Participation"*
- *"Social Collaboration, Active Learning"*
- *"Social Collaboration, Group Participation"*
- *"Content Sharing, Active Learning"*
- *"User Generated Content, Active Learning"*

A retrospective review of the other cells is also taken, based on the learning that was derived from these six amendments, and is used to update cells where clear anomalies exist.

Amendment 1: Social Interaction, Active Learning

A *Social Interaction* occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner makes a comment in relation to the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Active Learning (1,1)	A learner makes a comment in relation to the task.

Table 4-64: SMECLE Evaluation Framework V3.0 Cell Rule for Social Interaction, Active Learning

This is a rule that was already amended in Phase 2, where the data from a microblog enabled CLE indicated that the rule was too broad. In this case, the data from IS2200 highlights a different issue, not with the rule itself, but the structure of the cell, where it is proving to be too broad, as the data indicates that *Active Learning* can occur at different levels. Consider the following blog posts/comments from IS2200:

Example 1

<table>
<tr><th colspan="3">Social Interaction, Active Learning</th></tr>
<tr><td>Blog Reference:
G20B9</td><td>Learner Name:
sad111414148</td><td>Assessment</td></tr>
<tr><td colspan="2">The definition of Information System failure is also important in order to direct research and facilitate data collection for more correction. Unfortunately this is not clear and there does not seem to be any consensus on this topic. Without this consensus, it will be very difficult for policy makers and regulating bodies to set legislation</td><td>A learner makes a comment (Social Interaction) in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). No other group member acknowledges the comment.</td></tr>
</table>

Table 4-65: Phase 4, Amendment 1: Social Interaction, Active Learning

Example 2

Social Interaction, Active Learning		
Blog Reference: G6B4	**Learner Name:** sad111313976	**Assessment**
I didnt really understand the planning stage before this but now I fully understand it great job i might right a blog soon about sdlc		A learner makes a comment *(Social Interaction)* in relation to the task, on a blog post by another learner, stating that they have learnt from reading the blog post, participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. This comment is coming from an assigned group member.

Table 4-66: Phase 4, Amendment 1: Social Interaction, Active Learning

Example 3

Social Interaction, Active Learning		
Blog Reference: G1B1	**Learner Name:** sad111505863	**Assessment**
Really good blog. Very informative and visual. Diagrams helped my understanding of DFDS and flow charts. :)		A learner also makes a comment *(Social Interaction)* in relation to the task, on a blog post from another learner, indicating that they have learned from reading it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. What is different in this instance however, is that the comment is made by a learner from outside the assigned group, and is coming from a class group member.

Table 4-67: Phase 4, Amendment 1: Social Interaction, Active Learning

Example 4

Social Interaction, Active Learning		
Blog Reference: G40B6	**Learner Name:** Complete IT Pro (@complete_it_pro)	**Assessment**
Thanks for the link to my site! I've read a few of your articles now and they're pretty good – I'll keep coming back! Ben		A learner makes a comment *(Social Interaction)* in relation to the task, on a blog post from another learner, indicating that they have learned from reading it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, in this instance, the comment is made from a learner from the discipline's community, who is outside both the assigned group, and class group identified above.

Table 4-68: Phase 4, Amendment 1: Social Interaction, Active Learning

Under the current rule, each of these tweets would be classified as instances of *"Social Interaction, Active Learning"* as in each one a learner is making a comment in relation to the task. What is evident from these comments however, is that *Social Interaction* can enable *Active Learning* at different levels. These levels coincide with Bruffee (1999, p.8) who suggests that in CLEs there are different layers of groups at work, presented in Table 4-69: the transition Group, which consists of small groups of learners working together to learn the language, mores, and values of a particular community; the class group, which is a larger community consisting of the different transition groups; and the discipline community group, which is a still larger community in which the learners are trying to become members of, where the class group is nested. Finally, there is also the individual themselves, which consists of each learner in the environment (Bruffee, 1999, p.8). For this research, transition group is referred to as the assigned group, as it represents the assigned groups that the instructor creates.

Level	Explanation
Individual	An individual consists of any learner in the collaborative learning environment.
Assigned Group	The assigned group consists of any learner inside the groups of 3-4 that is generated by the instructor.
Class Group	The class group consists of any learner in the class, outside of the assigned group.
Discipline Community	The discipline community consists of any learner who has knowledge of the domain but is not a member of the class.

Table 4-69: Collaborative Learning Group Levels

This is a new understanding, where it is evident from IS2200 that the different collaborative learning groups that manifest in face-to-face CLEs, also manifest in blog enabled CLEs. The four levels are: individual: assigned group; class group; and discipline community group. The structure of the cell is thus split into four smaller cells, with the rules amended to reflect this:

Cell	Level	Rules
Social Interaction, Active Learning (1.1.1)	Individual	A learner makes a comment in relation to the task, but no group member acknowledges it.
Social Interaction, Active Learning (1.1.2)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.
Social Interaction, Active Learning (1.1.3)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.
Social Interaction, Active Learning (1.1.4)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.

Table 4-70: SMECLE Evaluation Framework V4.0 Amended Rules for Social Interaction, Active Learning

Amendment 2: Social Interaction, Group Participation

A *Social Interaction* occurs when a learner makes a comment. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this base rule is that at least two learners need to be involved for *Group Participation*, where if a learner makes a comment, and at least one group member acknowledges it, and they reach a consensual answer, an instance of *"Social interaction, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Group Participation (1,2)	A learner makes a comment in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.

Table 4-71: SMECLE Evaluation Framework V3.0 Cell Rule for Social Interaction, Group Participation

In this case, the data from IS2200 highlights the structure of the cell is too broad, where the cell assumes that all *"Social Interaction, Group Participation"* instances occur at a single level. It also demonstrates that the rule is too broad, as requiring only one acknowledgement from a group member for *Group Participation* means a lot of comments are classified as instances of *"Social Interaction, Group Participation"* when really there is no *Group Participation* actually occurring. Consider the following blog posts/comments from IS2200:

Example 1

Social Interaction, Group Participation		
Blog Reference: G9B9	**Learner Name:** sad112759089	**Assessment**
Really like your use of diagrams in your blog.		A learner makes a comment *(Social Interaction)* in relation to the task, explaining how they liked the diagrams used in the blog.
In response to sad112759089		
Tweet Reference: G9B9	**Learner Name:** sad111332336	**Assessment**
Thanks :)		The learner who wrote the blog acknowledges this by making a comment *(Social Interaction)*, thanking the other learner, and a consensus is reached *(Group Participation)*.

Table 4-72: Phase 4, Amendment 2: Social Interaction, Group Participation

Example 2

<table>
<tr><th colspan="3">Social Interaction, Group Participation</th></tr>
<tr><td>Blog Reference:
G11B14</td><td>Learner Name:
sad111346901</td><td>Assessment</td></tr>
<tr><td colspan="2">I totally agree, I just did a similar blog like this its crazy how a phone is now like a mini computer!</td><td>A learner makes a comment (Social Interaction) in relation to the task, where they agree with a blog post, and give their opinion on the content.</td></tr>
<tr><td colspan="3">In response to sad111346901</td></tr>
<tr><td>Blog Reference:
G11B14</td><td>Learner Name:
sad111350151</td><td>Assessment</td></tr>
<tr><td colspan="2">It really is:) I'm glad you agree</td><td>An assigned group member acknowledges this and makes a comment (Social Interaction) agreeing with their comment (Group Participation).</td></tr>
<tr><td colspan="3">In response to sad111350151</td></tr>
<tr><td>Blog Reference:
G11B14</td><td>Learner Name:
sad111350396</td><td>Assessment</td></tr>
<tr><td colspan="2">As group members we have clearly seen how phones, laptops and tablets are changing and changing everyday to meet the growing demands of its users. We are sure to see new changes in 5/10/15 years time aswell, great blog!!</td><td>Another assigned group member then responds with a comment (Social Interaction) giving an overview of what they have looked at (Group Participation).</td></tr>
<tr><td colspan="3">In response to sad111350396</td></tr>
<tr><td>Blog Reference:
G11B14</td><td>Learner Name:
sad111346901</td><td>Assessment</td></tr>
<tr><td colspan="2">I also agree with sad111350396 as we covered a lot of topics during the course of this blogging assignment and even though we didn't feed off each others all the time it worked out better as we have more of a diverse and varied series of blogs! Good work :) specifically to this blog I find it very informative and so true, especially how you mentioned the transitions of a computer and how they are in our ands now as phones which myself and another member f our group discussed :)</td><td>Yet another assigned group member then responds with a comment (Social Interaction) agreeing with the previous comment (Group Participation), and a consensus is reached (Group Participation).</td></tr>
</table>

Table 4-73: Phase 4, Amendment 2: Social Interaction, Group Participation

Example 3

<table>
<tr><th colspan="3">Social Interaction, Group Participation</th></tr>
<tr><td>Blog Reference:
G11B19</td><td>Learner Name:
sad111448932</td><td>Assessment</td></tr>
<tr><td colspan="2">I really liked how you used the example of Deloitte!</td><td>A learner makes a comment (Social Interaction) in relation to the task, explaining how they liked the example that was used.</td></tr>
<tr><td colspan="3">In response to sad111448932</td></tr>
<tr><td>Blog Reference:
G11B19</td><td>Learner Name:
sad111350151</td><td>Assessment</td></tr>
<tr><td colspan="2">Thanks! you should check out the links because there is a lot of other interesting information on this topic there. the video is particulary good and everything is explained really well! :)</td><td>A class group member responds to this comment (Social Interaction), thanking them for their comment, and encouraging them to look at the other links they shared (Group Participation).</td></tr>
<tr><td colspan="3">In response to sad111350151</td></tr>
<tr><td>Blog Reference:
G11B19</td><td>Learner Name:
sad111448932</td><td>Assessment</td></tr>
<tr><td colspan="2">Ya sure i will check it out!</td><td>The other class group member responds again with a comment (Social Interaction), suggesting they will look at them (Group Participation), and a consensus is reached (Group Participation).</td></tr>
</table>

Table 4-74: Phase 4, Amendment 2: Social Interaction, Group Participation

Under the current rule, each of these interactions would be classified as instances of *"Social Interaction, Group Participation"* as in each one a learner is making a comment, and getting acknowledged by another learner, and a consensual answer is being reached. However, it is evident that Example 1 differs to Examples 2 and 3, where the interaction is minimal, in comparison to the other two. This was a regular occurrence throughout IS2200, where while it does meet the requirements of the current rule, there is clearly no *Group Participation* occurring. It is learned that *Group Participation* requires more than just two learners to be involved, which was the initial assumption, but there needs to be some conversation between the learners, like there is in Examples 2 and 3. The understanding from this is that for *Group Participation*, there needs to be at least three interactions between at least two group members, with a consensual answer being reached, for it to be considered *Group Participation*.

It is also evident from Examples 2 and 3 that *Social Interaction* can enable *Group Participation* at different levels, as the learners involved in the conversations do not always come from the same assigned groups. Further to this, while there was no instance of a *"Social Interaction, Group Participation"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could make a similar comment as in the third example above, and get the same *Group Participation* occurring. The structure of this cell is thus split into three smaller cells: assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Interaction, Group Participation (1.2.1)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.
Social Interaction, Group Participation (1.2.2)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.
Social Interaction, Group Participation (1.2.3)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 4-75: SMECLE Evaluation Framework V4.0 Amended Cell Rules for Social Interaction, Group Participation

Amendment 3: Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this base rule is that if learners ask questions of each other, or agree/disagree with each other, then an instance of *"Social Collaboration, Active Learning"* has occurred. The rule was set as follows:

Cell	Rule
Social Collaboration, Active Learning (2,1)	A learner asks another learner(s) a question in relation to the task. or A learner agrees/disagrees with another learner(s) in relation to the task.

Table 4-76: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Active Learning

In this case, the data from IS2200 highlights the structure of the cell is too broad, where the cell assumes that all *"Social Interaction, Active Learning"* instances occur at a single level. The data also indicates that the rules are too broad in terms of learners agreeing/disagreeing with each other, but not explaining why. Consider the following blog posts/comments from IS2200:

Example 1

Social Collaboration, Active Learning		
Blog Reference: G40B5	**Learner Name:** sad111562473	**Assessment**
Really informative blog I was wonfering if you had any real-life examples of how the relevancy of information can be beneifical to the success of an information system?		A learner asks a question of another learner *(Social Collaboration)*, in relation to the task, after reading their Blog post, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other group member acknowledges the question.

Table 4-77: Phase 4, Amendment 3: Social Collaboration, Active Learning

Example 2

Social Collaboration, Active Learning		
Blog Reference: G44B2	**Learner Name:** sad111744291	**Assessment**
Is not system analyst's role to design the way how he will gather the most accurate information?		A learner asks a question of another learner *(Social Collaboration)*, in relation to the task, after reading their blog post, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111744291		
Blog Reference: G44B2	**Learner Name:** sad112567137	**Assessment**
Yes, that's true :) The analyst designs the way in which info will be gathered, once then know what their client requires :)		The learner responds by agreeing with the comment *(Social Collaboration)*, and answers the question, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. Both these learners are from the same assigned group.

Table 4-78: Phase 4, Amendment 3: Social Collaboration, Active Learning

Example 3

Social Collaboration, Active Learning		
Blog Reference: G10B7	**Learner Name:** sad111346076	**Assessment**
Very informative blog! In your opinion what is the the biggest problem with information systems?		A learner asks a question of another learner *(Social Collaboration)* in relation to the task, after reading their blog post *(Active Learning)*.
In response to sad111346076		
Blog Reference: G10B7	**Learner Name:** sad111343201	**Assessment**
Thank you :) Well I think the biggest problems are not knowing how to use the information system, not training the employees how to use it correctly and not getting an information system that fits the needs of the organisation. What do you think is the biggest problem?		The learner who wrote the blog post responds with an answer *(Active Learning)*. They then ask a further question of the learner who asked the original question *(Social Collaboration)*.
In response to sad111343201		
Blog Reference: G10B7	**Learner Name:** sad111346076	**Assessment**
I would have to agree, without proper training for people using it,a multi-million euro information system is useless. Likewise, there is no point having a complex and expensive information system that doesn't meet the needs of the organisation.		This learner agrees with the comment that was made *(Social Collaboration)*, and explains why *(Active Learning)*. The original question was asked by a learner from outside the assigned group, and is coming from a class group member.

Table 4-79: Phase 4, Amendment 3: Social Collaboration, Active Learning

Under the current rule, each of these interactions would be classified as instances of *"Social Collaboration, Active Learning"* as in each one a learner is asking a question, or agreeing with another learner. However, in Example 2 it is evident that when the learner agrees with the other learner, they provide a reason why. This is a new understanding, where when learners agree/disagree with others, they need to provide a reason why, as opposed to just saying *"Nice blog, I think you are right"* which was a common occurrence in this data set.

It is also evident from the examples that *Social Collaboration* can enable *Active Learning* at different levels, as the learners involved in the conversations do not always come from the same assigned groups, and they do not always get an acknowledgment to their questions, or agreements/disagreements. Further to this, while there was no instance of a *"Social Collaboration, Active Learning"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could ask questions of other learners, or agree/disagree with them, explaining why. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Collaboration, Active Learning (2.1.1)	Individual	A learner asks a group member(s) a question(s) in relation to the task, but no group member acknowledges it. or A learner agrees/disagrees with a group member(s) in relation to the task, and explains why, but no group member acknowledges it.
Social Collaboration, Active Learning (2.1.2)	Assigned Group	A learner asks an assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it. or A learner agrees/disagrees with an assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it.
Social Collaboration, Active Learning (2.1.3)	Class Group	A learner asks a class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it. or A learner agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it.
Social Collaboration, Active Learning (2.1.4)	Discipline Community Group	A learner asks a discipline community group member(s) a question(s) in relation to the task, and at least one discipline community group member acknowledges it. or A learner agrees/disagrees with a discipline community group member(s) in relation to the task, and explains why, and at least one discipline community group member acknowledges it.

Table 4-80: SMECLE Evaluation Framework V4.0 Amended Cell Rules for Social Collaboration, Active Learning

Amendment 4: Social Collaboration, Group Participation

Social Collaboration occurs when learners interact to generate, edit, and share content, out of necessity. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is twofold: if a learner asks a question of another learner and they acknowledge it, and reach a consensual answer; or if a learner agrees/disagrees with another learner, and they acknowledge it, and they reach a consensual answer, an instance of *"Social Collaboration, Group Participation"* has occurred. The rule was set as follows:

Cell	**Rule**
Social Collaboration, Group Participation (2,2)	A learner asks another learner(s) a question(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached. or A learner agrees/disagrees with another learner(s) in relation to the task, and at least one group member acknowledges it, and a consensual answer is reached.

Table 4-81: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Group Participation

In this case, the issue with the rule was proven to be twofold by the IS2200 data. Firstly, the data indicates that the cell itself is too broad, and it is observed that the cell can be split further to reveal what level *Social Collaboration* is enabling *Group Participation* at. Secondly, from the previous learning about *Group Participation*, the rules are also broad. Consider the following blog posts/comments from IS2200:

Example 1

Social Collaboration, Group Participation		
Blog Reference: G44B12	**Learner Name:** sad112540853	**Assessment**
Great blog :D Very well written. Do you think that it would be extremely important to have good people skills to be a good system analyst? or should it even matter when they are good at designing systems ? :D		A learner asks an assigned group member a question *(Social Collaboration)* in relation to the task, about the topic that was discussed in a blog post.
In response to sad112540853		
Blog Reference: G44B12	**Learner Name:** sad111744291	**Assessment**
I think you should have good people skills to be good system analyst as to design good system you need good information, to gather them you need to talk to people. This is my opinion and it could be different to others… :D		The assigned group member responds by answering the question *(Group Participation).*
In response to sad111744291		
Blog Reference: G44B12	**Learner Name:** sad112540853	**Assessment**
I totally agree :D If don't have good people skills, you will find it extremely difficult to find out the requirements of the business or for the customers. It is awful talking to a person who just does not have good people skills and just don't care how they make you feel :D Thanks :D		This is followed by a response from the learner of the original question, where they agree with the response *(Social Collaboration)* and explain why, and a consensus is reached *(Group Participation).*

Table 4-82: Phase 4, Amendment 4: Social Collaboration, Group Participation

Example 2

Social Collaboration, Group Participation		
Blog Reference: G16B1	**Learner Name:** sad112759089	**Assessment**
Nicely structured blog, which decision category is used mostly??		A learner asks a class group member a question *(Social Collaboration)* in relation to the task, about the topic that was discussed in the blog post.
In response to sad112759089		
Blog Reference: G16B1	**Learner Name:** sad111383486	**Assessment**
From what I've studied of IS for Decision Making, it seems as though structured decisions are the most common. They occur on a frequent basis but, since they require no human interaction, they can be easily solved and there is no disruption to the running of the firm.		The class group member responds by answering the question *(Group Participation).*
In response to sad111383486		
Blog Reference: G16B1	**Learner Name:** sad112759089	**Assessment**
Thanks, I found that interesting!:)		This is followed by a response from the learner of the original question, thanking them for the response *(Group Participation)*, and a consensus is reached *(Group Participation).*

Table 4-83: Phase 4, Amendment 4: Social Collaboration, Group Participation

Under the current rule, each of these interactions would be classified as instances of *"Social Collaboration, Group Participation"* as in each one a learner is asking a question, and getting acknowledged by another learner, and a consensual answer is being reached. Similar to the previous learning, we also observe conversations occurring, where learners are not only asking questions, and getting replies, but they are responding to these replies also. Therefore the rule needs to be amended to ensure that for *Group Participation* to occur there needs to be at least three interactions between at least two group members, with a consensual answer being reached, for it to be considered *Group Participation*. Further to this, the understanding that learners who agree/disagree with other learners, must explain why is also inherited. So for

Social Collaboration to enable *Active Learning*, learners must ask questions of each other, or agree/disagree with other learners, and explain why.

It is also evident from these examples that *Social Collaboration* can enable *Group Participation* at different levels, as the learners involved in the conversations do not always come from the same assigned groups. Further to this, while there was no instance of a *"Social Collaboration, Group Participation"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could can ask questions, or agree/disagree with other learners in relation to the task, and get responses. The structure of this cell is thus split into three smaller cells: assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Collaboration, Group Participation (2.2.1)	Assigned Group	An assigned group member asks another assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by at least one assigned group member, and a consensual answer is reached. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it, which is further acknowledged by a least one assigned group member, and a consensual answer is reached.
Social Collaboration, Group Participation (2.2.2)	Class Group	A class group member asks another class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by at least one class group member, and a consensual answer is reached. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by a least one class group member, and a consensual answer is reached.
Social Collaboration, Group Participation (2.2.3)	Discipline Community Group	A discipline community member asks a class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by a least one class or discipline community group member, and a consensual answer is reached. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by at least one class or discipline community group member, and a consensual answer is reached.

Table 4-84: SMECLE Evaluation Framework V4.0 Amended Cell Rules for Social Collaboration, Group Participation

Amendment 5: Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are actively learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who consumes this content, the occurrence may be at an individual level, or group level. The rules were set as follows:

Cell	Level	Rules
Content Sharing, Active Learning (3.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (3.1.2)	Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one group member acknowledges it.

Table 4-85: SMECLE Evaluation Framework V3.0 Cell Rules for Content Sharing, Active Learning

This is a cell that was previously split in Phase 3 due to the data from microblog enabled CLE indicating that instances of it can occur at two separate levels. In this case, the data from IS2200 indicates that the structure of the cell can be split further, to reveal what level *Content Sharing* is enabling *Active Learning* at. Consider the following blog posts/comments from IS2200:

Example 1

Content Sharing, Active Learning		
Blog Reference: G5B9	**Learner Name:** sad111303111	**Assessment**
Here is a video that I found which I think is very interesting and offers a more basic look at DSDM. http://www.youtube.com/watch?v=Jdv90Vbp-wo		a learner shares a link to a YouTube clip *(Content Sharing)* in relation to the task, and comments on why it is useful, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other learner acknowledges the content that was shared, indicating that it was only beneficial at an individual level.

Table 4-86: Phase 4, Amendment 5: Content Sharing, Active Learning

Example 2

Content Sharing, Active Learning		
Blog Reference: G22B1	**Learner Name:** sad111420992	**Assessment**
This is a diagram that will help describe the different levels within an organisation: *Image Shared*		A learner shares an image *(Content Sharing)* in relation to the task, and makes a comment about it, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111420992		
Blog Reference: G22B1	**Learner Name:** sad111417732	**Assessment**
Good use of diagram to describe the different levels.		This content is acknowledged by an assigned group member, who comments about how it helps describe the topic they are discussing, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, and indicating that the content shared was beneficial at an assigned group level.

Table 4-87: Phase 4, Amendment 5: Content Sharing, Active Learning

Example 3

Content Sharing, Active Learning		
Blog Reference: G32B16	**Learner Name:** sad111463042	**Assessment**
Today im going to tell you how to make a dataflow diagram. But as I said before I am not great at explain things to people without being physically being able to be face to face with you. So this video should explain to you how to develop a dataflow diagram. *Video Clip Shared*		A learner embeds a video clip to their blog post *(Content Sharing)* in relation to the task, and makes a comment about it, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111463042		
Blog Reference: G32B16	**Learner Name:** sad111562473	**Assessment**
Liked the video link really cleared up what we were doing in class and tutorials during the last few weeks		This content is acknowledged by a class group member, who comments about how it helped clear up the topic for them, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, and indicating that the content shared was beneficial at a class group level.

Table 4-88: Phase 4, Amendment 5: Content Sharing, Active Learning

Under the current rules, each of these interactions would be classified as instances of either individual or class group *"Content Sharing, Active Learning"* because in both examples a learner is sharing content and showing their understanding of it, but in one they do not get a response, and in the other they do. However, it was observed from the data that many learners were acknowledging shared content with simple comments such as *"Nice image"*, or *"Good video"*, which under the current rules would be considered as *Active Learning* occurring at a group level due to content that has been shared. This leads to an understanding that, learners who acknowledge content that has been shared need to provide an understanding of it also, to indicate *Active Learning* has occurred as a result of them consuming it.

It is also evident from the three examples above that *Content Sharing* can enable *Active Learning* at more than the current two levels, as learners can share content and not have it acknowledged, or it can be acknowledge by both assigned group members, and class group members. Further to this, while there was no instance of a *"Content Sharing, Active Learning"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could share content, and show their understanding of it, or acknowledge content that other learners have shared. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Content Sharing, Active Learning (4.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (4.1.2)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.3)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.4)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, and shows their understanding of it.

Table 4-89: SMECLE Evaluation Framework V4.0 Amended Rules for Content Sharing, Active Learning

Amendment 6: User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are actively learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. Depending on who consumes this content, the occurrence may be at an individual level, or group level. The rules were set as follows:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Active Learning (4.1.2)	Group	A learner creates, and shares some original content in relation to the task, and at least one group member acknowledges it.

Table 4-90: SMECLE Evaluation Framework V3.0 Cell Rules for User Generated Content, Active Learning

This is a cell that was previously split in Phase 3 due to the data from microblog enabled CLE indicating that instances of it can occur at two separate levels. In this case, the data from IS2200 indicates that the structure of the cell can be split further, to reveal what level *User Generated Content* is enabling *Active Learning* at. Consider the following blog posts/comments from IS2200:

Example 1

User Generated Content, Active Learning		
Blog Reference: G12B23	**Learner Name:** sad111351131	**Assessment**
I think it is vital that this role is done well. In my opinion the key to this particular role and how to carry it out successfully is for the systems analyst to ensure that they have as much knowledge about the hardware and software tools they are using and being up to date with modern day ways of doing things.		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. However, no other learner acknowledges this original content, indicating that the content was only beneficial at an individual level.

Table 4-91: Phase 4, Amendment 6: User Generated Content, Active Learning

Example 2

User Generated Content, Active Learning		
Blog Reference: G11B3	**Learner Name:** sad111346901	**Assessment**
Therefore in my opinion, I would believe that in the next 5-10 years the trends in information systems will be fluctuating at a faster rate due to the huge and prominent influence of information technologies and also the internet.		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111346901		
Blog Reference: G11B3	**Learner Name:** sad111350151	**Assessment**
Yeah I definitely agree that the internet has allowed IS to expand at a much quicker rate. Interesting post:)		This original content is acknowledged by an assigned group member, who agrees with the opinion that was offered, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, indicating that the original content shared was not only beneficial at an individual level, but also an assigned group level.

Table 4-92: Phase 4, Amendment 6: User Generated Content, Active Learning

Example 3

User Generated Content, Active Learning		
Blog Reference: G38B5	**Learner Name:** sad111526987	**Assessment**
In my opinion, the reason for this is employees lack the intelligence to deal with the complexities of systems development. It is clear organizations fails to learn from their experience in systems development because of limits of intelligence organizational designs and educational barriers.		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111526987		
Blog Reference: G38B5	**Learner Name:** sad111708665	**Assessment**
…i like the opinions you have expressed here. yes, you are right, so many organisation just accept failure. thanks for your blog :)		This original content is acknowledged by a class group member, who agrees with the opinion that was offered, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*, indicating that the original content shared was not only beneficial at an individual level, but also a class group level.

Table 4-93: Phase 4, Amendment 6: User Generated Content, Active Learning

Under the current rules, each of these interactions would be classified as instances of either individual or group *"User Generated Content, Active Learning"* because in each example a learner is creating and sharing some original content, but in Example 1 they do not get a response, and in Example 2 and 3 they do. However, from the new understanding that learners who respond to content need to show their understanding of it for *Active Learning* to occur, also applies here for when learners respond to original content, they too need to show their understanding of it, to indicate *Active Learning* has occurred.

It is also evident from the three examples above that *User Generated Content* can enable *Active Learning* at more than the current two levels, as learners can create and share original content and not have it acknowledged, or it can be acknowledged by both assigned group members, and class group members. Further to this, while there was no instance of a *"User Generated Content,, Active Learning"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could create and share original content, or acknowledge original content other learners have shared. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Active Learning (4.1.2)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.3)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.4)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table 4-94: SMECLE Evaluation Framework V4.0 Amended Rules for User Generated Content, Active Learning

Retrospective Review of Cells and Rules

With these three rules amended, a retrospective review of the other cells was undertaken, reviewing their rules with respect to the new learning that was acquired. From the new understanding of what constitutes *Social Collaboration*, where it is necessary for a learner to explain why they agree/disagree with another learner, the rest of the cells containing *Social Collaboration* need to be amended: *"Social Collaboration, Role of the Instructor"*, and *"Social Collaboration, Learner Diversity"* are amended. Also, from the new understanding of what constitutes *Group Participation*, where there needs to be at least three interactions, a review of the cells that contain *Group Participation* was done, and it was deemed two further cell's rules were required to be amended to incorporate this understanding: *"Content*

Sharing, Group Participation", and *"User Generated Content, Group Participation"*.

Amendment 7: Social Collaboration, Role of the Instructor

Social Collaboration occurs when learners interact to generate, edit, and share content, out of necessity. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this base rule is that if the instructor asks questions of, or agrees/disagrees, with group members, then they are fulfilling their role and an instance of *"Social Collaboration, Role of the Instructor"* has occurred. The rule was set as follows:

Cell	Rule
Social Collaboration, Role of the Instructor (2,3)	The instructor asks a learner(s) a question in relation to the task or The instructor agrees/disagrees with a learner(s) in relation to the task.

Table 4-95: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Role of the Instructor

From the learning of the other instances of *Social Collaboration*, it is now known that when a learner agrees/disagrees with another learner, they must explain why. This also applies for the instructor, who when agreeing or disagreeing with learners, needs to explain why. Therefore the rule for this cell is amended to:

Cell	Rule
Social Collaboration, Role of the Instructor (2,3)	The instructor asks a learner(s) a question in relation to the task or The instructor agrees/disagrees with a learner(s) in relation to the task, explaining why.

Table 4-96: SMECLE Evaluation Framework V4.0 Amended Rule for Social Collaboration, Role of the Instructor

Amendment 8: Social Collaboration, Learner Diversity

Social Collaboration occurs when learners interact to generate, edit, and share content, out of necessity. *Learner Diversity* occurs when a learner can draw on their background to provide different perspectives on task-related information. The assumption for this rule is that anytime a learner asks a question of another learner, drawing on their diversity, or when they agree/disagree with another learner, drawing on their diversity, an instance of *"Social Collaboration, Learner Diversity"* has occurred. The rule was set as follows:

Cell	Rule
Social Collaboration, Learner Diversity (2,4)	A learner asks another learner(s) a question in relation to the task, drawing on their diversity. or A learner agrees/disagrees with another learner(s) in relation to the task, drawing on their diversity.

Table 4-97: SMECLE Evaluation Framework V3.0 Cell Rule for Social Collaboration, Learner Diversity

From the learning of the other instances of *Social Collaboration*, it is now known that when a learner agrees/disagrees with another learner, they must explain why. When a learner is drawing on their diversity to agree/disagree with another learner, they need to explain why also. Therefore the rule for this cell is amended to:

Cell	Rule
Social Collaboration, Learner Diversity (2,4)	A learner asks another learner(s) a question in relation to the task, drawing on their diversity. or A learner agrees/disagrees with another learner(s) in relation to the task, explaining why by, drawing on their diversity.

Table 4-98: SMECLE Evaluation Framework V4.0 Amended Rule for Social Collaboration, Learner Diversity

Amendment 9: Content Sharing, Group Participation

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that if a learner shares some content, and shows an understanding of it, and another group member acknowledges, and a consensual answer is reached, then an instance of *"Content Sharing, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
Content Sharing, Group Participation (3.2)	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one group member acknowledges it.

Table 4-99: SMECLE Evaluation Framework V3.0 Cell Rule for Content Sharing, Group Participation

From the learning of the other instances of *Group Participation*, it is now known that in order for *Group Participation* to occur, there needs to be a conversation between learners. That is to say, a learner sharing content and their understanding of it, and another learner acknowledging it, does not constitute an instance of *Content Sharing* enabling *Group Participation*. There needs to be at least one more acknowledgement for this to be the case. Therefore the rule for this cell is amended to:

Cell	Rule
Content Sharing, Group Participation (3.2)	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one group member acknowledges it, which is further acknowledged by a least one other group member, and a consensual answer is reached.

Table 4-100: SMECLE Evaluation Framework V4.0 Amended Cell Rule for Content Sharing, Group Participation

Amendment 10: User Generated Content, Group Participation

User Generated Content is original content created by the learner, or building on previously existing content. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that if a learner creates some original content, shares it, and another group member acknowledges it, and a consensual answer is reached, then an instance of *"User Generated Content, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
User Generated Content, Group Participation (4.2)	A learner creates, and shares some original content in relation to the task, and at least one group member acknowledges it.

Table 4-101: SMECLE Evaluation Framework V3.0 Cell Rule for User Generated Content, Group Participation

From the learning of the other instances of *Group Participation*, it is now known that in order for *Group Participation* to occur, there needs to be a conversation between learners. That is to say, a learner creating, and sharing content, and another learner acknowledging it, does not constitute an instance of *User Generated Content* enabling *Group Participation*. There needs to be at least one more acknowledgement for this to be the case. Therefore the rule for this cell is amended to:

Cell	Rule
User Generated Content, Group Participation (4.2)	A learner creates, and shares some original content in relation to the task, and at least one group member acknowledges it, which is further acknowledged by a least one other group member, and a consensual answer is reached.

Table 4-102: SMECLE Evaluation Framework V4.0 Amended Rule for User Generated Content, Group Participation

4.7.1.2 Building SMECLE Evaluation Framework 4.0

SMECLE evaluation framework V4.0 is presented in Figure 4-11. There are structural changes to six of the cells, *"Social Interaction, Active Learning"*, *"Social Interaction, Group Participation"*, *"Social Collaboration, Active Learning"*, *"Social Collaboration, Group Participation"*, *"Content Sharing, Active Learning"*, and *"User Generated Content, Active Learning"*, and this resulted in new rules being created for them. No further cells or rules were amended, so the framework must not be evaluated by a new data set to test it, and this is presented next.

			Task									
			Collaborative Learning Characteristics									
			Active Learning				Group Participation			Role of the Instructor	Learner Diversity	Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG			
Social Media Platform	**Social Media Characteristics**	Social Interaction	1.1.1	1.1.2	1.1.3	1.1.4	1.2.1	1.2.2	1.2.3	1.3	1.4	1.5
		Social Collaboration	2.1.1	2.1.2	2.1.3	2.1.4	2.2.1	2.2.2	2.2.3	2.3	2.4	2.5
		Content Sharing	3.1.1	3.1.2	3.1.3	3.1.4	3.2			3.3	3.4	3.5
		User Generated Content	4.1.1	4.1.2	4.1.3	4.1.4	4.2			4.3	4.4	4.5
		Social Connectedness	5.1				5.2			5.3	5.4	5.5

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-11: SMECLE Evaluation Framework V4.0

4.7.2 Evaluating the SMECLE Evaluation Framework V4.0

Analysis of IS6119 with SMECLE Evaluation Framework V4.0

The first data set to be analysed with SMECLE evaluation framework V4.0 is IS6119, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V1.0, and V3.0. In total there were 12 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended.

Analysis of IS3101 with SMECLE Evaluation Framework V4.0

The second data set to be analysed with SMECLE evaluation framework V4.0 is IS3101, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V2.0. In total there were 12 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended.

Analysis of IS4428 with SMECLE Evaluation Framework V4.0

The first data set to be analysed with SMECLE evaluation framework V4.0 is IS4428, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V1.0, and V3.0. In total there were 12 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended.

Analysis of IS6118 with SMECLE Evaluation Framework V4.0

In this phase, the two-step evaluation was executed. First the researcher evaluated the framework for its usefulness. Then, in a two hour evaluation session with two senior educators, the effective, and ineffective, cell rules, and/or cell structures, were discussed. The next data set to be analysed with SMECLE evaluation framework V4.0 is IS6118, which is a blog enabled CLE. This consisted of 323 blog posts, and 721 blog comments, and presented in Figure 4-12 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 14 cells with instances, from a possible 25. From these 14, 10 were demonstrated to comply with the rules, with these instances occurring at different levels. However, the data demonstrated that there were 4 cells that the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. Examples of the six cells that were amended in the design and build section are provided next, followed by an explanation of two cells that were incompatible, and need to be amended in the next design and build section, in Phase 4.

Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.

Collaborative Learning Characteristics

			Active Learning				Group Participation			Role of the Instructor	Learner Diversity	Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG			
Blog	**Social Media Characteristics**	Social Interaction	X	X	X	X	X	X			X	X
		Social Collaboration	X	X	X		X	X				X
		Content Sharing	X	X	X			X				X
		User Generated Content	X	X	X			X			X	X
		Social Connectedness										

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-12: IS6118 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

4.7.2.1 Compatible Cells

All six of the amended cells, and their rules, from the design and build section of this phase were demonstrated to be appropriate. While there was four other cells amended in the retrospective review, there was no instance of the *"Social Collaboration, Role of the Instructor"* cell, or *"Social Collaboration, Learner Diversity"* cell, and the other two were demonstrated to be ineffective. Therefore an example of each of the initial amended cells is presented next.

Social Interaction, Active Learning

A *Social Interaction* occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner makes a comment in relation to the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level. The rules were set as follows:

Cell	Level	Rules
Social Interaction, Active Learning (1.1.1)	Individual	A learner makes a comment in relation to the task, but no group member acknowledges it.
Social Interaction, Active Learning (1.1.2)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.
Social Interaction, Active Learning (1.1.3)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.
Social Interaction, Active Learning (1.1.4)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.

Table 4-103: SMECLE Evaluation Framework V4.0 Cell Rules for Social Interaction, Active Learning

Examples of each of these occurring are:

Individual Level

Social Interaction, Active Learning: Individual Level		
Blog Reference: G3B9	**Learner Name:** blackbird333	**Assessment**
I enjoyed your blog, especially the You Tube video. I also liked your use of statistics. They help to picture how many companies are currently involved. I wonder how long it will take before most companies are involved with the Social Business process.		A learner makes a comment *(Social Interaction)* in relation to the task, and explains how some of the information in the blog post helped them, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the comment that was made, therefore the instance has occurred at the individual level.

Table 4-104: Phase 4 Compatible Cell of Social Interaction, Active Learning: Individual Level

Assigned Group Level

Social Interaction, Active Learning: Assigned Group Level		
Blog Reference: G4B10	**Learner Name:** 04ac	**Assessment**
Blogger d112221671 http://sopinion8ed.wordpress.com/2012/10/27/good-technology-bad-business-model/ gives an example of this when they speak about the Betamax v's VHS video standards war. Although Betamax was seen as more technology advanced company, it was VHS who came out on top because they could achieve strategic alignment within their company, thus giving them the competitive advantage over their rivals. The Strategic Blogger has also given a good example in the case study of Toyota and the process of reengineering it took to get strategic alignment.		A learner makes a comment *(Social Interaction)* in relation to the task, by discussing two companies who were competing with each other, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to 04ac		
Blog Reference: G4B10	**Learner Name:** pm1083	**Assessment**
Really like the VHS vs Betamax example. Interesting how the better technology failed due to poor strategy.		An assigned group member then acknowledges this by making a comment *(Social Interaction)* on this example, giving their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the comment was an assigned group member, this instance occurred at an assigned group level.

Table 4-105: Phase 4 Compatible Cell of Social Interaction, Active Learning: Assigned Group Level

Class Group Level

Social Interaction, Active Learning: Class Group Level		
Blog Reference: G10B3	**Learner Name:** le1008	**Assessment**
I really enjoyed reading your blog also. Taking a different approach to explaining the meaning of social business to us was a good idea. I thought that the video clip of Cadburys Marketing Study was a interesting way to get across the true value of social media for a business. The benefits it can have to a company can be clearly seen in this example.		A learner makes a comment *(Social Interaction)* in relation to the task, discussing some of the ideas that were in a blog post, participating in a constructive and iterative process of interaction and negotiation *(Active Learning).*
In response to le1008		
Blog Reference: G10B3	**Learner Name:** eddyjquinn	**Assessment**
I'm glad you enjoyed the blog, thanks for your comment		This is acknowledged by a class group member with a comment *(Social Interaction)*, who thanks them. As the learner who acknowledged it was not an assigned group member, but a class group member, this instance occurred at a class group level.

Table 4-106: Phase 4 Compatible Cell of Social Interaction, Active Learning: Class Group Level

Discipline Community Group Level

Social Interaction, Active Learning: Discipline Community Group Level		
Blog Reference: G9B14	**Learner Name:** cmcoughlan	**Assessment**
I've been looking over my past blogs today and other blogs within the BPM and Re-engineering category and decided to recap on the definitions of both concepts having now carried out much more research on the topic. While doing so I came across a brief but very concise video clip (approx 7 minutes) which covers the relationship between BPM and Re-engineering, two practices which have a lot in common but 'start in different places and differ in their execution.' (Steve Wiseman, Principal Consultant at Holly Group)		A learner makes a comment *(Social Interaction)* in relation to the task, explaining how they are going to write a recap of two concepts they have covered before, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning).*
In response to cmcoughlan		
Blog Reference: G9B14	**Learner Name:** rachel	**Assessment**
Very interesting blog. I have never heard of either of these concepts before. This has been informative. Thank you.		A discipline community member then makes a comment *(Social Interaction)* acknowledging the comment that was made, and indicating they have learnt from it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning*). As the learner who acknowledged it was not an assigned or class group member, but a discipline community group member, this instance occurred at a discipline community group level.

Table 4-107: Phase 4 Compatible Cell of Social Interaction, Active Learning: Discipline Community Group Level

Social Interaction, Group Participation

A *Social Interaction* occurs when a learner makes a comment. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner makes a comment, and at least one group member acknowledges it, which is further acknowledged by another group member, and a consensual answer is reached, an instance of *"Social Interaction, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group Level, class group level, or discipline community group level. The rules were set as follows:

Cell	Level	Rules
Social Interaction, Group Participation (1.2.1)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member.
Social Interaction, Group Participation (1.2.2)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member.
Social Interaction, Group Participation (1.2.3)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member.

Table 4-108: SMECLE Evaluation Framework V4.0 Cell Rule for Social Interaction, Group Participation

An example of each of these occurring are:

Assigned Group

Social Interaction, Group Participation: Assigned Group Level		
Blog Reference: G4B1	**Learner Name:** 04ac	**Assessment**
Business-IS Strategic Alignment is the alignment of business and information systems strategies which enhance an organisation's performance (Chan et al 2006).The idea is to link strategies of a business with technology to improve the overall running of an organisation.		A learner makes a comment *(Social Interaction)* in relation to the task, and explains the topic they are discussing.
In response to 04ac		
Blog Reference: G4B1	**Learner Name:** d112221671	**Assessment**
Hi O4ac, I thought this was a really good introductory post to the topic! Good definition of strategic alignment! You might want to check out my blog, you can find it at http://sopinion8ed.wordpress.com/author/d112221671/. Thanks!		An assigned group member then makes a comment *(Social Interaction)* acknowledging the previous comment, agreeing with the blog post *(Group Participation)*.
In response to d112221671		
Blog Reference: G4B1	**Learner Name:** 04ac	**Assessment**
Hi d112221671, thanks for your positive feedback, I liked your comparison of Bergerson's view of Strategic Alignment as a 'fit' within a jigsaw and how it has to fit properly to work, just like strategic alignment in a business!		The original learner responds with a comment *(Social Interaction)* thanking them for their feedback, and a consensus is reached *(Group Participation)*. As the learners involved in these interactions are from an assigned group, this instance occurred at an assigned group level.

Table 4-109: Phase 4 Compatible Cell of Social Interaction, Group Participation: Assigned Group Level

Class Group

Social Interaction, Group Participation: Class Group Level		
Blog Reference: G6B4	**Learner Name:** steepletoes	**Assessment**
This is something I first didn't realise. In my original understanding I thought big data was really only relevant to 'big' organisations.		A learner makes a comment *(Social Interaction)* in relation to the task, explaining how they thought big data was only for big companies.
In response to steepletoes		
Blog Reference: G6B4	**Learner Name:** cmcoughlan	**Assessment**
Good blog steepletoes! To be honest I thought 'bit data' was only relevant for big companies also, didn't understand the term well. That diagram is really good, very comprehensive!		A class group member then comments on this *(Social Interaction)*, acknowledging the point by indicating that they also thought it was only for big companies *(Group Participation)*.
In response to cmcoughlan		
Blog Reference: G6B4	**Learner Name:** steepletoes	**Assessment**
Thanks cmcoughlan! I'm glad it helped ur perception of the term. I felt that others would have had the same view seen as it was how I initially understood the term. After sifting throw mountains of text about 'big data' I thought this diagram would make understanding how this data is generated far easier to comprehend. Thanks again for your comment.		The original learner then responds with a comment *(Social Interaction)* thanking them and further justifies their point, and a consensus is reached *(Group Participation)*. As the learner who acknowledged it was not an assigned group member, but a class group member, this instance occurred at a class group level.

Table 4-110: Phase 4 Compatible Cell of Social Interaction, Group Participation: Class Group Level

Discipline Community Group

There was no instance of this in IS6118.

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if learners ask questions of other learners, or agree/disagree with other learners, in relation to the task, and explain why, an instance of *"Social Collaboration, Active Learning"* has occurred. Depending on who asks the questions, or agrees/disagrees, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rules were set as follows:

Cell	Level	Rules
Social Collaboration, Active Learning (2.1.1)	Individual	A learner asks a group member(s) a question(s) in relation to the task, but no group member acknowledges it. or A learner agrees/disagrees with a group member(s) in relation to the task, and explains why, but no group member acknowledges it.
Social Collaboration, Active Learning (2.1.2)	Assigned Group	A learner asks an assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it. or A learner agrees/disagrees with an assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it.
Social Collaboration, Active Learning (2.1.3)	Class Group	A learner asks a class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it. or A learner agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it.
Social Collaboration, Active Learning (2.1.4)	Discipline Community Group	A learner asks a discipline community group member(s) a question(s) in relation to the task, and at least one discipline community group member acknowledges it. or A learner agrees/disagrees with a discipline community group member(s) in relation to the task, and explains why, and at least one discipline community group member acknowledges it.

Table 4-111: SMECLE Evaluation Framework V4.0 Cell Rules for Social Collaboration, Active Learning

An example of each of these occurring is:

Individual

Social Collaboration, Active Learning: Individual Level		
Blog Reference: G7B10	**Learner Name:** 04ac	**Assessment**
Interesting blog post 'ah88rockybay'. I recently posted a blog on a similar topic on strategic alignment and competitive advantage http://sopinion8ed.wordpress.com/2012/11/03/how-strategic-alignment-can-help-a-business-gain-competitive-advantage/ I noted you made the point of how "as time went on firms began to realise that information systems were "critical to the implementation of a corporation's strategy", a point which I also found while doing research on the topic!		A learner agrees with a point of view that a blogger puts forward *(Social Collaboration)*, explaining why *(Active Learning)*. No other learner acknowledges the comment that was made, therefore the instance has occurred at the individual level.

Table 4-112: Phase 4 Compatible Cell of Social Collaboration, Active Learning: Individual Level

Assigned Group

Social Collaboration, Active Learning: Assigned Group Level		
Blog Reference: G11B17	**Learner Name:** cob12	**Assessment**
A good post, cdat2, I really liked the banking sector example, but do you think that alignment may pose a challenge in industries other than the banking sector? Particularly since IT seemed to fal low on the list of gauged advantages.		An assigned group member asks another assigned group member a question *(Social Collaboration)* in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-113: Phase 4 Compatible Cell of Social Collaboration, Active Learning: Assigned Group Level

Class Group

Social Collaboration, Active Learning: Class Group Level		
Blog Reference: G10B20	**Learner Name:** roisg	**Assessment**
However If we were to look at it like any other product, for example alcohol – If there is an alcohol related death from a fall or a fight do we contact Budweiser/Heineken/Smirnoff for a comment of what provisions they will put in the place to ensure an incident like it does not occur again?! Not to my knowledge anyway.. I suppose my point is does slapping the word 'social' in front of the word business automatically mean the company has to abide by different rules?		A class group member asks another class group member a question *(Social Collaboration)* in relation to the task, based on a point they make, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.

Table 4-114: Phase 4 Compatible Cell of Social Collaboration, Active Learning: Class Group Level

Discipline Community Group

Social Collaboration, Active Learning: Discipline Community Group Level		
Blog Reference: G9B16	**Learner Name:** Nancy Beckman	**Assessment**
"an organisations success in this economy is dependent on its ability to be more efficient than its competition. " I think that's a very fair argument to make. Every inch counts in today's economy. How can you save a little bit here without sacrificing your customers in the long run? It's both a short-term and long-term game. Efficiency is important but what are you willing to give up to be more efficient?		A discipline community member agrees with another learner *(Social Collaboration)* in relation to the task, and explains why, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. The learner in this case is a discipline community member so this instance occurred at a discipline community group level.

Table 4-115: Phase 4 Compatible Cell of Social Collaboration, Active Learning: Discipline Community Group Level

Social Collaboration, Group Participation

Social Collaboration occurs when learners interact to generate, edit, and share content, out of necessity. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner asks a question, or agrees/disagrees with another group member, explaining why, and at least one group member acknowledges it, which is further acknowledged by at least one group member, and a consensual answer is reached, an instance of *"Social Collaboration, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
Social Collaboration, Group Participation (2.2.1)	Assigned Group	An assigned group member asks another assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by at least one assigned group member, and a consensual answer is reached. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it, which is further acknowledged by a least one assigned group member, and a consensual answer is reached.
Social Collaboration, Group Participation (2.2.2)	Class Group	A class group member asks another class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by at least one class group member, and a consensual answer is reached. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by a least one class group member, and a consensual answer is reached.
Social Collaboration, Group Participation (2.2.3)	Discipline Community Group	A discipline community member asks a class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by a least one class or discipline community group member, and a consensual answer is reached. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by at least one class or discipline community group member, and a consensual answer is reached.

Table 4-116: SMECLE Evaluation Framework V4.0 Cell Rules for Social Collaboration, Group Participation

An example of each of these occurring is:

Assigned Group

Social Collaboration, Group Participation: Assigned Group Level		
Blog Reference: G4B23	**Learner Name:** 04ac	**Assessment**
You make some good points in this blog 'd112221671' which is why I did reference it in my last blog on the benefits of Strategic Alignment, it is good to be aware of the pros and cons concerning aligning so that you can make sure it will succeed. I would have to agree with blogger 'cob12' in that I am more on the pro-aligning side as well.		An assigned group member agrees with another assigned group member, and explains why *(Social Collaboration)* in relation to the task.
In response to 04ac		
Blog Reference: G4B23	**Learner Name:** d112221671	**Assessment**
Thanks 04ac! Its interesting that so far we are all more on the pro side for strategic alignment, I wonder if there will be many who are on the more against side of strategic alignment.		The assigned group member who wrote the blog responds *(Group Participation)* acknowledging the previous learners agreement with them, and asks a question *(Social Collaboration)*.
In response to d112221671		
Blog Reference: G4B23	**Learner Name:** 04ac	**Assessment**
I think more people are on the pro-aligning side because although you do mention the drawbacks in this blog, during most of my research on the topic of Strategic Alignment, there is a majority of literature which supports the idea of aligning strategies stating that it is very beneficial for a company in the long run and can help sustain competitive advantage.		This is again acknowledged by the other assigned group member, and a consensus is reached *(Group Participation)*. As the two learners are in the same assigned group, this instance occurred at an assigned group level.

Table 4-117: Phase 4 Compatible Cell of Social Collaboration, Group Participation: Assigned Group Level

Class Group

<table>
<tr><td colspan="3"></td></tr>
<tr><td>Blog Reference:
G3B6</td><td>Learner Name:
billynomates2012</td><td>Assessment</td></tr>
<tr><td colspan="2">I found your post very interesting. The key to implementing social business is to get everyone including employees to get involved in the concept of social business. How do organisations intend on involving employees? What are organisations doing at present to get everyone on board with social business?</td><td>A class group member agrees with another class group member, explaining why, and asks two questions (Social Collaboration), in relation to the task.</td></tr>
<tr><td colspan="3">In response to billynomates2012</td></tr>
<tr><td>Blog Reference:
G3B6</td><td>Learner Name:
blackbird333</td><td>Assessment</td></tr>
<tr><td colspan="2">Good question. It is very important for the employees to become involved with Social Business. Therefore, I believe that their employees need to be properly educated on the process. They need to be aware that it creates value for the business as a whole. I read an interesting article by Kiron,D. Et al which was titled “Social Business: What Are Companies Really Doing?|Connecting Leadership and Culture.” What they believe that companies should do to encourage employee engagement is to be a more open business. A leader must be open to new ideas and encourage employees to communicate more and to share information they find. Team-building exercises, attitude surveys and company events encourage a greater relationship amongst employees. A professor, Marshall Van Alstyne, believes that an effective method that is used in order to encourage a cultural movement toward Social Business is to ensure that employees have incentives to share instead of hoarding their information. Change is a long term process. It will take some employees a longer amount of time than others to become engaged.</td><td>This is acknowledged by the other class group member, who responds by answering the questions (Group Participation).</td></tr>
</table>

<table>
<tr><td colspan="2">Overall companies encourage openness and trust in order to encourage employees to become involved with the Social Business process.</td><td></td></tr>
<tr><td colspan="3">In response to blackbird333</td></tr>
<tr><td>Blog Reference:
G3B6</td><td>Learner Name:
eddyjquinn</td><td>Assessment</td></tr>
<tr><td colspan="2">Good blog, very comprehensive and the use of real statistics were quite informative. However, I would just like to expand on some points disagreeing with some of content in your blog. Blackbird333 and billynomates2012, having highlighted the low employee interaction rates with social business within firms, with levels ranging for 10-20% interaction, one could argue that perhaps not all employee need in be so heavily interacted with social business. If fundamental issues such as generating value or making their own job easier, the ideology and resistance to change mindset and culture is very hard to change depending on the particular firm. I feel that there is no one size fits all solution to promote greater employee interaction with new social business techniques, but this may not be a bad thing, for example if the 10-20% were educated and trained to be “experts in their area of social business” for the firm, perhaps the this may be more productive in the long run. What do ye think?</td><td>A third class group member disagrees with some of the content in the blog post, explains why, and asks a question (Social Collaboration) which is an acknowledgement of the previous comments (Group Participation).</td></tr>
<tr><td colspan="3">In response to eddyjquinn</td></tr>
<tr><td>Blog Reference:
G3B6</td><td>Learner Name:
blackbird333</td><td>Assessment</td></tr>
<tr><td colspan="2">Good question eddyjquinn. You make some good points. However, I do believe that if a business wants to move forward, it should make sure that all employees are involved in the process of change towards a Social Business. I understand the point that you are making about focusing on the 10-20% of employees,</td><td>This is in return acknowledged by the second class group member, who answers the question, and a consensus is reached (Group Participation). The learners in this case are class group members so this instance occurred at a class group level.</td></tr>
</table>

but I feel that this would not work with such a low percentage of employees being involved. There is a great commercial advantage with becoming involved in Social Business. Therefore I believe that all employees should become involved even though it will take a while for this to happen.	

Table 4-118: Phase 4 Compatible Cell of Social Collaboration, Group Participation: Class Group Level

Discipline Group

There was no instance of this in IS6118.

Social Collaboration, Role of the Instructor

There was no instance of this in IS6118.

Social Collaboration, Learner Diversity

There was no instance of this in IS6118.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are Actively Learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as follows:

Cell	Level	Rules
Content Sharing, Active Learning (4.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (4.1.2)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.3)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.4)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, and shows their understanding of it.

Table 4-119: SMECLE Evaluation Framework V4.0 Cell Rules for Content Sharing, Active Learning

An example of each of these occurring are:

Individual

Content Sharing, Active Learning: Individual Level		
Blog Reference: G3B8	**Learner Name:** zonic89	**Assessment**
The You Tube video titled "IBM Social Business Leadership Video," provides some interesting points on the importance of Social Business. (https://www.youtube.com/watch?feature=endscreen&v=jdmj69Csp1w&NR=1) It was noted that Social Businesses outperform the competition by 57%. Opportunity within a business is derived from using the combination of social, media and cloud. The video also noted that investment in Social Business is expected to increase $600 million and will be $6.4 billion in the year 2016. It was discovered that 9 out of 10 organisations believe and see that there are great benefits from Social Business. 8 of the top 10 banks and traders use IBM Social Business software. This video portrays the importance of Social Business within companies and will continue to grow in the future. I believe that Social Business is important for an organisation. Social Business is not just a method of getting closer to customers. It is also a method of influencing activities within an organisation and create a more effective company overall.		A learner shares a link to a YouTube clip *(Content Sharing)* in relation to the task, and explains the different points mentioned in the video, before explaining the importance of it, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the content that was shared, therefore the instance has occurred at an individual level.

Table 4-120: Phase 4 Compatible Cell of Content Sharing, Active Learning: Individual Level

Assigned Group

Content Sharing, Active Learning: Assigned Group Level		
Blog Reference: G3B13	**Learner Name:** zonic89	**Assessment**
As many of the previous bloggers such as le1008 (http://sopinion8ed.wordpress.com/2012/11/14/risky-social-business/) and billynomates2012 (http://sopinion8ed.wordpress.com/2012/11/11/the-risks-and-challenges-of-social-networking-on-the-business/) have provided the risks of Social Business, I believe that there is a need to study ways to avoid these risks within a Social Business. Today an organisation entering Social Business is immediately revealing itself to a variety of risks in terms of status and brand management, of responsibilities towards clients, users and partners, (Manzoni,A.:2012). Therefore, I believe that it is important for businesses to avoid these risks. Within the study Guarding the Social Gates: The Imperative for Social Media Risk Management, written by Alan Webber with Charlene Li and Jaimy Szymanski, they identify four steps to social risk management. These four steps are: 1. Identify the risks 2. Assess the risks 3. Manage and mitigate the risks Monitor and evaluate, (Altimeter group: 2012).		A learner shares some text from a study *(Content Sharing)* in relation to the task, to back up a point they make, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to zonic89		
Blog Reference: G3B13	**Learner Name:** le1008	**Assessment**
Good blog. It was interesting to see that there are steps to follow. They would be very helpful and effective for a company trying to avoid the risks that were mentioned in earlier blogs. Because of the great benefits associated with social		An assigned group member acknowledges this content by commenting on it, showing they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and

business, it is important that companies follow these steps in order to reap the rewards social business can offer them.	negotiation *(Active Learning)*. As the learner got an acknowledgement on the content they shared from an assigned group member, the *Active Learning* has occurred at an assigned group level.

Table 4-121: Phase 4 Compatible Cell of Content Sharing, Active Learning: Assigned Group Level

Class Group

Content Sharing, Active Learning: Class Group Level		
Blog Reference: G10B5	**Learner Name:** billynomates2012	**Assessment**
This is where Social Business can be very useful in maintaining customer loyalty through promotions, customer interaction etc. which will have a huge impact on the future of organisations and play a massive part in their existence. An interesting video by Esteban Kolsky, analyst with thinkJar after his presentation at the CRM Evolution 2012 conference in New York City https://www.youtube.com/watch?feature=player_embedded&v=DkOG9eemrgI#! Speaks about how organisations are adopting which is having an impact on their future outlook		A learner shares a link to a YouTube clip *(Content Sharing)* in relation to the task, and explains why it is beneficial, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to billynomates2012		
Blog Reference: G10B5	**Learner Name:** blackbird333	**Assessment**
I found your blog interesting. I enjoyed watching the video. It discovered that 40% of companies were not engaging with the CRM process. This was mainly due to lack of understanding. There are many companies not properly trained and educated on the process. Some companies also feel that they will not get value from engaging. I feel that it is necessary for businesses to be educated in this process. If you look at my recent blog titled "How are organisations adopting the concept of Social Business?" I discuss recent surveys on employee adoption of the Social Business.		A class group member acknowledges the content by commenting on it, showing they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner got an acknowledgement on the content they shared from a class group member, the *Active Learning* has occurred at a class group level.

Table 4-122: Phase 4 Compatible Cell of Content Sharing, Active Learning: Class Group Level

Discipline Community Group

There was no instance of this in IS6118.

User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are actively learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have actively learned from it. The rules were set as follows:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Active Learning (4.1.2)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.3)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges, it showing their understanding of it.
User Generated Content, Active Learning (4.1.4)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table 4-123: SMECLE Evaluation Framework V4.0 Cell Rules for User Generated Content, Active Learning

An example of each of these occurring is:

Individual

User Generated Content, Active Learning: Individual Level		
Blog Reference: G12B14	**Learner Name:** mirra2	**Assessment**
I believe the value of IS investment should be measured both during the implementation process and post implementation period.		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the original content that was shared, therefore the instance has occurred at an individual level.

Table 4-124: Phase 4 Compatible Cell of User Generated Content, Active Learning: Individual Group Level

Assigned Group

User Generated Content, Active Learning: Assigned Group Level		
Blog Reference: G1B21	**Learner Name:** ericlynch1	**Assessment**
First off I totally agree that the relationship between the CIO and CEO is very important but you mentioned how the CEO's are shrewd business men. *I also feel that the CIO needs to have as much as a business mind as well so he/she knows that the revisions or improvements being made to the technology provide business value to the organisation.*		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to ericlynch1		
Blog Reference: G1B21	**Learner Name:** aherntim1	**Assessment**
I agree with you Eric. It is very important for the CIO to have a busness mind with regards I.T. moving foward.		An assigned group member acknowledges the original content by agreeing with it, and explains why, showing their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner got an acknowledgement on the content they shared from an assigned group member, the instance has occurred at an assigned group level.

Table 4-125: Phase 4 Compatible Cell of User Generated Content, Active Learning: Assigned Group Level

Class Group

User Generated Content, Active Learning: Assigned Group Level		
Blog Reference: G9B17	**Learner Name:** roisg	**Assessment**
The literature I have quoted is from the late 90's, I believe that the focus of BPR is no longer on downsizing but that a legacy of fear exists amongst employees when confronted with the proposition of BPR & it is managements role to ensure that this fear does not lead to the failure of the project by communicating clearly the true purpose of BPR.		A learner has creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning).*
In response to roisg		
Blog Reference: G9B17	**Learner Name:** aplusk22	**Assessment**
Very interesting analogy. I agree with you that BPR has been associated with and focused on downsizing in the past. In many respects, it was used incorrectly as excuse for managers to justify downsizing actions. I think organisations have grown to understand that BPR is an operational strategy that, if implemented properly, will provide a new dimension to competing.		A class group member acknowledges the original content by agreeing with it, and explains why, showing their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning).* As the learner got an acknowledgement on the content they shared from a class group member, the instance has occurred at a class group level.

Table 4-126: Phase 4 Compatible Cell of User Generated Content, Active Learning: Class Group Level

Discipline Community

There was no instance of this in IS6118.

4.7.2.2 Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of social media characteristics enabling the characteristics of collaborative learning. Four cells were identified as being ineffective with the IS6118 data set, which are presented in Table 4-127, with the issues explained. To amend these rules, the data that demonstrated them to be ineffective are used in the design, and build section of Phase 4.

Incompatible Cells	Identified Issue
Social Interaction, Learner Diversity (1,4)	The data from IS6118 indicates that this cell itself is too limiting, where it was observed that *Learner Diversity* can happen between different levels of groups, such as individuals, assigned groups, class groups, and discipline community group.
Content Sharing, Group Participation (3,2)	The data from IS6118 indicates that this cell itself is too limiting, where it was observed that *Group Participation* can happen between different levels of groups, such as assigned groups, and the class group.
User Generated Content, Group Participation (4,2)	The data from IS6118 indicates that this cell itself is too limiting, where it was observed that *Group Participation* can happen between different levels of groups, such as assigned groups, and the class group.
User Generated Content, Learner Diversity (4,4)	The data from IS6118 indicates that this cell itself is too limiting, where it was observed that *Learner Diversity* can happen between different levels of groups, such as individuals, assigned groups, class groups, and discipline community group.

Table 4-127: Incompatible Cells of SMECLE Framework V4.0

4.1 Phase 5: Designing, Building, and Evaluating the SMECLE Evaluation Framework V5.0

The purpose of this section is to design and build version five of the SMECLE evaluation framework, and evaluate it with a new data set to test its usefulness. The design and build section for SMECLE evaluation framework V5.0 is informed by the learnings of the evaluation section in Phase 4, with the focus on amending the cells, and their rules, with the aid of the IS6118 data set. The process for evaluating SMECLE evaluation framework V3.0 remains the same as Phase 1, 2, 3, and 4, with three data sets used to evaluate it.

4.1.1 Designing, and Building the SMECLE Evaluation Framework V5.0

4.1.1.1 Designing SMECLE Evaluation Framework Version 5.0

The design and build phase for SMECLE Framework V5.0 involves further structural changes to two cells. These structural changes also require rules to be amended, and the process that was applied in Phase 2, 3, and 4 is again applied here, where the IS6118 data set previously used to evaluate the framework, is now used to create the understanding as to why cells and their rules need to be amended. This process is applied for four cells identified in Phase 4 as being ineffective, and these cells are:

- *"Social Interaction, Learner Diversity"*
- *"Content Sharing, Group Participation"*
- *"User Generated Content, Group Participation"*
- *"User Generated Content, Learner Diversity"*

A retrospective review of the other cells is also taken, based on the learning that was derived from these two amendments, and is used to update cells where clear anomalies exist.

Amendment 1: Social Interaction, Learner Diversity

A *Social Interaction* occurs when a learner makes a comment. *Learner Diversity* occurs when a learner draws on their background to provide different perspectives on task-related information. The assumption for this rule is that when a learner refers to their background when making a comment in relation to the task, an instance of *"Social Interaction, Learner Diversity"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Learner Diversity (1,4)	A learner makes a comment in relation to the task, drawing on their background.

Table 4-128: SMECLE Evaluation Framework V4.0 Cell Rule for Social Interaction, Learner Diversity

In this case, the data from IS6118 highlights that the structure of the cell is too broad, where the cell assumes that all *"Social Interaction, Learner Diversity"* instances occur at a single level. Consider the following blog posts/comments from IS6118:

Example 1

Social Interaction, Learner Diversity		
Blog Reference: G3B16	**Learner Name:** irishtechylad	**Assessment**
I found this article quite interesting because I could relate to whats been said in it relation to a company intranet being dull and boring which is sometihng i experienced in a previous job. If this is the case in a company, they should use a social solution allowing them to take the social features and infuse them into the daily work experience. If a company uses email such as Microsoft Outlook and collaboration tools they should also make them social. So I concur with the final statement – 'Viva la Evolution'		A learner leaves a comment on their own blog post (*Social Interaction*) where they discuss a topic in relation to the task, and refer to their background when doing so (*Learner Diversity*), but no other learner acknowledges it.

Table 4-129: Phase 5, Amendment 1: Social Interaction, Learner Diversity

Example 2

<table>
<tr><th colspan="3">Social Interaction, Learner Diversity</th></tr>
<tr><td>Blog Reference:
G6B11</td><td>Learner Name:
billynomates2012</td><td>Assessment</td></tr>
<tr><td colspan="2">How do companies nulify the security risks associated with the internet. I know from my working experience that if i wanted to get work emails to my phone i had to have a password set up to access my phone. I found this quite troublesome as you want instant access without having to enter a password everytime i wnated to access my phone. Is there other security methods out there mobile technology is adopting?</td><td>A learner makes a comment in relation to the task (Social Interaction), where they draw on their background to provide an example (Learner Diversity)</td></tr>
<tr><td colspan="3">In response to billynomates2012</td></tr>
<tr><td>Blog Reference:
G6B11</td><td>Learner Name:
timh88</td><td>Assessment</td></tr>
<tr><td colspan="2">Hi billynomates2012. I think that password protection is one of the more straightforward forms of mobile device security. Passwords are used for almost all online activity from banking and shopping to checking our emails. One form of mobile security that is gaining popularity is the use of two factor authentication. This is the use of a swipe card or fob with a users password. However it still requires the need for a password. The below link provides further information on this ides. http://searchsecurity.techtarget.com/definition/two-factor-authentication</td><td>A class group member acknowledges this comment, and refers to the example they were gave, when helping to answer the question that was asked.</td></tr>
</table>

Table 4-130: Phase 5, Amendment 1: Social Interaction, Learner Diversity

Under the current rule, each of these interactions would be considered as instances of *"Social Interaction, Learner Diversity"* as in each one a learner is making a comment in relation to the task, and drawing on their background when doing so. However, it is evident from these examples that *Social Interaction* can enable *Learner Diversity* at different levels, as the learner in the first example does not get any acknowledgement, and thus it was only beneficial to them, while the second example gets an acknowledgement from a class group member, showing it was beneficial at that level. Further to this, while there was no instance of a *"Social Interaction, Learner Diversity"* occurring at the assigned group, or discipline community group level in the IS6118 data, it is plausible that a class group or discipline community group member could acknowledge a comment that a learner makes when they draw on their background. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect this learning, and the rule for the assigned group, and discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Interaction, Learner Diversity (1.4.1)	Individual	A learner makes a comment in relation to the task, drawing on their background, but no group member acknowledges it.
Social Interaction, Learner Diversity (1.4.2)	Assigned Group	A learner makes a comment in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.
Social Interaction, Learner Diversity (1.4.3)	Class Group	A learner makes a comment in relation to the task, drawing on their background, and at least one class group member acknowledges it.
Social Interaction, Learner Diversity (1.4.4)	Discipline Community Group	A learner makes a comment in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.

Table 4-131: SMECLE Evaluation Framework V5.0 Amended Rule for Social Interaction, Learner Diversity

Amendment 2: Content Sharing, Group Participation

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner shares some content, and at least one group member acknowledges it, which is further acknowledged by another group member, and a consensual answer is reached, an instance of *"Content Sharing, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
Content Sharing, Group Participation (3.2)	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one group member acknowledges it, which is further acknowledged by a least one other group member, and a consensual answer is reached.

Table 4-132: SMECLE Evaluation Framework V4.0 Cell Rule for Content Sharing, Group Participation

The rule for this cell was amended in Phase 4 in the retrospective review, based on the understanding of what constitutes *Group Participation* changing. In this case, the data from IS6118 indicates that the structure of the cell can be split further, to reveal what level *Content Sharing* is enabling *Group Participation* at. Consider the following blog posts/comments from IS6118:

Example 1

Content Sharing, Group Participation		
Blog Reference: G10B15	**Learner Name:** billynomates2012	**Assessment**
Hi Ed, *Just sense were on the topic of legality on twitter. There was a case recently of a guy burning a popey and making some crude remark. He has since been arrested http://www.dailymail.co.uk/news/article-2231660/Free-speech-row-man-ARRESTED-posting-image-burning-Poppy-Facebook-page-Remembrance-Sunday.html. What im worried about is if a company sets up an office in a foreign*		A learner shares a link to an article *(Content Sharing)* in relation to the task, to an article to back their point up.

country and then the head office decides to send out a tweet etc. which may be morally right in one country but may cause massive offence in another. As we all know different countries have different laws and regulations which has also become a big stumbling block with outsourcing.		
In response to billynomates2012		
Blog Reference: G10B15	**Learner Name:** eddyjquinn	**Assessment**
Hi billynomates2012, *Thanks for your comment, yes I can see your point in relation to foreign headquarters and tweets, it just shows how careful people have to be when using social business tools. The article you put up about the poppie burning was quite interesting too,thanks.* *Regards,* *Ed*		The assigned group member who wrote the blog post responds, and makes a comment in relation to the content that was shared *(Group Participation).*
In response to eddyjquinn		
Blog Reference: G10B15	**Learner Name:** billynomates2012	**Assessment**
Here is another case of how social media can have a negative effect on business. http://www.dailymail.co.uk/news/article-2234688/British-Airways-apologises-retweeting-racial-abuse-customer-angered-flight-cancellation.html. This is what might happen if an employee is given the responsibility of using social media under the organisiations name		This is followed by the first learner sharing another link *(Content Sharing),* who comments on it *(Group Participation).*
In response to eddyjquinn and billynomates2012		
Blog Reference: G10B15	**Learner Name:** irokoo	**Assessment**
Eddie, the legal realms of social business and its untamed consequences are surely a new and interesting horizon so curious to contemplate. The national laws on blasphemy, for example, apply only within their legal jurisdictions too limited to stretch outside the national boundaries. How do you bring legal		This is followed by a third assigned group member making a comment on the previous comments, and a consensus is reached *(Group Participation).*

actions against individuals outside your legal jurisdiction. I think the global nature of IT and its social implications may have to be dealt with outside the current limited snail speed legal administrations. Crimes are locking on the web, cases abound on untraceable internet transactions such as found in internet auctions. Unfortunately the suspect may be standing diametrically below you, 12756.2 kilometres, on the other side of the earth. Escape for your life, a new version of 'Salomon Principle' is born, 'the internet personality'. >> IROKOO		
In response to irokoo		
Blog Reference: G10B15	**Learner Name:** eddyjquinn	**Assessment**
Thank you irokoo, I think your comment is exactly the point I was trying to discuss. Perhaps national legislation is required, super-national legislation is also required however as you have clearly highlighted this is very difficult to implement in a legal reality		The assigned group member who wrote the blog responds to this comment *(Group Participation)*, and a consensus is reached.

Table 4-133: Phase 5, Amendment 1: Content Sharing, Group Participation

Example 2

Content Sharing, Group Participation		
Blog Reference: G3B1	**Learner Name:** zonic89	**Assessment**
Within IBM they believe that Social Business is one that becomes engaged, transparent and nimble. Social Business engages with its customers, employees, stakeholders and suppliers in different ways. It is transparent in the way that it opens up and provides access to subject matter experts. It is nimble in the way it reacts quickly when the right people collaborate together and get the job done. This video is interesting as leading UK bloggers David Terrar, David Cushman, Chris Turner and Johnnie Moore collaborate with IBM specialists Jon Mell, Jon Machtynger and Alex Bray to provide their different perspectives on the model of Social Business.http://www.youtube.com/watch?v=MlULxvaPsF4&feature=related		A learner shares a link to a YouTube clip *(Content Sharing)* in relation to the task, to back up a point they are making.
In response to zonic89		
Blog Reference: G3B1	**Learner Name:** eddyjquinn	**Assessment**
Good blog, I found the YouTube link very informative and interesting, this has actually raised more questions for me regarding social business, in particular the concept that social business is not such a new phenomenal….watch out for my blog, I may raise a few points of interest to you.		A class group member makes a comment about the video, discussing the video clip that was shared *(Group Participation)*.
In response to eddyjquinn		
Blog Reference: G3B1	**Learner Name:** blackbird333	**Assessment**
Thank you eddyjquinn. I am looking forward to reading your blog.		The learner who wrote the blog post then responds, thanking them for their comment, and a consensus is reached.

Table 4-134: Phase 5, Amendment 1: Content Sharing, Group Participation

Under the current rule, each of these interactions would be classified as instances of *"Content Sharing, Group Participation"* as in each one a learner is sharing content, giving their understanding of it, getting an acknowledgement from another learner, and then that response getting an acknowledgement from another learner again, and a consensus being reached. However, it is evident from these examples that *Content Sharing* can enable *Group Participation* at different levels, as the learners involved in the conversations do not always come from the same assigned groups. Further to this, while there was no instance of a *"Content Sharing, Group Participation"* occurring at the discipline community group level in the IS6118 data, it is plausible that a discipline community group member could share content, and get responses, or acknowledge content. The structure of this cell is thus split into three smaller cells: assigned group, class group, and discipline community group. There is no Individual instance as *Group Participation* requires at least two learners to be involved. The rules are amended to reflect this learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Content Sharing, Group Participation (3.2.1)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensus is reached.
Content Sharing, Group Participation (3.2.2)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensus is reached.
Content Sharing, Group Participation (3.2.3)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensus is reached.

Table 4-135: SMECLE Evaluation Framework V5.0 Amended Rule for Content Sharing, Group Participation

Amendment 3: User Generated Content, Group Participation

User Generated Content is original content created by the learner, or building on previously existing content. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner creates and shares some original content, at least one group member acknowledges it, which is further acknowledged by another group member, and a consensus is reached, an instance of *"User Generated Content, Group Participation"* has occurred. The rule was set as follows:

Cell	Rule
User Generated Content, Group Participation (4.2)	A learner creates, and shares some original content in relation to the task, and at least one group member acknowledges it, which is further acknowledged by a least one other group member, and a consensus is reached.

Table 4-136: SMECLE Evaluation Framework V4.0 Cell Rule for User Generated Content, Group Participation

The rule for this cell was amended in Phase 4 in the retrospective review, based on the understanding of what constitutes *Group Participation* changing. In this case, the data from IS6118 indicates that the structure of the cell can be split further, to reveal what level *User Generated Content* is enabling *Group Participation* at. Consider the following blog posts/comments from IS6118:

Example 1

User Generated Content, Group Participation		
Blog Reference: G1B21	**Learner Name:** aherntim1	**Assessment**
The best and worst person a CIO must report to is a CEO. I believe that if the CEO has a genuine interest in technology then the CIO will move the company forward immensely. However if the CEO does not show interest in technology it is likely the CIO will have to report to other members of the board on decision making. I believe that if a CIO is left to tend to his own work and not have to worry about someone looking over their shoulder and knows that he/she has the backing of the CEO to do so then the company the CIO works for will strive.		A learner creates some original content *(User Generated Content)* by giving their opinion, in relation to the task.
In response to aherntim1		
Blog Reference: G1B21	**Learner Name:** ericlynch1	**Assessment**
First off I totally agree that the relationship between the CIO and CEO is very important but you mentioned how the CEO's are shrewd business men. I also feel that the CIO needs to have as much as a business mind as well so he/she knows that the revisions or improvements being made to the technology provide business value to the organisation.		Another learner acknowledges this content, and agrees with it, before making another point *(Group Participation).*
In response to ericlynch1		
Blog Reference: G1B21	**Learner Name:** aherntim1	**Assessment**
I agree with you Eric. It is very important for the CIO to have a busness mind with regards I.T. moving foward.		The original learner responds to this comment, and agrees with it, and a consensus is reached *(Group Participation).*

Table 4-137: Phase 5, Amendment 2: User Generated Content, Group Participation

Example 2

User Generated Content, Group Participation		
Blog Reference: G9B4	**Learner Name:** cmcoughlan	**Assessment**
I believe BPM and BPR are management tools which help to bring about improvements in the business and I believe these techniques will be used by business for many years to come.		A learner creates some original content *(User Generated Content)* by giving their opinion, in relation to the task.
In response to cmcoughlan		
Blog Reference: G9B4	**Learner Name:** 04ac	**Assessment**
I agree with your views on BPM and BPR. By using a business approach such as BPM and a strategy like BPR, it can help a business in achieving such goals as lower costs etc. to improve the overall running of a company. Research has shown that that these two concepts have proven positive results in the past so therefore I would on the same opinion as you in believing that these two concepts are not something of the past.		Another learner acknowledges this by agreeing with what they said *(Group Participation).*
In response to 04ac		
Blog Reference: G9B4	**Learner Name:** cmcoughlan	**Assessment**
Thanks for the replies guys!		The initial learner then responds and thanks them for their reply, and a consensus is reached *(Group Participation).*

Table 4-138: Phase 5, Amendment 2: User Generated Content, Group Participation

Under the current rule, each of these interactions would be classified as instances of *"User Generated Content, Group Participation"* as in each one a learner is providing original content, getting a response from another learner, and then that response getting a response from another learner again, and a consensus being reached. Similar to the previous learning, we also observe conversations occurring, where learners are not only generating original content, and getting replies, but they are responding to these replies also. Therefore the rule needs to be amended to ensure that for *Group Participation* to occur there needs to be at least three interactions between at least two group members, with a consensual answer being reached, for it to be considered *Group Participation*.

It is evident from these examples that *User Generated Content* can enable *Group Participation* at different levels, as the learners involved in the conversations do not always come from the same assigned groups. Further to this, while there was no instance of a *"Social Collaboration, Group Participation"* occurring at the discipline community group level in the IS2200 data, it is plausible that a discipline community group member could generate and share content, and get responses, or acknowledge original content that was shared. The structure of this cell is thus split into three smaller cells: assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
User Generated Content, Group Participation (4.2.1)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member.
User Generated Content, Group Participation (4.2.2)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member.
User Generated Content, Group Participation (4.2.3)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member.

Table 4-139: SMECLE Evaluation Framework V5.0 Amended Cell Rules for User Generated Content, Group Participation

Amendment 4: User Generated Content, Learner Diversity

User Generated Content is original content created by the learner, or building on previously existing content. *Learner Diversity* occurs when a learner draws on their background to provide different perspectives on task-related information. The assumption for this rule is that when a learner refers to their background when creating and sharing some original content, an instance of *"User Generated Content, Learner Diversity"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Learner Diversity (1,4)	A learner makes a comment in relation to the task, drawing on their background.

Table 4-140: SMECLE Evaluation Framework V4.0 Cell Rule for Social Interaction, Learner Diversity

In this case, the data from IS6118 highlights that the structure of the cell is too broad, where the cell assumes that all *"User Generated Content, Learner Diversity"* instances occur at a single level. Consider the following blog posts/comments from IS6118:

Example 1

User Generated Content, Learner Diversity		
Blog Reference: G13B11	**Learner Name:** 1rguru	**Assessment**
I have also encountered this while working in finance. A new IS system called 'Powersim' was being introduced to the company to help forecast figures many years into the future. The call to introduce this system was made by the head of Finance who saw the system benefiting the company in the long term. *However the people using the new system, who would normally have used Microsoft Excel to generate the figures found the new system as a hindrance. As the system was only in the Implementation stage there where many problems with it, however after a few months the system would be 'bug free' and would save the company a lot of time in a process that would have normally taken about a month could now be done in a week.* *However the issue here is that the people in finance would revert back to using Excel because they had no faith in this new system. Instead of the finance department being in control of these forecasts the IT department where now also heavily involved.* *I believe the main issue here is the resistance to change. (Coch and French 1948) said that resistance to change is normal. ''A large percentage of IS projects fail because the process of organisational change surrounding system building was not properly addressed. Successful system building requires careful Change Management.'' (Laudon 2006)*		A learner makes a comment on a blog post, where they provide an example of a new system being implemented into an organisation they were working at, and how it impacted their work.

Table 4-141: Phase 5, Amendment 1: User Generated Content, Learner Diversity

Example 2

<table>
<tr><th colspan="3">User Generated Content, Learner Diversity</th></tr>
<tr><td>Blog Reference:
G2B2</td><td>Learner Name:
ReturnOfDaMc</td><td>Assessment</td></tr>
<tr><td colspan="2">To try and grasp the concept I asked a work colleague from EMC her opinion on “Process Management and Reengineering”, she is a senior process engineer so I thought her opinion might be valuable.

She gave me her answer in two points and sent along the picture at the bottom of the page;

“Focus on a certain process, define a process to look at from start to finish as opposed to just looking at things in general, and decide to own it. The important word here is focus i think. When you look at improving things, if you just look at something that’s broken and fix it, it’s all well and good, but it may not improve the entire process as a whole.”
“That’s where re-engineering comes into stage. Once you know what process you want to improve, then you study it. An objective is required, you first need to measure the capability of your current process (up to you to define the measurement, as it depends on the type of process), then set your objective, could be a % improvement, could be a new value. Then, find the imbalances, and fix the bottleneck. Then the whole process is improved.”</td><td>A learner provides some original content in the form of text, where they get the opinion of a work colleague on the topic that they are discussing, where they draw on their background to provide it.</td></tr>
<tr><td colspan="3">In response to ReturnOfDaMc</td></tr>
<tr><td>Blog Reference:
G2B2</td><td>Learner Name:
ismisetusa</td><td>Assessment</td></tr>
<tr><td colspan="2">hey, think it is quite a good explanation! as you said at the beginning, it is very difficult to understand business jargon if you come from different backgrounds</td><td>An assigned group member acknowledges this original content, indicating that they thought it was a good explanation.</td></tr>
</table>

and you managed to explain it excellently! *when I was reading up on the topic it explained the differences between Business Process Management and Business Process Reengineering which I found useful!* *Well done, Zoology chic!*	

Table 4-142: Phase 5, Amendment 1: User Generated Content, Learner Diversity

Example 3

<table>
<tr><th colspan="3">User Generated Content, Learner Diversity</th></tr>
<tr><td>Blog Reference:
G8B6</td><td>Learner Name:
ismisetusa</td><td>Assessment</td></tr>
<tr><td colspan="2">Reading through the other blogs I am torn between opinions. Personally I am likely to agree with returnofthemc, and disagree with pm1083.

As an individual customer (ignoring for a moment the business aspect) I believe that Microsoft are indeed too late. I personally would have little knowledge of tablets and would do extensive research on purchasing one. yet it is this reason that I believe that ye may be underestimating the absolute power of the apple brand. Without personally owning many apple products I am still more than aware of their products, customer services, deals and the overall global scale of this company.</td><td>A learner provides some original content in the form of text, where they draw on their background to explaining their understanding about Microsoft in a certain market.</td></tr>
<tr><td colspan="3">In response to ismisetusa</td></tr>
<tr><td>Blog Reference:
G8B6</td><td>Learner Name:
davidoppermann</td><td>Assessment</td></tr>
<tr><td colspan="2">Lets not drift away from the original blog. I think we'll agree that the iPad is the most widely sold and used tab on the market today as a whole, but using an iPad in a business environment just doesn't seem to be a practical solution due to majority of company's who have not adapted to apples operating system (iOS). The use of android tabs (Samsung tab) could be a potential tab for business use but using an android open source operating system within a company may cause security problems within an organisations network.Hence why a Microsoft tab may provide this solution as a bring-your-own-devices (BYOD) by where employees use tabs and smartphones as opposed to outdated PCs and desktops. MS surface could bring</td><td>A class group member acknowledges this original content by responding to the comment that was made.</td></tr>
</table>

functionality that the iPad lacks but also offers security and reliability that the android tabs (Samsung) cannot promise to companies.	

Table 4-143: Phase 5, Amendment 1: User Generated Content, Learner Diversity

Under the current rule, each of these interactions would be considered as instances of *"User Generated Content, Learner Diversity"* as in each one a learner creates and shares some original content, and drawing on their background when doing so. However, it is evident from these examples that *User Generated Content* can enable *Learner Diversity* at different levels, as the learner in the first example does not get any acknowledgement, thus it was only beneficial to them, while the learner in the second example gets an acknowledgement by an assigned group member, while the learner in the third example gets an acknowledgement from a class group member, showing it was beneficial at those levels. Further to this, while there was no instance of a *"User Generated Content, Learner Diversity"* occurring at the discipline community group level in the IS6118 data, it is plausible that a discipline community group member could acknowledge some original content that has been shared. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect this learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Interaction, Learner Diversity (1.4.1)	Individual	A learner creates, and shares some original content in relation to the task, drawing on their background, but no group member acknowledges it.
Social Interaction, Learner Diversity (1.4.2)	Assigned Group	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.
Social Interaction, Learner Diversity (1.4.3)	Class Group	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one class group member acknowledges it.
Social Interaction, Learner Diversity (1.4.4)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.

Table 4-144: SMECLE Evaluation Framework V5.0 Amended Rules for Social Interaction, Learner Diversity

Retrospective Review of Cells and Rules

With these three rules amended, a retrospective review of the other cells was undertaken, reviewing their rules with respect to the new learning that was acquired. However, no clear anomalies were identified, so no further rules needed to be amended.

4.1.1.2 Building SMECLE Evaluation Framework 5.0

SMECLE evaluation framework V5.0 is presented in Figure 4-13. There are structural changes to two of the cells, *“Content Sharing, Group Participation”*, and *“User Generated Content, Group Participation”*, and this resulted in new rules being created for them. No further cells or rules were amended, so the framework must not be evaluated by a new data set to test it, and this is presented next.

			Task												
			Collaborative Learning Characteristics												
			Active Learning				Group Participation			Role of the Instructor	Learner Diversity				Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG		I	AG	CG	DCG	
Social Media Platform	**Social Media Characteristics**	Social Interaction	1.1.1	1.1.2	1.1.3	1.1.4	1.2.1	1.2.2	1.2.3	1.3	1.4.1	1.4.2	1.4.3	1.4.4	1.5
		Social Collaboration	2.1.1	2.1.2	2.1.3	2.1.4	2.2.1	2.2.2	2.2.3	2.3	2.4				2.5
		Content Sharing	3.1.1	3.1.2	3.1.3	3.1.4	3.2.1	3.2.2	3.2.3	3.3	3.4				3.5
		User Generated Content	4.1.1	4.1.2	4.1.3	4.1.4	4.2.1	4.2.2	4.2.3	4.3	4.4.1	4.4.2	4.4.3	4.4.4	4.5
		Social Connectedness	5.1				5.2			5.3	5.4				5.5

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-13: SMECLE Evaluation Framework V5.0

4.1.2 Evaluating the SMECLE Framework V5.0

Analysis of IS1100 with SMECLE Evaluation Framework V5.0

In this phase, the two-step evaluation was executed. First the researcher evaluated the framework for its usefulness. Then, in a two hour evaluation session with two senior educators, the effective, and ineffective, cell rules, and/or cell structures, were discussed. The first data set to be analysed with SMECLE evaluation framework V5.0 is IS1100, which is a blog enabled CLE. This consisted of 307 blog posts, and 1032 blog comments, and presented in Figure 4-14 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 14 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended. Examples of the two cells that were amended in the design and build section are provided next, followed by another evaluation of the framework with a different data set.

			Each group is assigned a topic, and for seven weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.												
			Collaborative Learning Characteristics												
			Active Learning				Group Participation			Role of the Instructor	Learner Diversity				Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG		I	AG	CG	DCG	
`Blog	Social Media Characteristics	Social Interaction		X	X			X		X	X				X
		Social Collaboration	X	X	X		X	X							X
		Content Sharing	X	X	X		X	X							X
		User Generated Content	X	X	X		X	X							X
		Social Connectedness													

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-14: IS1100 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

4.1.2.1 Compatible Cells

The two amended cells, and their rules, from the design and build section of this phase were demonstrated to be appropriate, and an example of each of them is presented next.

Content Sharing, Group Participation

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner shares some content, and at least one group member acknowledges it, which is further acknowledged by another group member, and a consensual answer is reached, an instance of *"Content Sharing, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
Content Sharing, Group Participation (3.2.1)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.
Content Sharing, Group Participation (3.2.2)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.
Content Sharing, Group Participation (3.2.3)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 4-145: SMECLE Evaluation Framework V5.0 Cell Rules for Content Sharing, Group Participation

An example of each of these occurring is:

Assigned Group

There was no instance of this in IS1100.

Class Group

Content Sharing, Group Participation: Class Group Level		
Blog Reference: G5B21	**Learner Name:** oozz111453072	**Assessment**
Very interesting piece. A different approach to the topic taken, and covered very well. This article below lists a few different failures by major companies throughout the world. Interesting reading, as it may not have been widely known. http://www.computerworld.com/computerworld/records/images/pdf/44NfailChart.pdf		A learner shares a link to an article *(Content Sharing)* in relation to the task, and shows their understanding of it by explaining what it covers.
In response to oozz111453072		
Blog Reference: G5B21	**Learner Name:** oozz111453072	**Assessment**
great article some very interesting examples of the failure of information systems just goes to show how important researching a system is before implementing it on a full scale in a business		A class group member acknowledges the shared content by commenting on its contents *(Group Participation)*.
In response to oozz111453072		
Blog Reference: G5B21	**Learner Name:** oozz111453072	**Assessment**
Thanks for the post, I ageree with the comments suggesting that an example of an IS would contribute to the overall understanding of the topic. It attenmpts to keep it brief and informative, it certainly lacked an example!		This is further acknowledged by the learner who wrote the blog post, who agrees with the comments, and a consensus is reached *(Group Participation)*. As the learner who acknowledged it was not an assigned group member, but a class group member, this instance occurred at a class group level.

Table 4-146: Phase 5 Compatible Cell of Content Sharing, Group Participation: Class Group Level

Discipline Community

There was no instance of this in IS1100.

User Generated Content, Group Participation

User Generated Content is original content created by the learner, or building on previously existing content. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner creates and shares some original content, and at least one group member acknowledges it, which is further acknowledged by another group member, an instance of *"Content Sharing, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
User Generated Content, Group Participation (4.2.1)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.
User Generated Content, Group Participation (4.2.2)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.
User Generated Content, Group Participation (4.2.3)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 4-147: SMECLE Evaluation Framework V5.0 Cell Rules for User Generated Content, Group Participation

An example of each of these occurring is:

Assigned Group

There was no instance of this in IS1100.

Class Group

User Generated Content, Group Participation: Class Group Level		
Blog Reference: G10B9	**Learner Name:** oozz112312521	**Assessment**
In my opinion, user feedback is the primary indicator on whether the implementation is a success or not. If users have problems with it, their input has to be heard immediately or else the system will be in trouble.		A learner creates some original content *(User Generated Content)* by giving their opinion, in relation to the task.
In response to oozz112312521		
Blog Reference: G10B9	**Learner Name:** oozz111337061	**Assessment**
I agree with your comment that user feed back in primary on deciding whether an implementation is a failure or a success but it can fail on many other levels such as if it costs too much, or if it isn't run efficiently. The user may find the system working well but on another level it may fail.		A class group member acknowledges this content, and agrees with the learner *(Group Participation).*
In response to oozz111337061 and oozz111337061		
Blog Reference: G10B9	**Learner Name:** oozz112360721	**Assessment**
I agree with the comment above if system users are having issues with the IS has it not ultimately failed?		This is further acknowledged by another class group member *(Group Participation).*
In response to oozz112360721		
Blog Reference: G10B9	**Learner Name:** oozz112323436	**Assessment**
That was my aim in this article, to look at the users perspective and role in IS implementation.		The learner who wrote the blog post then acknowledges this comment, and a consensus is reached *(Group Participation).* As the learner who acknowledged the original content was not an assigned group member, but a class group member, this instance occurred at a class group level.

Table 4-148: Phase 5 Compatible Cell of User Generated Content, Group Participation: Class Group Level

Discipline Community

There was no instance of this in IS1100.

4.1.2.2 Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of a social media characteristic enabling a characteristic of collaborative learning. There were no cells identified as being ineffective with the DS 1100 data set. To evaluate the usefulness of the SMECLE evaluation framework V5.0 further, a second blog enabled CLE will be analysed, with DS 2200 being the data set. This analysis is presented next.

Analysis of IS2200 with SMECLE Evaluation Framework V5.0

The second data set to be analysed with SMECLE evaluation framework V5.0 is IS2200, which is a blog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V3.0. Presented in Figure 4-15 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 15 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended. Examples of the two cells that were amended in the design and build section are provided next, followed by another evaluation of the framework with a different data set.

			Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.												
			Collaborative Learning Characteristics												
			Active Learning				Group Participation			Role of the Instructor	Learner Diversity				Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG		I	AG	CG	DCG	
Blog	**Social Media Characteristics**	Social Interaction		X	X		X	X		X	X		X		X
		Social Collaboration	X	X	X		X	X							X
		Content Sharing	X	X	X		X	X							X
		User Generated Content	X	X	X		X	X		X	X				X
		Social Connectedness													

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-15: IS2200 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

4.1.2.3 Compatible Cells

The following examples are of the two amended cells from the design and build phase.

Content Sharing, Group Participation

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner shares some content, and at least one group member acknowledges it, which is further acknowledged by another group member, and a consensual answer is reached, an instance of *"Content Sharing, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
Content Sharing, Group Participation (3.2.1)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.
Content Sharing, Group Participation (3.2.2)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.
Content Sharing, Group Participation (3.2.3)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 4-149: SMECLE Evaluation Framework V5.0 Cell Rules for Content Sharing, Group Participation

An example of each of these occurring is:

Assigned Group

Content Sharing, Group Participation: Assigned Group Level		
Blog Reference: G45B1	**Learner Name:** sad112540853	**Assessment**
I came across a fantastic article today, and highly recommend reading it. It is about the importance of a good information management system.		A learner shares a link to an article *(Content Sharing)* in relation to the task.
In response to sad112540853		
Blog Reference: G45B1	**Learner Name:** sad112759089	**Assessment**
Found the website link very helpful and interesting, especially all the 10 reasons to have a good management information system.		An assigned group member acknowledges this *(Group Participation)*, stating the content shared was helpful and interesting.
In response to sad112759089		
Blog Reference: G45B1	**Learner Name:** sad112540853	**Assessment**
Thank you ! I'm glad you found it helpful.		This is further acknowledged by the original learner, and a consensus is reached *(Group Participation)*. As the learner who acknowledged it was an assigned group member, this instance occurred at an assigned group level.

Table 4-150: Phase 5 Compatible Cell of Content Sharing, Group Participation: Assigned Group Level

Class Group

Content Sharing, Group Participation: Class Group Level		
Blog Reference: G40B12	**Learner Name:** sad111548123	**Assessment**
According to an article from AMEinfo.com "Recent advances in IT are enabling providers to improve the quality of patient care. Today's healthcare IT is much more than traditional isolated computers and unfriendly applications. Increasingly, patient care is exploiting the new tools and information that systems can provide, while maintaining a patient-centric approach to their use." This clearly shows the improvements information technology can have on the running of hospitals etc. They invest in the technology as they want to provide the best possible care to the individual. This high standard of care is something that many of us will need at some stage in our lives. This has driven the emergence, and growing sophistication of the Electronic Medical Record, (EMR).		A learner shares some text from an article *(Content Sharing)* in relation to the task.
In response to sad111548123		
Blog Reference: G40B12	**Learner Name:** sad111708665	**Assessment**
...excellent blog! loved the video clip and the item from AME magazine was excellent and very informative. I really enjoyed what I learned from your post, thanks a lot :)		A class group member acknowledges this *(Group Participation)*, stating the content shared was excellent and informative.
In response to sad111708665		
Blog Reference: G40B12	**Learner Name:** sad111548123	**Assessment**
Good to hear! Thanks		This is further acknowledged by the original learner, and a consensus is reached *(Group Participation)*. As the learner who acknowledged it was a class group member, this instance occurred at a class group level.

Table 4-151: Phase 5 Compatible Cell of Content Sharing, Group Participation: Class Group Level

Discipline Community

There was no instance of this in IS2200.

User Generated Content, Group Participation

User Generated Content is original content created by the learner, or building on previously existing content. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner creates and shares some original content, and at least one group member acknowledges it, which is further acknowledged by another group member, an instance of *"Content Sharing, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
User Generated Content, Group Participation (4.2.1)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.
User Generated Content, Group Participation (4.2.2)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.
User Generated Content, Group Participation (4.2.3)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 4-152: SMECLE Evaluation Framework V5.0 Cell Rules for User Generated Content, Group Participation

An example of each of these occurring is:

Assigned Group

There was no instance of this in IS2200.

Class Group

Blog Reference: G11B3	**Learner Name:** sad111346901	**Assessment**
Therefore in my opinion, I would believe that in the next 5-10 years the trends in information systems will be fluctuating at a faster rate due to the huge and prominent influence of information technologies and also the internet.		A learner creates some original content *(User Generated Content)* by giving their opinion in relation to the task.
In response to sad111346901		
Blog Reference: G11B3	**Learner Name:** sad111424632	**Assessment**
What makes you so sure that the trends will fluctuate a lot over the nest five to ten years?		A class group member acknowledges this original content and asks them why *(Group Participation)*.
In response to sad111424632		
Blog Reference: G11B3	**Learner Name:** sad111346901	**Assessment**
I'm not sure i'm just speculating that thats the most likely way for IS to head towards in the next few years giving that the internet has a huge role in most peoples daily lives.		The original learner then acknowledges this by answering the question, and a consensus is reached *(Group Participation)*. As the learner who acknowledged it was a class group member, this instance occurred at a class group level.

Table 4-153: Phase 5 Compatible Cell of User Generated Content, Group Participation: Class Group Level

Discipline Community

There was no instance of this in IS2200.

4.1.2.4 Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of a social media characteristic enabling a characteristic of collaborative learning. There were no cells identified as being ineffective with the IS2200 data set. This is the second blog enabled CLE where this has been the case, so it is now necessary to evaluate the usefulness of the SMECLE evaluation framework V5.0 with a different type of SMECLE. IS3101, IS4428, and IS6119 will be analysed, which are microblog enabled CLEs, and this analysis is presented next.

Analysis of IS3101 with SMECLE Evaluation Framework V5.0

The third data set to be analysed with SMECLE evaluation framework V5.0 is IS3101, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V1.0, V3.0, and V4.0. In total there were 13 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended.

Analysis of IS4428 with SMECLE Evaluation Framework V5.0

The fourth data set to be analysed with SMECLE evaluation framework V4.0 is IS4428, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V1.0, and V3.0. In total there were 13 cells with instances, from a possible 25, that occurred at different levels, and all complied with the rules. Therefore there are no incompatible cells, or rules, that need to be amended.

Analysis of IS6119 with SMECLE Evaluation Framework V5.0

The fifth data set to be analysed with SMECLE evaluation framework V5.0 is IS6119, which is a microblog enabled CLE. This was initially used to evaluate SMECLE evaluation framework V1.0, V3.0, and V4.0. Presented in Figure 4-16 are the instances that occurred of a social media characteristic enabling a characteristic of collaborative learning, as indicated by the X. In total there were 13 cells with instances, from a possible 25, that occurred at different levels. From these 13, 7 were demonstrated to comply with the rules, with these instances occurring at different levels. However, the data demonstrated that there were 6 cells that the rules were ineffective at determining when a social media characteristic enabled a characteristic of collaborative learning. Examples of three compatible cells are provided next, followed by an explanation of the six cells that were incompatible, and need to be amended in the next design and build section, in Phase 6.

#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach

			Collaborative Learning Characteristics												
			Active Learning				Group Participation			Role of the Instructor	Learner Diversity				Learner Relationships
			I	AG	CG	DCG	AG	CG	DCG		I	AG	CG	DCG	
Microblog	**Social Media Characteristics**	Social Interaction	X	X	X		X			X					X
		Social Collaboration	X	X			X								X
		Content Sharing	X	X			X								X
		User Generated Content	X	X	X					X					X
		Social Connectedness													

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

Figure 4-16: IS6119 Instances of Social Media Characteristics enabling Collaborative Learning Characteristics

4.1.2.5 Compatible Cells

The following examples are of three cells that were demonstrated to be compatible from the analysis.

Social Interaction, Group Participation

A *Social Interaction* occurs when a learner makes a comment. *Group Participation* occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. The assumption for this rule is that at least two learners need to be involved for *Group Participation* to occur, and there needs to be at least three instances of an interaction, where if a learner makes a comment, and at least one group member acknowledges it, which is further acknowledged by another group member, and a consensual answer is reached, an instance of *"Social Interaction, Group Participation"* has occurred. Depending on who acknowledges the comment, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rule was set as follows:

Cell	Level	Rules
Social Interaction, Group Participation (1.2.1)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member.
Social Interaction, Group Participation (1.2.2)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member.
Social Interaction, Group Participation (1.2.3)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member.

Table 4-154: SMECLE Evaluation Framework V5.0 Cell Rules for Social Interaction, Group Participation

Assigned Group

Social Interaction, Group Participation: Assigned Group Level		
Tweet Reference: G7T19	**Learner Name:** @ISBP111223912	**Assessment**
#Group7 Are we all taking a different area of outsourcing? i will look at selective so		A learner makes a comment *(Social Interaction)* in relation to the task, where they are trying to establish what the group are doing.
In response to @ISBP111223912		
Tweet Reference: G7T20	**Learner Name:** @ISBP107511108	**Assessment**
#Group7 Hey Martin, ya i think we are all taking a different area of outsourcing. Mark, what area are you doing?		An assigned group member acknowledges the comment *(Group Participation)* and answers their question.
In response to @ISBP107511108		
Tweet Reference: G7T21	**Learner Name:** @ISBP107379412	**Assessment**
#isbpgroup7, @ISBP107511108, sure i can look at selective there so		This is further acknowledged by the original learner, who provides the area they are going to look at, and a consensus is reached *(Group Participation)*. As the learner who acknowledged the comment was an assigned group member, this instance occurred at an assigned group level.

Table 4-155: Phase 5 Compatible Cell of Social Interaction, Group Participation: Assigned Group Level

Class Group

There was no instance of this in IS6119.

Discipline Community Group

There was no instance of this in IS6119.

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if learners ask questions of other learners, or agree/disagree with other learners, in relation to the task, and explain why, an instance of *"Social Collaboration, Active Learning"* has occurred. Depending on who asks the questions, or agrees/disagrees, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rules were set as follows:

Cell	Level	Rules
Social Collaboration, Active Learning (2.1.1)	Assigned Group	An assigned group member asks another assigned group member(s) a question(s) in relation to the task. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.2)	Class Group	A class group member asks another class group member(s) a question(s) in relation to the task. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.3)	Discipline Community Group	A discipline community member asks a class group member(s) a question(s) in relation to the task. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why.

Table 4-156: SMECLE Evaluation Framework V5.0 Cell Rules for Social Collaboration, Active Learning

An example of each of these occurring is:

Assigned Group

Social Collaboration, Active Learning: Assigned Group Level		
Tweet Reference: G3T8	**Learner Name:** @ISBP107463430	**Assessment**
Excellent, but should we mention something about cloud computing?		An assigned group member asks a question *(Social Collaboration)* in relation to the task, about a possible topic they could look at, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP107463430		
Tweet Reference: G3T10	**Learner Name:** @isbp103464679	**Assessment**
@ISBP107463430 @ISBP111223107 Yeah sure! "Sailing the cloud: Case study..." Sarkar and Young 2011 #Group 3 #Cloud Computing		An assigned group member responds, where they agree *(Social Collaboration)* with the additional topic, and explain by providing a title to a possible article to look at, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. The learners in this case are assigned group members so this instance occurred at an assigned group level.

Table 4-157: Phase 5 Compatible Cell of Social Collaboration, Active Learning: Assigned Group Level

Class Group

There was no instance of this in IS6119.

Discipline Group

There was no instance of this in IS6119.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are actively learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rule was set as follows:

Cell	Level	Rules
Content Sharing, Active Learning (3.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (3.1.2)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it.
Content Sharing, Active Learning (3.1.3)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it.
Content Sharing, Active Learning (3.1.4)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it.

Table 4-158: SMECLE Evaluation Framework V5.0 Cell Rules for Content Sharing, Active Learning

An example of each of these occurring is:

Individual

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G1T35	**Learner Name:** @ISBP106443290	**Assessment**
@ISBP96556021 http://edit752.pbworks.com/f/Outsource_CaseStudies.pdf … this could be helpful for you Shane		A learner shares a link to an article with another learner *(Content Sharing)* in relation to the task, and by explaining it could be helpful for them, they indicate they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. No other learner acknowledges the content that was shared, therefore the instance has occurred at an individual level.

Table 4-159: Phase 5 Compatible Cell of Content Sharing, Active Learning: Individual Level

Assigned Group

Content Sharing, Active Learning: Assigned Group Level		
Tweet Reference: G7T30	**Learner Name:** @ISBP106006850	**Assessment**
@ISBP107379412 read this first and get back to mehttp://is2.lse.ac.uk/asp/aspecis/20060071.pdf …		A learner shares a link to an article with an assigned group member *(Content Sharing)* in relation to the task, and by suggesting that it could benefit them, they indicate they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP106006850		
Tweet Reference: G7T32	**Learner Name:** @ISBP107379412	**Assessment**
@ISBP106006850 interesting but i think its overarching point is undermined by the low response rate, see its methodology		An assigned group member acknowledges this content by commenting on it, but disagrees with it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner got an acknowledgement on the content they shared from an assigned group member, the *Active Learning* has occurred at an assigned group level.

Table 4-160: Phase 5 Compatible Cell of Content Sharing, Active Learning: Individual Level

Class Group

There was no instance of this in IS6119.

Discipline Group

There was no instance of this in IS6119.

4.1.2.6 Incompatible Cells

Incompatible cells consist of cells that were identified as being ineffective at classifying instances of a social media characteristic enabling a characteristic of collaborative learning. Six cells were identified as being ineffective with the IS6119 data set, which are presented in Table 4-161, with the issues explained. To amend these rules, the data that demonstrated them to be ineffective are used in the design, and build section of Phase 5.

Incompatible Cells	Identified Issue
Social Interaction, Role of the Instructor (1,3)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that the instructor can make comments that can be acknowledged by different group members, such as assigned group members, or the class group.
User Generated Content, Role of the Instructor (4,3)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that the instructor can create and share original content that can be acknowledged by different group members, such as assigned group members, or the class group.
Social Interaction, Learner Relationships (1,5)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that different relationships can be created/strengthened, based on who acknowledges comments that are made.
Social Collaboration, Learner Relationships (2,5)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that different relationships can be created/strengthened, based on who asks questions, or agrees/disagrees with another learner.
Content Sharing, Learner Relationships (3,5)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that different relationships can be created/strengthened, based on who acknowledges content that is shared.
User Generated Content, Role of the Instructor (4,3)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that the instructor can share content that can be acknowledged by different group members, such as assigned group members, or the class group.
Social Connectedness, Learner Relationships (4,5)	The data from IS6119 indicates that this cell itself is too limiting, where it was observed that different relationships can be created/strengthened, based on who acknowledges content that a learner has created, and shared.

Table 4-161: SMECLE Framework V5.0 Incompatible Cell

4.2 Phase 6: Designing, Building, and Evaluating the SMECLE Evaluation Framework V6.0

The purpose of this section is to design and build version six of the SMECLE evaluation framework, and evaluate it with a new data set to test its usefulness. The design and build section for SMECLE evaluation framework V6.0 is informed by the learnings of the evaluation section in Phase 5, with the focus on amending the cells, and their rules, with the aid of the IS6119 data set. The process for evaluating SMECLE evaluation framework V3.0 remains the same as Phase 1, 2, 3, 4, and 5, with five data sets used to evaluate it.

4.2.1 Designing, and Building the SMECLE Evaluation Framework V6.0

4.2.1.1 Designing SMECLE Evaluation Framework Version 6.0

The design and build phase for SMECLE Framework V6.0 involves further structural changes to six cells. These structural changes also require rules to be amended, and the process that was applied in Phase 2, 3, 4, and 5 is again applied here, where the IS6119 data set previously used to evaluate the framework, is now used to create the understanding as to why cells and their rules need to be amended. This process is applied for six cells identified in Phase 5 as being ineffective, and these cells are:

- *"Social Interaction, Role of the Instructor"*
- *"User Generated Content, Role of the Instructor"*
- *"Social Interaction, Learner Relationships"*
- *"Social Collaboration, Learner Relationships"*
- *"Content Sharing, Learner Relationships"*
- *"User Generated Content, Learner Relationships"*

A retrospective review of the other cells is also taken, based on the learning that was derived from these two amendments, and is used to update cells where clear anomalies exist.

Amendment 1: Social Interaction, Role of the Instructor

A *Social Interaction* occurs when a learner makes a comment. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this rule is that anytime an instructor makes a comment in relation to the task, they are fulfilling their role, and an instance of *"Social Interaction, Role of the Instructor"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Role of the Instructor (1,3)	The instructor makes a comment in relation to the task.

Table 4-162: SMECLE Evaluation Framework V5.0 Cell Rule for Social Interaction, Role of the Instructor

In this case, the data from IS6119 highlights the structure of the cell is too broad, where the cell assumes that all *"Social Interaction, Role of the Instructor"* instances occur at a single level. Consider the following tweets from the instructor in IS6119:

Example 1

Social Interaction, Role of the Instructor		
Tweet Reference: I1T2	**Learner Name:** @ISBP93260857	**Assessment**
Please ensure you are communicating with the right group members for the #task		The instructor makes a comment at the start of the class to the learners *(Social Interaction)* in relation to the task, guiding them by trying to ensure everyone is communicating with their right group members *(Role of the Instructor)*. This comment was not acknowledged by any class group members, and at the start a learner could be seen communicating with the wrong group members.

Table 4-163: Phase 6, Amendment 1: Social Interaction, Role of the Instructor

Example 2

Social Interaction, Role of the Instructor		
Tweet Reference: G3T31	**Learner Name:** @isbp103464679	**Assessment**
#group3 definitions will be emailed to u!		A learner makes a comment *(Social Interaction)* in relation to the task, about sending their answers via an email.
In response to @isbp103464679		
Tweet Reference: I1T6	**Learner Name:** @ISBP93260857	**Assessment**
@isbp103464679 will you pop them on twitter		The instructor acknowledges this by making a comment *(Social Interaction)*, guiding the learner by telling them to put their answers on Twitter *(Role of the Instructor)*.
In response to @ISBP93260857		
Tweet Reference: G3T32	**Learner Name:** @isbp103464679	**Assessment**
1 unique aspect of Offshore Outsourcing is that it opens up the marketplace to suppliers globally, enhancing the possibility for cost saving		This is acknowledged by the learner by posting their answer to Twitter.

Table 4-164: Phase 6, Amendment 1: Social Interaction, Role of the Instructor

Example 3

Social Interaction, Role of the Instructor		
Tweet Reference: I1T7	**Learner Name:** @ISBP93260857	**Assessment**
To wrap up the task put your definitions up as tweets. Each group will be presenting their definitions briefly in class next Tuesday.		The instructor makes a comment *(Social Interaction)* in relation to the task, instructing all the groups to put their answers on Twitter *(Role of the Instructor)*. This is acknowledged by class group members by posting their answers to Twitter.

Table 4-165: Phase 6, Amendment 1: Social Interaction, Role of the Instructor

Under the current rule, each of these interactions would be classified as instances of *"Social Interaction, Role of the Instructor"* as in each one the instructor is making a comment in relation to the task. However, it is evident from the three examples above that *Social Interaction* can enable the *Role of the Instructor* at different levels, as the instructor can make a comment and not have it acknowledged, or the can comment at assigned group members, and have it acknowledged, or comment to the class as a whole, and have it acknowledged by class group members. Further to this, while there was no instance of a *"Social Interaction, Role of the Instructor"* occurring at the discipline community group level in the IS6119 data, it is plausible that the instructor can comment at a discipline community group members, and have it acknowledged. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect the new learning, and the rule for the discipline community group cell is inferred from the other rules:

Cell	Level	Rules
Social Interaction, Role of the Instructor (1.4.1)	Individual	The instructor makes a comment in relation to the task, but no group member acknowledges it.
Social Interaction, Role of the Instructor (1.4.2)	Assigned Group	The instructor makes a comment to an assigned group in relation to the task, and at least one assigned group member acknowledges it.
Social Interaction, Role of the Instructor (1.4.3)	Class Group	The instructor makes a comment to the class group in relation to the task, and at least one class group member acknowledges it.
Social Interaction, Role of the Instructor (1.4.4)	Discipline Community Group	The instructor makes a comment to the discipline community group in relation to the task, and at least one discipline community member acknowledges it.

Table 4-166: SMECLE Evaluation Framework V6.0 Amended Cell Rules for Social Interaction, Role of the Instructor

Amendment 2: User Generated Content, Role of the Instructor

User Generated Content is original content created by the learner, or building on previously existing content. The *Role of the Instructor* is to provide a task to be completed, and offer qualified guidance when required. The assumption for this rule is that if the instructor provides some original content towards fulfilling their role, then an instance of *"User Generated Content, Role of the Instructor"* has occurred. The rule is set as follows:

Cell	**Rule**
User Generated Content, Role of the Instructor (4,3)	The instructor creates, and shares some original content in relation to the task.

Table 4-167: SMECLE Evaluation Framework V5.0 Cell Rule for User Generated Content, Role of the Instructor

In this case, the data from IS6119 highlights the structure of the cell is too broad, where the cell assumes that all *"User Generated Content, Role of the Instructor"* instances occur at a single level. Consider the following tweets from the instructor in IS6119:

Example 1

User Generated Content, Role of the Instructor		
Tweet Reference: I1T3	**Learner Name:** @ISBP93260857	**Assessment**
#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach		The instructor creates some original content *(User Generated Content)* in the form of the task for the class *(Role of the Instructor)*, and posts it in a tweet to the class. The class acknowledged this by each group participating in completing the task.

Table 4-168: Phase 6, Amendment 2: User Generated Content, Role of the Instructor

Under the current rule, this interaction would be classified as instances of *"User Generated Content, Role of the Instructor"* as the instructor creates some original content in the form of the task, and shares it with them. However, it is evident that

User Generated Content can enable the *Role of the Instructor* at different levels, as the instructor can create and share original content but not have it acknowledged, or create and share original content with assigned group members, and have it acknowledged, or create and share original content with the class group members, and have it acknowledged (as shown above), or create and share original content with discipline community group members, and have it acknowledged. Also, when learners acknowledge *User Generated Content*, they must show their understanding of it. The structure of this cell is thus split into four smaller cells: individual, assigned group, class group, and discipline community group. The rules are amended to reflect the new learning and the rules for the individual, assigned group, and discipline community group cells are inferred from the rule of the class group cell:

Cell	Level	Rules
User Generated Content, Role of the Instructor (4.3.1)	Individual	The instructor creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Role of the Instructor (4.3.2)	Assigned Group	The instructor creates, and shares some original content in relation to the task to an assigned group, and at least one assigned group member acknowledges it, showing their understanding of it.
User Generated Content, Role of the Instructor (4.3.3)	Class Group	The instructor creates, and shares some original content in relation to the task to the class group, and at least one class group member acknowledges it, showing their understanding of it.
User Generated Content, Role of the Instructor (4.3.4)	Discipline Community Group	The instructor creates, and shares some original content in relation to the task to the discipline community group, and at least one discipline community member acknowledges it, showing their understanding of it.

Table 4-169: SMECLE Evaluation Framework V6.0 Amended Rules for User Generated Content, Role of the Instructor

Learner Relationships

In a CLE, learning is shared amongst the learners and the instructor, where relationships are formed, and strengthened, when learning occurs from instructor-to-learner, learner-to-learner, and learner-to-instructor. From this an understanding is generated, where, for relationships to be formed, or strengthened, there needs to be at least two learners involved, which includes learners from the class group, discipline community group, and the instructor. The evaluation framework currently captures when the instructor interacts with learners, and when learners interact with other learners, and when learners interact with the instructor, through the assigned group, class group, and discipline community group cells. It is therefore possible to measure when each of the instructor-to-learner, learner-to-learner, and learner-to-instructor relationships are formed, or strengthened.

For example, when an instructor makes a comment in relation to the task, and a learner acknowledges it, an instructor-to-learner relationship is formed, or strengthened, as learning has occurred from an instructor to a learner. When a learner makes a comment in relation to the task, and another learner acknowledges it, a learner-to-learner relationship is formed, or strengthened, as learning has occurred from one learner to another learner. Similarly, when a learner makes a comment in relation to the task, and the instructor acknowledges it, a learner-to-instructor relationship is formed, or strengthened, as learning has occurred from one learner to the instructor.

The cells under *Learner Relationships* first need to be restructured to the three levels of instructor-to-learner, learner-to-learner, and learner-to-instructor. Then, the rules need to be created for when an instance occurs in each: for instructor-to-learner relationships, it is each instance of when the instructor fulfils their role and get at least one acknowledgement from a learner. For learner-to-learner relationships it is each instance of when a learner actively learns, participates in a group, or draws on their diversity, and get at least one acknowledgement. For learner-to-instructor relationships, it is each instance of when a learner interacts with the instructor, and gets at least one acknowledgement. This new learning requires that each *Learner Relationship* cell to be restructured, and the rules to be amended, which is done next.

Amendment 3: Social Interaction, Learner Relationships

A *Social Interaction* occurs when a learner makes a comment. *Learner Relationships* occur from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is when a learner makes a comment in relation to a task, and someone acknowledges it, a relationship is formed, or strengthened, between the learners, and an instance of *"Social Interaction, Learner Relationships"* has occurred. The rule was set as follows:

Cell	Rule
Social Interaction, Learner Relationships (1,5)	A relationship is formed, or strengthened, based on a comment that is in relation to the task.

Table 4-170: SMECLE Evaluation Framework V5.0 Cell Rule for Social Interaction, Learner Relationships

With the restructured cells, and the new understanding of how an instance occurs in each one, the assumption for this cell has now changed to, depending on who makes the comment, and who acknowledges it, a relationship is formed, or strengthened, at that particular level. The rules for each of these cells are informed from this new understanding, and are set as:

Cell	Level	Rules
Social Interaction, Learner Relationships (1.5.1)	Instructor-to-Learner	A relationship is formed, or strengthened, when an instructor makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Social Interaction, Learner Relationships (1.5.2)	Learner-to-Learner	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Social Interaction, Learner Relationships (1.5.3)	Learner-to-Instructor	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and an instructor acknowledges it.

Table 4-171: SMECLE Evaluation Framework V6.0 Amended Rule for Social Interaction, Learner Relationships

Amendment 4: Social Collaboration, Learner Relationships

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Learner Relationships* occur from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is when a learner asks a question, or agrees/disagrees with another learner, and someone acknowledges it, a relationship is formed, or strengthened, between the learners and an instance of *"Social Collaboration, Learner Relationships"* has occurred. The rule was set as follows:

Cell	Rule
Social Collaboration, Learner Relationships (2,5)	A relationship is formed, or strengthened, from asking question(s) that are in relation to the task. or A relationship is formed, or strengthened, from agreeing with the content that is in relation to the task.

Table 4-172: SMECLE Evaluation Framework V5.0 Cell Rule for Social Collaboration, Learner Relationships

With the restructured cells, and the new understanding of how an instance occurs in each one, the assumption for this cell has now changed to, where depending on who asks the question, or who agrees/disagrees, and who acknowledges this, a relationship is formed, or strengthened, at that particular level. The rules for each of these cells are informed from this new understanding, and are set as:

Cell	Level	Rules
Social Collaboration, Learner Relationships (2.5.1)	Instructor-to-Learner	A relationship is formed, or strengthened, when an instructor asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when an instructor agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.
Social Collaboration, Learner Relationships (2.5.2)	Learner-to-Learner	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.
Social Collaboration, Learner Relationships (2.5.3)	Learner-to-Instructor	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, and an instructor acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and an instructor acknowledges it.

Table 4-173: SMECLE Evaluation Framework V6.0 Amended Rule for Social Collaboration, Learner Relationships

Amendment 5: Content Sharing, Learner Relationships

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Learner Relationships* occur from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is when a learner shares some content in relation to the task, and someone acknowledges it, a relationship is formed or strengthened between the learners, and an instance of *"Content Sharing, Learner Relationships"* has occurred. The rule was set as follows:

Cell	Rule
Content Sharing, Learner Relationships (3,5)	A relationship is formed, or strengthened, based on the sharing of content that is in relation to the task.

Table 4-174: SMECLE Evaluation Framework V5.0 Cell Rule for Content Sharing, Learner Relationships

With the restructured cells, and the new understanding of how an instance occurs in each one, the assumption for this cell has now changed to, depending on who shares content, and who acknowledges it, a relationship is formed, or strengthened, at that particular level. The rules for each of these cells are informed from this new understanding, and are set as:

Cell	Level	Rules
Content Sharing, Learner Relationships (3.5.1)	Instructor-to-Learner	A relationship is formed, or strengthened, when an instructor shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Content Sharing, Learner Relationships (3.5.2)	Learner-to-Learner	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Content Sharing, Learner Relationships (3.5.3)	Learner-to-Instructor	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and an instructor acknowledges it.

Table 4-175: SMECLE Evaluation Framework V6.0 Amended Rule for Content Sharing, Learner Relationships

Amendment 6: User Generated Content, Learner Relationships

User Generated Content is original content created by the learner, or building on previously existing content. *Learner Relationships* occur from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is when a learner creates and shares it some original content, and a learner acknowledges it, a relationship is formed or strengthened between the learners, and an instance of *"User Generated Content, Learner Relationships"* has occurred. The rule was set as follows:

Cell	Rule
User Generated Content, Learner Relationships (4,5)	A relationship is formed or strengthened based on creation and sharing of some original content that is in relation to the task.

Table 4-176: SMECLE Evaluation Framework V5.0 Cell Rule for User Generated Content, Learner Relationships

With the restructured cells, and the new understanding of how an instance occurs in each one, the assumption for this cell has now changed to, depending on who creates and shares original content, and who acknowledges it, a relationship is formed, or strengthened, at that particular level. The rules for each of these cells are informed from this new understanding, and are set as:

Cell	Level	Rules
User Generated Content, Learner Relationships (4.5.1)	Instructor-to-Learner	A relationship is formed, or strengthened, when an instructor creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
User Generated Content, Learner Relationships (4.5.2)	Learner-to-Learner	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
User Generated Content, Learner Relationships (4.5.3)	Learner-to-Instructor	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and an instructor acknowledges it.

Table 4-177: SMECLE Evaluation Framework V6.0 Amended Rule for User Generated Content, Learner Relationships

Retrospective Review of Cells and Rules

With these three rules amended, a retrospective review of the other cells was undertaken, reviewing their rules with respect to the new learning that was acquired. However, no clear anomalies were identified, so no further rules needed to be amended.

4.2.1.2 Building SMECLE Evaluation Framework 6.0

SMECLE evaluation framework V6.0 is presented in Figure 4-17. There are structural changes to six of the cells, *"Content Sharing, Group Participation"*, *"User Generated Content, Group Participation", "Social Interaction, Learner Relationships", "Social Collaboration, Learner Relationships", "Content Sharing, Learner Relationships",* and *"User Generated Content, Learner Relationships"*, which resulted in new rules being created for each. No further cells or rules were amended, so the framework must now be evaluated by a new data set, and this is presented next.

			Task																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Social Media Platform	**Social Media Characteristics**	Social Interaction																		
		Social Collaboration																		
		Content Sharing																		
		User Generated Content																		
		Social Connectedness																		

I = Individual
AG = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Figure 4-17: SMECLE Evaluation Framework V6.0

4.2.2 Evaluating the SMECLE Evaluation Framework V6.0

All six of the SMECLE data sets were analysed with SMECLE evaluation framework 6.0, but no rule changes, or cell structure changes were identified as being necessary. The completed SMECLE evaluation framework is thus presented in Figure 4-17, and the rules for the cells can be viewed in Section 6.2.2 of Chapter 6 as contributions of this study. The findings from this analysis are introduced in the next chapter.

4.3 Summary

The question addressed in this chapter was *what are the 'design', 'build', and 'evaluation' tasks needed to implement a Social Media Enabled Collaborative Learning Environment evaluation framework?* In addressing this question, the first design cycle, referred to as Phase 1, was completed by reviewing the IS literature on social media, and collaborative learning, to explain the building blocks of the SMECLE evaluation framework. From this, six platforms of social media were identified and explained, five characteristics of social media were identified and explained, and five characteristics of collaborative learning were identified and explained. Each of these were then used to build the evaluation framework. Then, an evaluation of the SMECLE evaluation framework was conducted, which consisted of utilising the framework as it is intended, to analyse data from a SMECLE. The building blocks were demonstrated to be effective, but a number of rules were identified as being ineffective at analysing the data, so the evaluation framework had not helped achieve the objective. The learning was noted, and used in the next phase to redesign, and rebuild the evaluation framework, thus, the next design and build phase did not require a literature review, but instead focused on applying the learning from the previous phase. This continued for six phases, where rules, and cell structures, were identified as being ineffective at analysing the different data sets that were used, until at the evaluation stage of Phase 6, no more rule changes, or cell structures, were identified as being ineffective. Instead, each data set was successfully analysed with the SMECLE evaluation framework, and the trends that were identified across them are introduced in the following chapter.

Chapter 5 Evaluation of Microblog Enabled CLEs and Blog Enabled CLEs

5.1 Introduction

Instantiating an artefact involves using it for its intended purpose, observing the results, and reporting on them. From this, knowledge can be generated, which can be useful to the knowledge base and/or the practitioners that the artefact is intended for. Thus, Chapter 5 consists of instantiating the SMECLE evaluation framework by using it to evaluate two types of SMECLEs, namely microblog enabled CLEs, and blog enabled CLEs, where the interesting trends are observed and reported. First a cross comparison of the findings for the three microblog enabled CLEs that were evaluated as part of this study is presented. This is followed by a cross comparison of the findings from the three blog enabled CLEs. The individual analysis of each of these microblog and blog cases can be viewed in Appendix A and B respectfully.

The research question to be addressed in this chapter is w*hat are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?* To help answer this question, the trends that occurred in each microblog enabled CLE are compared and discussed, as are the blog enabled CLEs, and these are presented as *task based trends*, *characteristic based trends*, and *cell based trends*. *Task based trends* refer to the trends that were observed in the learning environments relating to how learners attempted to solve the task. *Characteristic based trends* are the trends that were observed in the learning environment relating to each of the collaborative learning characteristics. Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. The following section introduces the cross comparison of the three microblog enabled CLEs, which is followed by the cross comparison of the three blog enabled CLEs. The final section concludes with a summary of the chapter.

5.2 Cross Comparison of the Microblog Enabled Collaborative Learning Environments

With the three microblog enabled CLEs evaluated using the SMECLE evaluation framework (see Appendix A), a cross comparison is presented in Figure 5-1. A number of trends are highlighted, and some of these are introduced next, again under the headings of *task based trends, characteristic based trends*, and *cell based trends*.

Microblog	Social Media Characteristics		Task																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
	Social Interaction	IS6119	59	18	1		2			3	3							3	26	
		IS3101	16	14			1			2									13	2
		IS4428	33	30			2			10									29	
	Social Collaboration	IS6119	28	16			4												20	
		IS3101	10	15			6												14	
		IS4428	4	6		1	2		1										7	
	Content Sharing	IS6119	124	6			1												8	
		IS3101	24	2															3	
		IS4428	105	6	2		2												11	
	User Generated Content	IS6119	23	4	1							1							8	
		IS3101	7	15			2				3	1							9	
		IS4428	9	7		1	1					1							5	
	Social Connectedness	IS6119																		
		IS3101																		
		IS4428																		

I = Individual
AG = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure 5-1: Cross Case Comparison of Microblog Enabled Collaborative Learning Environments

5.2.1 Task Based Trend: Task Draws Similarities and Differences

The tasks for IS6119 and IS4428 were similar, where the assigned groups were required to define different concepts for a given topic, the difference being that the IS6119 groups could decide what topics to focus on, but IS4428 was given the exact topics to focus on. IS3101 had a different task, where the assigned groups had to answer a specific question, which encouraged them to discuss their answer. While the majority of groups across all three of the environments provided answers to their respective tasks, how they created these answers varied depending on the task that was set. For example, IS6119 learners took a more cooperative approach to completing the task, where the majority of the groups decided to divide the task up between the members, where each member would take a topic, and they were responsible for defining that topic. This prevented collaborative learning somewhat, as is evidenced by the low assigned group, class group, and discipline community group instances for *Group Participation*, and *Learner Diversity*, shown in Figure 5-1. It is also the case for the class group and discipline community group instances for *Active Learning*.

The learners in IS4428 took two approaches to answering their task, which was similar to the IS6119 task. The majority of the groups took the approach of naming one of the topics they needed to define, and then they shared as much content that related to that topic as possible, with few questions, or agreement/disagreement occurring amongst group members. One group took the same cooperative approach as was observed in IS6119, where the learners of the assigned group divided the task between each other, and then each learner focused only on their topic. Both of these approaches again prevented more collaborative learning occurring, as is evidenced by the low assigned group, class group, and discipline community group instances for *Group Participation*, and *Learner Diversity*, shown in Figure 5-1. It is also the case for the class group and discipline community group instances for *Active Learning*.

These observations are in contrast to IS3101, where the task was different. As the learners were required to answer a question, they needed to discuss possible answers to that question, and this was evidenced by the discussions that occurred in the environment, evidenced by the majority of assigned group instances for *Active Learning*, shown in Figure 5-1. The task appears to have encouraged much more content to be generated by the learners themselves, as they needed to provide their own opinions on the task. It also encouraged discussion in the form of learners asking questions of each other, and agreeing with what others were saying. This was an excellent example of *Social Collaboration* enabling *Active Learning*, and *Group Participation*.

The three environments also shared other common abilities, such as the task based discussions on how they were going to be completed, and how they were going to provide their answers, as is evidenced by the sixty-two assigned group instances for *"Social Interaction, Active Learning"* in Figure 5-1. However, it is also evident that a lot of this discussion only occurred at the individual level. Also, despite the task that was set, there was still little *Group Participation* observed, and no *Learner Diversity* at all, across the three environments. This suggests that learners were rarely getting involved in deeper discussions with their assigned groups, or any of the other groups. They also did not draw on their backgrounds in relation to the task. The next section explains the *task based trend* that was observed.

5.2.2 Characteristic Based Trend: Learner-to-Learner Relationships

A *Learner Relationship* occurs from instructor-to-learner (I-L), learner-to-learner (L-L), or learner-to-instructor (L-I), where learning is multidirectional. This can be enabled by any of the social media characteristics, from discussing the task, and getting an acknowledgement (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, and getting an acknowledgement (*Social Collaboration*), sharing some content, and getting an acknowledgement (*Content Sharing*), and generating some content, and sharing it, and getting an acknowledgement (*User Generated Content*). Depending on who acknowledges it, the *Learner Relationships* can occur at three different levels: instructor-to-learner, learner-to-learner, and learner-to-instructor. It is expected in a CLE that the majority of relationships that get formed or strengthened would be learner-to-learner, as it should be learners interacting with each other, and only receiving guidance when required from the instructor.

As shown in Table 5-1, four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships* to be formed or strengthened across each of the three SMECLEs. It was also observed that there was at least one instance at each level although these did not occur for each characteristic, or in each learning environment. There were two trends observed across the three environments, and they are presented in the following sections.

Social Media Characteristics	Learner Relationships: I-to-L	Learner Relationships: L-to-L	Learner Relationships: L-to-I
Social Interaction	**3**	**26**	
Social Interaction		**13**	**2**
Social Interaction		**29**	
Social Collaboration		**20**	
Social Collaboration		**14**	
Social Collaboration		**7**	
Content Sharing		**8**	
Content Sharing		**3**	
Content Sharing		**11**	
User Generated Content		**8**	
User Generated Content		**9**	
User Generated Content		**5**	
Social Connectedness			

Table 5-1: Total Learner Relationships Instances

The trend that can be observed across each of the microblog enabled CLEs, is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, where the majority of instances occurred at the learner-to-learner level, which is expected in a CLE. For example, *Social Interaction* enabled *Learner Relationships* when learners were discussing how to complete the task, which counted for the highest amount of instances across the three environments (see Table 5-1). This was as a result of learners discussing the task, and how they should complete it. *Learner Relationships* were also enabled by *Social Collaboration* when learners acknowledged questions that were asked, or acknowledged when learners agreed or disagreed with them (see Table 5-2).

Social Collaboration, Learner Relationships: Learner-to-Learner		
Tweet Reference: G2T34	**Learner Name:** *@ISBP107636563*	**Assessment**
#isbpgroup2 sabine, are those the theories or the approaches?		A learner asks an assigned group member a question in relation to the task *(Social Collaboration)*.
In response to @ISBP107636563		
Tweet Reference: G2T35	**Learner Name:** @ISBP111223752	**Assessment**
@ISBP107636563 more theories ? are we supposed to look approaches? well, I don't know the difference		The assigned group member acknowledges the question by responding, forming/strengthening a learner-to-learner relationship *(Learner Relationships)*.
In response to @ISBP107636563		
Tweet Reference: G2T38	**Learner Name:** @ISBP111223752	**Assessment**
@ISBP107636563 ok I know what you mean, yes they are approaches, look at slides 9 of course 09/11/11		The same assigned group member responds again, this time indicating what she was talking about.
In response to @ISBP111223752		
Tweet Reference: G2T41	**Learner Name:** *@ISBP107636563*	**Assessment**
@ISBP111223752 ok excellent. agreed. #isbpgroup2. I will take the strategic alignment theory,industrial economics,transaction cost theory,k?		The learner who asked the original questions responds, and a consensus is reached strengthening the learner-to-learner relationship *(Learner Relationships)*.

Table 5-2: An Instance of Social Collaboration Enabling Learner Relationships at the Learner-to-Learner Level

Content Sharing enabled *Learner Relationships* to be formed or strengthened across all three of the SMECLEs when learners shared some content, most often in the form of links, which other learners consumed, and acknowledged that they had, allowing information to flow between them. *User Generated Content* also enabled *Learner Relationships*, based on learners generating and sharing original content, where other learners acknowledged this content by discussing it, again allowing information to flow from one learner to another learner (see Table 5-3).

User Generated Content, Learner Relationships: Learner-to-Learner		
Tweet Reference: G6T22	**Learner Name:** @IS4428108542759	**Assessment**
#IS4428G6 so for SEO-combining our definitions.SEO directly addresses the website's need to naturally attract and retain users.		A learner creates and shares some original content *(User Generated Content)* by bringing together the definitions that they had shared.
In response to @IS4428108542759		
Tweet Reference: G6T25	**Learner Name:** @IS4428107382855	**Assessment**
@IS4428108542759 ya that should do it, forget spider		An assigned group member acknowledges this, and agrees with the definition, forming/strengthening a learner-to-learner relationship *(Learner Relationships)*.

Table 5-3: An Instance of User Generated Content Enabling Learner Relationships at the Learner-to-Learner Level

The majority of *Leaner Relationships* instances occurred at the learner-to-learner level, which is expected in a CLE (see Table 5-1). Since the role of the instructor in a CLE is reduced to providing a task, and offering guidance when required, it would be expected that little interaction would occur between the instructor, and the learners. However, there are occasions when the instructor may feel they need to guide a learner(s) based on what is happening, or if a learner(s) asks a question(s) of them. In two of the three learning environments, IS4428, and IS3101, there was no instance of an instructor-to-learner relationship being formed, while there were three such instances observed in IS6119. This could be due to the learners not having difficulty understanding the task, or as observed in IS6119, the instructor provided guidance to learners when they realised they were providing an answer to the task in an incorrect manner. However, the instructor for IS4428 did make a number of comments, trying to help the learners in the environment, but they did not get a response (see Table 5-4).

Social Interaction, Role of the Instructor: Individual Level		
Tweet Reference: I1T10	**Learner Name:** @IS4428104468261	**Assessment**
Don't forget #twitter itself is a great source for information. You can #communicate with many (even experts), by asking questions!!!		The instructor tries to provide some guidance to the class group (*Role of the Instructor)* in relation to the task, explaining where they can try get some information. As no other learner acknowledged the comment, the instance occurred at the individual level.

Table 5-4: An Instance of Social Interaction Enabling Role of the Instructor at the Individual Level

In this instance, the instructor tries to provide some advice to the learners on where they could potentially get more information to help them with the task, but no learner acknowledged the comment, and there was no observed instance of any learners heeding this advice, resulting in no *Learner Relationship* being formed. This is in contrast to IS6119, where there were three instances of this kind of relationship being created, more from the instructor offering guidance to learners, and having them acknowledging it, as opposed to learners asking questions of the instructor (see Table 5-5).

<table>
<tr><th colspan="3">Social Interaction, Role of the Instructor: Instructor-to-Learner</th></tr>
<tr><td>Tweet Reference:
G3T31</td><td>Learner Name:
@ISBP103464679</td><td>Assessment</td></tr>
<tr><td colspan="2">#group3 definitions will be emailed to u!</td><td>A learner makes a comment (Social Interaction) in relation to the task, about sending their answers via an email.</td></tr>
<tr><td colspan="3">In response to @ISBP103464679</td></tr>
<tr><td>Tweet Reference:
I1T6</td><td>Learner Name:
@ISBP93260857</td><td>Assessment</td></tr>
<tr><td colspan="2">@isbp103464679 will you pop them on twitter</td><td>The instructor acknowledges this by making a comment (Social Interaction), guiding the learner by telling them to put their answers on Twitter (Role of the Instructor).</td></tr>
</table>

Table 5-5: An Instance of Social Interaction Enabling Learner Relationships at the Instructor-to-Learner Level

In this instance, an instructor-to-learner relationship was created, as the instructor helps guide a learner in relation to the task. Without this advice, the learner would have emailed their answers to the instructor, potentially costing class group members the opportunity to access their answers. When the instructor advised them to put their answers on Twitter, they acknowledged this by doing as was instructed. There is also the potential for learner-to-instructor relationships, but from the three environments, there were only two instances of these, both in IS3101, where learners asked questions of the instructor, and the instructor responded. This resulted in learner-to-instructor relationships being formed. The next section explains the cell based trend that was observed.

5.2.3 Cell Based Trend: "Content Sharing, Active Learning" was an Individual Experience

Across all three of the environments, *"Content Sharing, Active Learning"* had the highest count of instances, as shown in Figure 5-1. This could be due to microblog's ability to allow content to be easily shared amongst its users, achieved by sharing links to different types of content such as videos, PDFs, websites, and images, or by sharing text based content, all of which were observed across the three environments.

The first trend across this cell for each of the SMECLEs is that while learners did share content, it was mainly only beneficial to the individual who consumed and shared it, as other learners rarely acknowledged it (see Table 5-6). Further to this however, is that in two of the SMECLEs, IS6119 and IS4428, there were instances at three levels: individual, assigned group, and class group, while for IS3101 they occurred at two levels: individual, and assigned group.

		Active Learning			
		I	**AG**	**CG**	**DCG**
Content Sharing	IS6119	**124**	**6**		
	IS3101	**24**	**2**		
	IS4428	**105**	**6**	**2**	
	Total	**253**	**14**	**2**	

Table 5-6: Cross Case Comparison of *"Content Sharing, Active Learning"* Instances

While *"Content Sharing, Active Learning"* was the highest occurring instance across all three environments (see Figure 5-1), a noticeable trend was that the vast majority of these instances occurred at the individual level. For example, 95% of instances in IS6119 occurred at the individual level, 92% of instances in IS3101 occurred at the individual level, and 93% of instances in IS4428 occurred at the individual level, resulting in a total of 94% of instances occurring at the individual level, in comparison to the next closest, 5% at the assigned group level. This indicates that learners sharing content was prevalent throughout all the SMECLEs, despite the task that was set, but very few learners were acknowledging what others were sharing. One possible explanation for this is that for the assigned groups who took the cooperative approach to answering the task, individuals were too busy concentrating on their own part of the task to be able to view content that others were sharing, and to even acknowledge it.

Another possible explanation is that there was a case of information overload, as tweets were appearing at too quick a rate for learners to process them, and acknowledge the content that was shared. This occurs due to the network that is created where every learner is connected to every other learner in the collaborative learning environment, where, when a learner sends a tweet, it appears on every other learner's timeline. That means, if five learners send a tweet at the same time, these five tweets appear on every other learner's timeline, pushing the previous tweets down, sometimes making it difficult to process. For IS6119 and IS4428, where there were 31 and 28 learners, respectively, this proved to be an issue, as there was the potential of a large amount of tweets being sent every minute, and this proved to be the case (see Table 5-7).

Tweet Reference: G4T21	**Learner Name:**	**Assessment**
@ISBP111223571 @ISBP107480661 What was that? Stuff is happening too fast i cant keep track.		A learner is communicating with their group members, indicating that information is flowing too fast for them to be able to keep up.

Table 5-7: A learner indicates things are happening too fast for them to keep up

In this instance, a learner is complaining, to their assigned group members, about information appearing too fast. This was due to too many other learners in the environment sending tweets also, and clogging up their timeline, causing them to lose focus on the tweet they were looking at. Interestingly however, this appears to be an issue that was consigned to the larger classes, as IS3101 appeared to have little issue with information overload. This is perhaps due to fewer tweets being sent, allowing information to be read, processed, and understood easier, without the disruption of more tweets being added on top of them. While Figure 5-1 indicates that there were only two instances from twenty-six where a learner responded to some content being shared, one of the learners of the microblog enabled CLE stated *"good environment in which to share information and also be able to discuss the info being shared promptly. – easy to gather info. from people who may have other point of view."* This indicates that they were benefiting from content that was being shared from other learners, but perhaps they did not feel the need to respond to it, as the majority of it was URLs to different websites, and they instead responded to the content that was generated by learners, as well as answer questions that were asked.

The second trend across this cell for each of the SMECLEs is that the majority of the type of content being shared consisted of text, where learners provided information on the topics they were discussing, either from a source, or else providing information that was already known on the topic in the community (see Table 5-8).

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G1T25	**Learner Name:** @ISBP111222288	**Assessment**
#g1 Multisourcing ... services from the optimal set of internal and external providers in the pursuit of business goals http://en.wikipedia.org/wiki/Multisourcing …		A learner shares some content in the form of text *(Content Sharing)*, and provides a source for where it came from in the form of a link. As no other learner acknowledged the content, the instance occurred at the individual level.

Table 5-8: An Instance of Content Sharing Enabling Active Learning at the Individual Level

The third trend across this cell for each of the SMECLEs was that when learners shared content, they often failed to explain why. In these SMECLEs, it is understood that if a learner shares some content, they need to explain why, showing they have processed it and can apply it, in order to enable *Active Learning*; otherwise learners could be sharing content without having consumed it. This proved not to be so prevalent, as in all three of the environments, numerous learners shared content, but gave no explanation as to why. This is potentially down to the limit of 140 characters per tweet, as numerous learners indicated the limit of 140 characters prevented them from being able to do much, but some learners shared content, and explained why it is relevant to the task in their next tweet. The cross comparison of the three blog enabled CLEs is presented in the next section.

5.3 Cross Comparison of Blog Enabled Collaborative Learning Environments

With the three blog enabled CLEs evaluated using the SMECLE evaluation framework (see Appendix B), a cross comparison is presented in Figure 5-2. A number of trends are highlighted, and some of these are introduced next, again under the headings of *task based trends*, *characteristic based trends*, and *cell based trends*.

				Task																	
				Collaborative Learning Characteristics																	
				Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
				I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Blog	Social Media Characteristics	Social Interaction	IS2200	235	13	56			1		3	11			3		1		9	64	2
			IS6118	57	5	25	2		3						1		2			28	
			IS1100	125	5	37			1						1					45	
		Social Collaboration	IS2200	56	17	52		3	10		1								1	67	
			IS6118	99	13	113	1	1	38											120	
			IS1100	53		46			13											48	
		Content Sharing	IS2200	846	73	294		25	64	1										377	
			IS6118	422	62	206	1		14											189	
			IS1100	141	37	192			1											251	
		User Generated Content	IS2200	64	7	27					3		4		1					14	
			IS6118	110	21	100	1		3						1	1	2			87	
			IS1100	75	6	51			6				4		2		2			50	
		Social Connectedness	IS2200																		
			IS6118																		
			IS1100																		

I = Individual
AG = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale:	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%

Figure 5-2: Cross Case Comparison of Blog Enabled Collaborative Learning Environments

5.3.1 Task Based Trend:

All three of the SMECLE environments had the same task to complete, where assigned groups were given topics that each learner had to blog about each week, with the only difference being the topics that were assigned. Also, IS1100 were given seven weeks to complete their task, as opposed to the six weeks that IS2200 and IS6118 were given. There were a few approaches to solving the task observed across the three environments. For example in IS2200, the majority of assigned groups took the same approach, where learners wrote blog posts on their topic, from different perspectives, without any consultation with their assigned group members, and then commented on other learners blog posts. This is a trend that was seen in the other two environments also, where in IS1100, the majority of blogs were also written in this manner, and the same can be said for IS6118. This would not be considered a very collaborative approach to completing the task, but it must be noted that while in IS2200 it resulted in some assigned group members creating very similar blog posts, in general, because learners were taking their own perspectives on the topics that were assigned, often blog posts did not have much cross over. However, a more collaborative approach to completing the task was also observed in all three of the environments, where learners built on the blog posts of their assigned group members, clearly stating it at the start, and on other occasions, class group members built on the blog posts of other learners too.

The styles of blog posts were also very similar across the three environments, where learners often shared content in the form of text when making writing about a particular topic. This was sometimes aided with images, or videos, but rarely consisted of learners providing an opinion. A trend that started to appear in IS6118 was of learners asking a question towards the end of their posts, trying to encourage some interactions, which often worked – this was not observed in either of the other two SMECLEs. Instead, for IS2200 learners were much more concerned with sharing content, which encouraged a lot of interactions from class group learners, while IS1100 were quite open to providing their opinion, although this was usually in the comments section, as opposed to in their actual blog posts.

In the end, the majority of learners participated by writing blog posts each week, and commenting on other learners blogs, which is evident by the amount of blog posts and blog comments that were made across the three SMECLEs. This resulted in the task being completed, as each environment created a knowledge repository, where learners could return to for their exams when they were looking for some information on a particular topic. For example, learners could go to the address of their blog environment, click on the *"Role of a Systems Analyst"* category, and they would be presented with all the blog posts that were categorised under that, providing them with many different perspectives.

5.3.2 Characteristic Based Trend: Group Participation

Group Participation occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. This can be enabled by any of the social media characteristics, from discussing the task, and getting a response from a group member, which gets a further response (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, and getting a response from a group member, which gets a further response (*Social Collaboration*), sharing some content, and having it acknowledged, which gets a further response (*Content Sharing*), and generating some content, sharing it, having it acknowledged, which gets a further response (*User Generated Content*). Depending on who acknowledges it, *Group Participation* can be enabled at different levels: assigned group; class group; and/or discipline community group.

As shown in Table 5-9, four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Group Participation* across each of the three SMECLEs, except for IS2200, where there were no instances of *User Generated Content* enabling *Group Participation*. It was also observed that there was at least one instance at each level: assigned group, class group, and discipline community group, although these did not occur for each characteristic, or in each learning environment. There were two trends observed across the three environments, and they are presented in the following sections.

		Group Participation		
		AG	CG	DCG
Social Media Characteristics	Social Interaction		1	
			3	
			1	
	Social Collaboration	3	10	
		1	38	
			13	
	Content Sharing	25	64	1
			14	
			1	
	User Generated Content			
			3	
			6	
	Social Connectedness			

Table 5-9: Total Group Participation Instances

The first trend that can be observed across each of the blog enabled collaborative learning environments, is that four of the social media characteristics (*Social Interaction*, *Social Collaboration*, *Content Sharing*, *and User Generated Content*) *Group Participation* in two of the SMECLEs, namely IS6118, and IS1100, with three of the four social media characteristics enabling *Group Participation* in IS2200, with instances at all levels: assigned group, class group, and discipline community group (see Table 5-9). For example, on five occasions, *Social Interaction* enabled *Group Participation* across all three of the environments when a learner mentioned how they liked an example that was provided in a blog post, discussed the topic that was in the blog post, and a learner made a suggestion on how they could improve a blog post – each of these were acknowledged when another learner responded to them, which got a further acknowledgement when another learner responded, reaching a consensus.

Group Participation was also enabled by *Social Collaboration*, with a total of sixty-one instances being observed, which mainly came in the form of learners asking questions, which got acknowledged by other learners responding to them, which got a further acknowledgement, where a consensus was reached. Further to learners asking questions, it was also observed in two of the SMECLEs, IS6118, and IS1100, that learners were agreeing, and disagreeing with each other, which led to some discussion, before a consensus was reached – there was no instance of this occurring in IS2200. Often these discussions that were started by learners asking questions, or agreeing/disagreeing with each other, only resulted in the minimum required to satisfy the rule, where discussions only lasted for three interactions, and mainly consisted of a learner asking a question about a blog post, a response from the learner who wrote the blog post, and a further response from the learner who asked the question. However, there were also instances where a question, or an agreement/disagreement, got other learners involved in the discussion, which would last more than three interactions (see Table 5-10).

Social Collaboration, Group Participation: Class Group Level		
Blog Reference: G8B6	**Learner Name:** ismisetusa	**Assessment**
even tho Microsoft may have the most advanced product do you believe, in your own personal opinion, that more advanced tech can out compete the house hold 'brand name' of apple alone?		A learner asks a question of a class group member *(Social Collaboration)* in relation to a blog post they wrote.
In response to ismisetusa		
Blog Reference: G8B6	**Learner Name:** davidoppermann	**Assessment**
To answer your question, Microsoft has been a brand name long before Apple was ever introduced into the market. Microsoft OS and Microsoft software has been a worldwide leader in enterprise and still is today since Microsoft stock first went public in 1986. Apple has had it's ups and downs and only really became a household 'brand name' during the 2007-2011 period where it gained worldwide success. Play on the word 'household', majority of users buy Apple products only for personal use and rarely do you see people using OS X (Apples OS) used in business. Yes the new I-pad looks sleek and stylish, but with the introduction of the windows slate, I think windows could be more efficient and reliable when it comes to business rather than an I pad or alternative pads which provides less functionality for your business needs.		The class group member acknowledges the question, providing an answer *(Group Participation).*
In response to davidoppermann		
Blog Reference: G8B6	**Learner Name:** returnofthemc	**Assessment**
I personally feel that Microsoft will soon realise that they are too late to have any say in the tablet market. They were happily working away on MS surface for the last eight years, initially they thought they could use the technology for interactive surfaces e.g. at a restaurant you could use your table (surface) to order.		This question is further acknowledged by another class group member, who also gives their opinion *(Group Participation).*

<table>
<tr><td colspan="2">However in the mean time the world has been engulfed by the brand and marketing explosion of Apple and in this case of its iPad. Nobody thought the tablet would sell well, Jobs thought differently and since its release in 2010 it has sold over 100 million units.

Today people who want a tablet have already bought an iPad or a cheaper alternative e.g. Kindle, Playbook etc. I feel that yes there is probably some money to be made by Microsoft in corporate tablet sales, some kind of office, slate bundle. However I believe that if somebody wanted a tablet then they would have already bought it.</td><td></td></tr>
<tr><td colspan="3">In response to returnofthemc</td></tr>
<tr><td>Blog Reference:
G8B6</td><td>Learner Name:
pm1083</td><td>Assessment</td></tr>
<tr><td colspan="2">Have to disagree with returnofthemc here.

Microsoft are behind in entering the tablet market but I don’t think this necessarily means that they will not have success within it. A few years ago Apple had a stranglehold on the Smartphone market with their Iphone. However Samsung now have the highest selling smartphone in the US market with their Galaxy 3. http://news.sky.com/story/1008905/samsung-upsets-the-apple-cart-with-the-s-iii

As Dave pointed out Microsoft is just as big a a brand name as Apple in the technology sector and I see this carrying over to and having a big effect on their tablet sales.

I don’t see a reason why Microsoft can’t capture a sizeable share of the tablet market from apple in the future.</td><td>Another class group member responds to this opinion, where they disagree with what they said, and explain why (Group Participation). As this participation was between class group members, this instance occurred at the class group level.</td></tr>
</table>

Table 5-10: An Instance of Social Collaboration Enabling Group Participation at the Class Group Level

There were also nine instances where *Group Participation* was enabled by *User Generated Content* across two of the SMECLEs, IS6118, and IS1100 (see Table

5-9). This original content was always in the form of text, with learners giving their opinion, which got an acknowledgement from a learner, which got a further acknowledgment from another learner. There was no instance of this in IS2200, where learners did often give their opinion, but it did not enable a discussion to occur, as often other learners did not acknowledge it.

Further, *Group Participation* was enabled by *Content Sharing* across all of the SMECLES, when learners shared content, most often in the form of text, which got acknowledged by another learner, which got further acknowledged by another learner. While there was only a single instance of this in IS1100, there were ninety observed instances in IS2200, where learners mainly shared content in the form of text, which got discussions going between other learners – it was also observed that sharing of links to articles, and videos, also enabled *Group Participation* in this environment, as was the same for IS6118, where there were fourteen instances. The reason why there was such a high amount of instances in IS2200 was learners shared a lot of content in their blog posts, mainly in the form of text, which often got acknowledged by other learners, which in turn got acknowledged by the learner who wrote the blog. These instances often spanned three interactions, although there were also occasions where longer discussions occurred (see Table 5-11).

Content Sharing, Group Participation: Class Group Level		
Blog Reference: G45B9	**Learner Name:** sad112759089	**Assessment**
In 2010 a survey by the International Telecommunication Union stated that Ireland had 68.9% of the population subscribing to the Internet. As of the end of 2012 that has gone up to 76.8%. On average an Irish individual would spends 3-5 hours a day on the internet.		A learner shares some content in the form of text from an article *(Content Sharing)*, and also a link to an image that shows some statistics.
In response to sad112759089		
Blog Reference: G45B9	**Learner Name:** sad112712305	**Assessment**
That is very interesting ! I think that email will always be first when it comes to surfing on the Internet.		A class group member acknowledges the shared content, and provides their opinion on one of the figures that were shared *(Group Participation)*.
In response to sad112712305		
Blog Reference: G45B9	**Learner Name:** sad112759089	**Assessment**
I was thinking the same, also I thought people would spend more than 13% of their time on multi-media sites such as youtube,watching t.v shows/movies online.		The learner who wrote the blog post acknowledges this by responding, agreeing with what was said, and offering their opinion also, and a consensus is reached *(Group Participation)*. As this participation was between class group members, this instance occurred at the class group level.

Table 5-11: An Instance of Content Sharing Enabling Group Participation at the Class Group Level

The second trend that was observed across the three SMECLEs was that the majority of instances occurred at the class group level for all of the characteristics (see Table 5-9). That is to say, when learners were discussing something in relation to the task, asking questions of each other, sharing content, or generating and sharing original content, which resulted in discussions occurring, they were more likely to involve class group members, as opposed to assigned group members. For example, the IS1100 SMECLE did not have a single assigned group or discipline community group instance of a social media characteristic enabling *Group Participation*, a trend that was almost replicated in the IS6118 SMECLE, where there was only a single assigned group instance, with the rest occurring at the class group level. This was slightly different for IS2200, where the majority of instances did occur at the class group level, but there were also twenty-eight assigned group instances, and a single discipline community group instance. This trend is probably as a result of the freedom learners have to read any blog they wish, which could attract them to any learner's blog posts, and make comments as they wished.

5.3.3 Cell Based Trend: "Social Collaboration, Active Learning" was a Class Group Experience

Across all three of the environments, *Active Learning* was enabled by *Social Collaboration*, most often when learners asked questions of other learners, but also when they agreed with other learners and explained why, and sometimes when they disagreed with other learners and explained why (see Table 5-12). The first trend across this cell however, is that when learners did ask questions, or agree/disagree with another learner, they were more likely to get a response from another learner than they were not to. For example, in the IS2200 SMECLE, assigned group and class group instances account for 56% of the instances, while in the IS6118 assigned group, class group, and discipline community group instances account for 57% of instances. Only in the IS1100 SMECLE, are individual instances higher than the other three combined, but there is only a difference of 8%. What this indicates across the three environments is that *Active Learning* was not just an individual experience when participating in the SMECLEs, but it was more of a group experience, where learners were asking questions, agreeing with each other, and on some occasions disagreeing with each other, and getting responses to these interactions.

		Active Learning			
		I	AG	CG	DCG
Social Collaboration	IS2200	**56**	**17**	**52**	
	IS6118	**99**	**13**	**113**	**1**
	IS1100	**53**		**46**	
	Total	**208**	**30**	**211**	**1**

Table 5-12: Cross Case Comparison of *"Social Collaboration, Active Learning"* Instances

The second trend of the *"Social Collaboration, Active Learning"* cell across the three SMECLEs, is that when learners were asking questions, or agreeing/disagreeing with other learners, they were mostly class group instances as opposed to assigned group instances. That is to say, learners who asked questions, or agreed with other learners, were mainly class group members as opposed to assigned group, or discipline community group members, as evidenced in Table 5-12. The summary of this chapter is presented in the next section.

5.4 Summary

The question addressed in this chapter was w*hat are the relationship trends between social media characteristics and collaborative learning characteristics in enabling collaborative learning?* In addressing this question, three microblog enabled CLEs, and three blog enabled CLEs, were analysed with the SMECLE evaluation framework, and a cross comparison of each was presented. This consisted of three types of trends that were evident: *task based trends*, *characteristic based trends*, and *cell based trends*, and from these, the key trends were identified and explained. The contributions of this research is presented in the next chapter, where the contributions to both the knowledge base, and to practice are explained.

Chapter 6 Conclusion: Research Contributions

6.1 Introduction

The purpose of this chapter is to present the contributions of the study. The primary contribution is the evaluation framework for social media enabled collaborative learning environments (SMECLEs). This contribution is presented using three of the four DSR artefacts, namely model, method, and instantiation, as per Hevner et al. (2004). The *"Active Learning"* characteristic of collaborative learning is used as an exemplar to represent the instantiations, but the trends for all the other characteristics for collaborative learning are also presented. The secondary contribution of this research is the IS DSR process model. This process model, developed in Chapter 2, provided the structure for the execution of this DSR study. The reflections of the researcher are further provided in this chapter to enrich this IS DSR process model. This chapter also provides a description of how to use the SMECLE evaluation framework. Finally, the chapter concludes with the limitations of the study, and recommendations for future work.

6.2 SMECLE Evaluation Framework

The primary contribution of this research, to both the knowledge base and to practice, is the SMECLE evaluation framework. However, like other research that has developed frameworks from DSR (McNaughton et al., 2010; Abbasi et al., 2012; Hustad and Olsen, 2014), it is not possible to fit such a framework into one of the four DSR contributions suggested by Hevner et al. (2004), namely: constructs, models, methods, and/or instantiations. Instead, it is evident that such a framework is made up of each of these elements: the constructs are the characteristics of social media, and collaborative learning; the model is the representation of the social media characteristics juxtaposed against the characteristics of collaborative learning; the methods are the rules that explain how the social media characteristics enable the collaborative learning characteristics; and the instantiation is when the evaluation framework is used to evaluate SMECLEs, where trends can be observed.

Three of the four of these are thus considered DSR contributions from this study: the model, the methods, and the six instantiations. These are presented in the form of prescriptive knowledge, which Gregor and Hevner (2013, p.A3) defines as *"Prescriptive knowledge concerns artifacts designed by humans to improve the natural world"*, and there are five types: constructs, models, methods, instantiations, and design theories. While some may question whether prescriptive knowledge created from DSR creates valid knowledge due to a lack of truth value, Sonnenberg and vom Brocke (2012) argues that prescriptive knowledge that emerges through a DSR process does have a truth-like value. This results in incremental additions being made to the prescriptive knowledge base throughout a DSR process, but it must be evaluated and documented in a rigorous way (Sonnenberg and vom Brocke, 2012). Therefore presented in the following sections is an explanation of each of these DSR contributions, beginning with the model.

6.2.1 Model

Previously there was a lack of understanding in the knowledge base as to whether social media enabled collaborative learning. To improve this understanding, this research organised the constructs that were identified in the literature review, namely the characteristics of social media, and the characteristics of collaborative learning, into a model. This model provides a structure expressing relationships that exist between these constructs, in a SMECLE, which is presented in Figure 6-1. The model was developed over six design cycles, where it was refined based on evidence from data in six SMECLEs, until no further improvements were being identified. The following prescriptive design knowledge was created: relationships exist between four of the characteristics of social media: *Social Interaction*, *Social Collaboration*, *Content Sharing*, and *User Generated Content*, and the five characteristics of collaborative learning, and these can occur at different levels depending on the relationship being discussed, as is evident in Figure 6-1. For example, *Social Interaction* can enable *Active Learning* at four different levels: individual level, assigned group level, class group level, or discipline community group level, while *Social Interaction* can also enable *Group Participation* at three levels: assigned group level, class group level, or discipline community group level. However, while the model suggests that there is also a relationship between the social media characteristics of *Social Collaboration*, and *Content Sharing*, with the collaborative learning characteristics of *Role of the Instructor*, and *Learner Diversity*, there was no evidence to confirm this. Further, there was also no evidence to confirm the relationships between the fifth social media characteristic, *Social Connectedness*, and the five characteristics of collaborative learning.

This prescriptive design knowledge thus satisfies the criteria for nascent theory by providing a model that increases our understanding of the relationships that exist between the characteristics of social media and the characteristics of collaborative learning in a SMECLE. While some may question whether prescriptive knowledge created from DSR creates valid knowledge due to a lack of truth value, Sonnenberg and vom Brocke (2012) argues that prescriptive knowledge that emerges through a DSR process does have a truth-like value. In this instance, this model was evaluated across six design cycles, with six different cases, and each evaluation phase was well documented, thus the prescriptive knowledge created here has a truth-like value. Therefore, this is a contribution to the knowledge base at Level 2 of the Gregor and Hevner (2013) DSR contribution types. The next DSR contribution of this research, namely the cell rules for the SMECLE evaluation framework, is now introduced.

			Task																		
			Collaborative Learning Characteristics																		
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Social Media Platform	Social Media Characteristics	Social Interaction																		
		Social Collaboration																		
		Content Sharing																		
		User Generated Content																		
		Social Connectedness																		

I = Individual
AG = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Figure 6-1: SMECLE Evaluation Framework

6.2.2 Methods: Cell Rules for the SMECLE Evaluation Framework

While the model, as in Figure 6-1, provides a structure between the constructs, what are missing are the rules that explain how the social media characteristics enable the characteristics of collaborative learning in a SMECLE. Such prescriptive knowledge does not exist in the knowledge base, and therefore needed to be created. To achieve this, base rules were originally created for all twenty-five cells in the evaluation framework by understanding each social media characteristic, and how they may enable any of the collaborative learning characteristics. Then, over the six design cycles, sixteen of these base rules evolved, until no further improvements were identified.

This evolution of the rules can be seen in Table 6-1, which explicitly shows how each rule evolved through the six design cycles. The ● represents when a rule needed to be amended due to data indicating it was ineffective at determining when a social media characteristic enabled a collaborative learning characteristic; the ○ represents a rule change that occurred retrospectively, where it was deemed that new knowledge that was created from an empirical rule change also needed to be incorporated into rules that had not needed to be amended; lastly, a blank square represents when a rule was effective at determining when a social media characteristic enabled a collaborative learning characteristic. For example, the rule for when *Social Interaction* enables *Active Learning* in a SMECLE, as shown in Table 6-1, was shown to be ineffective in Phase 1 as represented by the ●. The rule was thus amended in Phase 2, where it was then shown to be effective in that phases evaluation, represented by the blank square. The learning from this amendment was then used to retrospectively update all the other rules in Phase 2 that are represented by the ○, as the new knowledge was deemed important to all these cells. By phase 6, each of these sixteen rules had gone through at least one empirical rule change, and many had also gone through at least one retrospective rule change, and were shown to be effective at explaining when the characteristics of social media enabled the characteristics of collaborative learning.

		Design Cycles					
		Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
Active Learning	Social Interaction, Active Learning	●		●			
	Social Collaboration, Active Learning		○	●			
	Content Sharing, Active Learning	●	●	●			
	User Generated Content, Active Learning		○●	●			
Group Participation	Social Interaction, Group Participation		○	●			
	Social Collaboration Group Participation		○	●			
	Content Sharing, Group Participation		○		○●		
	User Generated Content, Group Participation		○		○●		
Role of the Instructor	Social Interaction, Role of the Instructor	●				●	
	User Generated Content, Role of the Instructor		○			●	
Learner Diversity	Social Interaction, Learner Diversity		○		●		
	User Generated Content, Learner Diversity		○		●		
Learner Relationships	Social Interaction, Learner Relationships		○			●	
	Social Collaboration, Learner Relationships		○			●	
	Content Sharing, Learner Relationships		○			●	
	User Generated Content, Learner Relationships		○			●	

● = Empirical Rule Change
○ = Retrospective Rule Change

Table 6-1: Evolution of the SMECLE Evaluation Framework Rules

Presented in the following tables (Table 6-2, Table 6-3, Table 6-4, Table 6-5, and Table 6-6) are the completed rules for each of the sixteen cells from Table 6-1.

	Active Learning			
	I	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, but no group member acknowledges it.	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.
Social Collaboration	A learner asks a group member(s) a question(s) in relation to the task, but no group member acknowledges it. or A learner agrees/disagrees with a group member(s) in relation to the task, and explains why, but no group member acknowledges it.	A learner asks an assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it. or A learner agrees/disagrees with an assigned group member(s) in relation to the task, and explains why, and at least one assigned group member acknowledges it.	A learner asks a class group member(s) a question(s) in relation to the task, and at least one class group member acknowledges it. or A learner agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it.	A learner asks a discipline community group member(s) a question(s) in relation to the task, and at least one discipline community group member acknowledges it. or A learner agrees/disagrees with a discipline community group member(s) in relation to the task, and explains why, and at least one discipline community group member acknowledges it.
Content Sharing	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it.
User Generated Content	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges, it showing their understanding of it.	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table 6-2: Active Learning Cell Rules

	Group Participation		
	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member.	A learner makes a comment in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member.	A learner makes a comment in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member.
Social Collaboration	An assigned group member asks another assigned group member(s) a question(s) in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by at least one assigned group member, and a consensual answer is reached. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why and at least one assigned group member acknowledges it, which is further acknowledged by a least one assigned group member, and a consensual answer is reached.	A class group member asks another class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by at least one class group member, and a consensual answer is reached. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by a least one class group member, and a consensual answer is reached.	A discipline community member asks a class group member(s) a question(s) in relation to the task and at least one class group member acknowledges it, which is further acknowledged by a least one class or discipline community group member, and a consensual answer is reached. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why, and at least one class group member acknowledges it, which is further acknowledged by at least one class or discipline community group member, and a consensual answer is reached.
Content Sharing	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.
User Generated Content	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, which is further acknowledged by a least one other assigned group member, and a consensual answer is reached.	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, which is further acknowledged by a least one other class group member, and a consensual answer is reached.	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, which is further acknowledged by a least one other class/discipline community group member, and a consensual answer is reached.

Table 6-3: Group Participation Cell Rules

	Role of the Instructor			
	I	AG	CG	DCG
Social Interaction	The instructor makes a comment in relation to the task, but no group member acknowledges it.	The instructor makes a comment to an assigned group in relation to the task, and at least one assigned group member acknowledges it.	The instructor makes a comment to the class group in relation to the task, and at least one class group member acknowledges it.	The instructor makes a comment to the discipline community group in relation to the task, and at least one discipline community member acknowledges it.
User Generated Content	The instructor creates, and shares some original content in relation to the task, but no group member acknowledges it.	The instructor creates, and shares some original content in relation to the task to an assigned group, and at least one assigned group member acknowledges it, showing their understanding of it.	The instructor creates, and shares some original content in relation to the task to the class group, and at least one class group member acknowledges it, showing their understanding of it.	The instructor creates, and shares some original content in relation to the task to the discipline community group, and at least one discipline community member acknowledges it, showing their understanding of it.

Table 6-4: Role of the Instructor Cell Rules

	Learner Diversity			
	I	AG	CG	DCG
Social Interaction	A learner makes a comment in relation to the task, drawing on their background, but no group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one class group member acknowledges it.	A learner makes a comment in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.
User Generated Content	A learner creates, and shares some original content in relation to the task, drawing on their background, but no group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one assigned group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one class group member acknowledges it.	A learner creates, and shares some original content in relation to the task, drawing on their background, and at least one discipline community member acknowledges it.

Table 6-5: Learner Diversity Cell Rules

	Learner Relationships		
	I-to-L	L-to-L	L-to-I
Social Interaction	A relationship is formed, or strengthened, when an instructor makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner makes a comment in relation to the task, and an instructor acknowledges it.
Social Collaboration	A relationship is formed, or strengthened, when an instructor asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when an instructor agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner asks a learner(s) a question(s) in relation to the task, and at least one assigned, class, and an instructor acknowledges it. or A relationship is formed, or strengthened, when a learner agrees/disagrees with another learner(s) in relation to the task, explaining why, and an instructor acknowledges it.
Content Sharing	A relationship is formed, or strengthened, when an instructor shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and an instructor acknowledges it.
User Generated Content	A relationship is formed, or strengthened, when an instructor creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.	A relationship is formed, or strengthened, when a learner creates and shares some original content in relation to the task, and an instructor acknowledges it.

Table 6-6: Learner Relationship Cell Rules

With this new prescriptive design knowledge, it is now not only evident that sixteen social media characteristics can enable collaborative learning characteristics in a SMECLE (as represented by the model in Figure 1-6), but it is also understood how they do so. While some may question whether prescriptive knowledge created from

DSR creates valid knowledge due to a lack of truth value, Sonnenberg and vom Brocke (2012) argues that prescriptive knowledge that emerges through a DSR process does have a truth-like value. In this instance, these methods were evaluated across six design cycles, with six different cases, and each evaluation phase was well documented, thus the prescriptive knowledge created here has a truth-like value. This prescriptive design knowledge thus satisfies the criteria for nascent theory by providing these rules, and is a contribution to the knowledge base at Level 2 of Gregor and Hevner (2013) DSR contribution types. The model, and these rules, was instantiated a number of times across 6 SMECLEs, where a number of trends were identified, and these are introduced next.

6.3 Instantiation of the SMECLE Framework

Kane and Fichman (2009) made a call for IS educators, who are often IS researchers also, to start adopting social media platforms in the classroom to teach students in order to remain relevant in a world being changed by information technology. While they state it might take some trial and error on behalf of faculty to develop effective teaching processes for using these platforms, this research has established relevant knowledge that can be leveraged by educators if they wished to adopt these platforms, helping to reduce this trial and error. It is only through the adoption of the SMECLEs by such experts, that they can be further analysed and improved upon, and in a variety of case situations also, such as different modules, number of learners, and different tasks. Throughout the following sections a guide is provided that can be applied by other educators when they wish to run, and evaluate, their own SMECLEs, while in addition generating knowledge that can be used in these SMECLEs. The first step is identifying the reason(s) to implement a SMECLE, which is presented next.

6.3.1 Identifying the reason(s) to implement a SMECLE

While there are calls for social media to be introduced to learning environments, introducing it is not such a simple task, and should not be done just for the sake of it (Kane and Fichman, 2009). Educators need to consider if implementing such technology into their learning environments is beneficial for the learners. In terms of this research, as an educator, it was understood that by implementing social media in the current traditional approach to learning, little benefit would be gained by the learners. This is in agreement with Leidner and Jarvenpaa (1995) who suggest that by doing so, it may only end up speeding up ineffective processes and methods of teaching. Instead, it was understood that changing from a traditional approach to a collaborative one, which actively engages learners in the learning process, would generate more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners. Therefore, creating collaborative learning environments through social media platforms was not done for the sake of it, but looked to create more actively engaged learners. The next step was to create and run a SMECLE, which involved tasks such as deciding what social media platform(s) to use, and how it could be applied to create a collaborative learning environment.

6.3.2 Creating and Running a SMECLE

Initially, two types of social media platforms were identified as being suitable for possibly enabling collaborative learning: microblogs, and social networking sites. Microblogs, and the service of Twitter, were deemed suitable because they allow learners to connect, and interact with each other, making it possible to create groups that could work together towards solving a task. Social networking sites, and the service of Facebook, were also deemed suitable because again it allowed learners to connect, and interact with each other, but also had some tools such as word processors, and file sharing, that learners could use when trying to solve a task. However, when the instructor tried to set up the collaborative learning environment with Facebook and 179 learners, the service started closing down learner’s accounts as they were trying to connect with too many people too quickly. The service had deemed these accounts to be bots, and not humans, imposing a ban of 30 days on such accounts. As such, another social media platform, namely blogs, and the service of WordPress, were deemed suitable, as they allow learners to interact with each other, and it is possible to create groups that can work together towards solving a task. These also provided an interesting contrast with each other in terms of what could be achieved to create a collaborative learning environment. Two types of SMECLEs were thus created, and followed the design principles (DPs) on how to create them in Table 4-8.

Step	Explanation
1.	The Instructor chooses a social media platform to use.
2.	The instructor creates the rules that the learners should work within.
3.	The instructor sets up their SMP account.
4.	The instructor creates the groups of 3-4 members and this list should be provided to the learners.
5.	The instructor creates the task that must be completed – this will be dictated by how long they wish the class to go on for, where the more time they assign, the more challenging the task.
6.	The learners create accounts for the SMP being used.
7.	Learners connect their accounts with other learners if necessary

Table 6-7: Steps for Creating a SMECLE

Once the instructor and the learners had created their accounts, the class was run for the decided upon period of time, which allowed data to be created from the interactions in the learning environments. This data was then used to evaluate the effectiveness of the collaborative learning by evaluating it with the SMECLE evaluation framework, which is introduced next.

6.3.3 Evaluating a SMECLE for its effectiveness

Previously, no such tool existed for educators to be able to evaluate if their SMECLEs are effective at enabling collaborative learning. However, with the development of the SMECLE evaluation framework, it is now possible to do so. The framework provides educators with the specific mechanisms by which a social media characteristic enables a collaborative learning characteristic. From this analysis trends can be identified, which provides educators with knowledge on where their SMECLEs were effective, and where they can be improved upon. For example, for the first microblog enabled CLE, IS6119, the data that was generated was gathered, and analysed by reading through it, and any time a piece of data complied with one of the rules from section 6.2.2, it was marked into that section of the evaluation framework as a 1 to denote an instance. This created the picture for the educator of how effective collaborative learning was in their SMECLE. This process was completed for all six of SMECLEs by the educator in this research, and a cross comparison of the results can be seen in Figure 6-2.

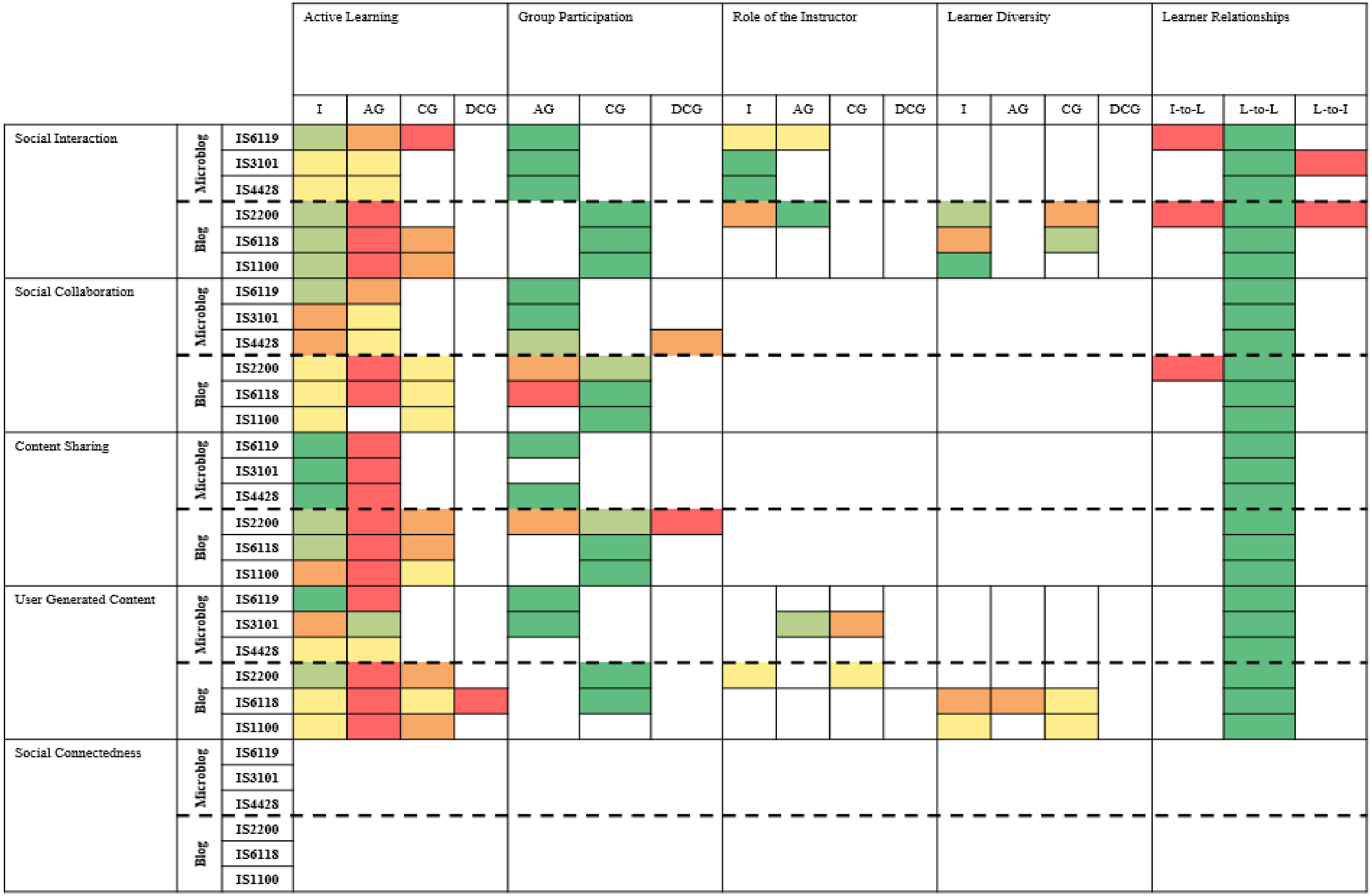

Figure 6-2: Cross Case Comparison of Microblog and Blog enabled Collaborative Learning Environments

A number of trends were also observed by analysing the completed SMECLE evaluation framework from each class, and these are presented next.

6.3.4 Trends that were observed across the SMECLEs

After completing the evaluation of the six SMECLEs with the evaluation framework, as an educator, each completed evaluation framework were compared and contrasted to identify both common and uncommon trends that occurred across the SMECLEs. Presented in Figure 6-2 is the cross comparison of the instances that were observed, where the first common trend was that both of the platforms were effective at enabling collaborative learning, however, each one offered different benefits. For example, it was observed that microblog enabled CLEs were most effective at enabling collaborative learning when the task was set to a yes/no answer, requiring learners to discuss why they were choosing one answer over the other, which mainly encouraged individual and assigned group activity among the learners. Blog enabled CLEs were most effective at enabling collaborative learning when the task was set to groups writing essay style paragraphs on assigned topics, where they were encouraged to read and comment on other learners posts, which mainly encouraged individual and class group activity, although there was much assigned group activity also. This knowledge provides insights to the educator that can be adopted the next time they wish to run a SMECLE by providing the type of outcomes that could be expected if they were to implement such environments. Trends were also identified across each of the collaborative learning characteristics, and *Active Learning* is introduced as an exemplar. Following this, the trends of the other collaborative learning characteristics are presented.

Active Learning as an Exemplar

For both the microblog enabled CLEs and blog enabled CLEs, *Active Learning* was the most instantiated collaborative learning characteristic for all of the classes that were run. The major trend that was observed across the *Active Learning* cells was as follows: when learners did respond to comments that were made in relation to the task (*Social Interaction*), answer questions that were asked (*Social Collaboration*), acknowledge content that was shared (*Content Sharing*), or acknowledged original content that was shared (*User Generated Content*), depending on the platform that was used, it was either predominantly an assigned group instance, or a class group instance. For example, with the microblog enabled CLEs, it was predominantly an assigned group learner who was acknowledging any of these instances, as evidenced in Figure 6-2, where there were very few class group instances. Instead, the majority of instances were assigned group members that were acknowledging them, with four of the social media characteristics enabling *Active Learning* at this level, across all three of the microblog enabled CLEs. This is in contrast to blog enabled CLEs, where it was almost the exact opposite. Here, it was predominantly class group members who were acknowledging any of the instances, as evidenced in Figure 6-2, where there were very few assigned group instances. Instead, the majority of instances were class group members that were acknowledging them, with four of the social media characteristics enabling *Active Learning* at this level, across all three of the blog enabled CLEs. The amount of these instances were often competing with the individual instances also.

The insights for the educator from this is that microblog enabled CLEs are effective at enabling *Active Learning* to occur at assigned group levels, while blog enabled CLEs are effective at enabling *Active Learning* at class group levels. This knowledge can be used by the educator when implementing a SMECLE in the future, where depending on the type of instances they wish to elicit, this can be used to inform their decision. Further, it may act as an indicator to the educator that they need to consider how they may be able to encourage different interactions in their SMECLE. For example, they may ask how they can encourage more class group or discipline community group instances in their microblog enabled CLEs, or more assigned group and discipline community group instances in their blog enabled CLEs.

Following the same method, the trends across the other collaborative learning characteristics were also observed, and this knowledge is presented in Table 6-8. While some may question whether prescriptive knowledge created from DSR creates valid knowledge due to a lack of truth value, Sonnenberg and vom Brocke (2012) argues that prescriptive knowledge that emerges through a DSR process does have a truth-like value. In this instance, the emerging trends were evaluated across six different cases, and each case was well documented, thus the prescriptive knowledge created here has a truth-like value. This prescriptive design knowledge thus satisfies the criteria for situated implementation of an artefact, and is a contribution to practice at Level 1 of Gregor and Hevner (2013) DSR contribution types.

Characteristic	**Trend**
Active Learning	Microblog enabled CLEs are effective at enabling *Active Learning* to occur at assigned group levels, while blog enabled CLEs are effective at enabling *Active Learning* at class group levels, when the task is to blog on different categories while commenting on other users blogs also.
Group Participation	Microblog enabled CLEs mainly enable *Group Participation* instances to occur at an assigned group level, which is in stark contrast to blog enabled CLEs, where the majority of instances occur at the class group level.
Role of the Instructor	Regardless of the platform being used, the instructors rarely interacted with the learners, both from initiating the interaction, or receiving it, with *Roll of the Instructor* instances only being observed through the *Social Interaction* and *User Generated Content* characteristics.
Learner Diversity	Microblog enabled CLEs did not enable *Learner Diversity*, but blog enabled CLEs did enable it through the *Social Interaction* and *User Generated Content* characteristics.
Learner Relationships	Regardless of the platform being used, the majority of Learner Relationships instances occurred at the learner-to-learner level, which is expected in a CLE.

Table 6-8: Observed Trends across the SMECLEs

Introduced in the following section is an explanation of the implications for practice following the instantiation of the SMECLE evaluation framework.

6.3.5 Implications for Practice

Twenty years ago, it was proclaimed that collaborative technologies were able to impact the learning environments of educational institutions. This occurred for a number of reasons, including educational institutions lack of change in their learning environments, especially in comparison to organisations adoption of such technologies (Alavi et al., 1995; Leidner and Jarvenpaa, 1995); lack of engaging students in the learning process (Alavi, 1994); educators, students, and employers feeling that technology could enhance learning (Alavi, 1994); and despite IS researchers highlighting *"the merits of information technology to improve communication, efficiency, and decision making in organizations"* (Leidner and Jarvenpaa, 1995, p.265), they were not applying this knowledge to their own learning environments. It is suggested that by actively engaging learners in the learning process, it should generate more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners. Despite research indicating that these collaborative technologies could impact the learning environments, and in a positive way, no change occurred. Twenty years later, and the very same claims are being made, where a new collaborative technology, namely social media, is being proclaimed to be able to impact the learning environments of education institutions, by changing, and possibly improving, the pedagogical approach. The impact again comes in the form of changing from a traditional learning approach, to a collaborative learning approach. However, there is a lack of understanding on whether the platforms that are enabled by social media are effective at enabling collaborative learning. This study helps towards improving this understanding.

Firstly, critical thinking was observed amongst learners when they were creating well thought out and reasoned arguments, when creating their own posts, or responding to other learners. For example, a learner wrote a blog post on the topic of strategic alignment, where they made a reasoned argument on economic challenges facing strategic alignment. Another learner then asked a question about it, got a detailed response, and then was asked for their opinion. They responded with their view, which was in agreement with the original poster, and gave their own reasons why. From the learner's perspective, they made comments such as *"Personally enjoyed the competitive comments, would read blogs from other titles in order to ask questions"*, *"Created a good platform for debate/discussion so what you posted you have to back up"*, and *"Made you form opinions"*. These observations and comments suggest that learners were exposed to different perspectives, while also forming their own opinions based on these, which facilitates the formation and/or modification of mental models, thus increasing learning effectiveness (Alavi, 1994).

Secondly, learners were also observed to be providing more creative responses. While learners providing generic answers were observed, there were many instances where learners used different techniques to provide varying types of answers. For example, one learner had the topic of *"What is the Role of a Systems Analyst"*, and while they wrote a generic introduction blog post, they followed this up by writing a blog post that focused on what recruitment agencies had been advertising for such a role. In their next blog they interviewed someone they knew in an organisation that worked as a systems analyst, and they wrote about what they said their role was. Their fourth blog then compared and contrasted what the recruitment agencies were looking for, and what a real life systems analyst was actually doing. From the learner's perspective, they made comments such as *"Some posts were really creative, not just on a basic IS level, but presenting interesting ideas in general"*, *"Made me research further into topics. Not just what the slides say"*, and *"I learned a lot from researching and posting myself"*. These observations and comments suggest that SMECLEs enhance learning by facilitating active construction and development of emergent knowledge (Alavi, 1994).

Thirdly, high-level reasoning strategies were also observed amongst learners. Rather than just copying and pasting content from sources (which was also observed), learners were seen to be using different types of content to be part of their arguments, showing their understanding of it. For example, a learner used information from different sources when discussing traditional methods of software development. First they provided an image of the waterfall model, and then proceeded to explain each of the steps that were in it. They also provided examples for each step, before giving their opinion on the method, based on what they had just learned. From the learner's perspective, they made comments such as *"Learnt more than just listening. We actually had to research"*, *"Gained a deeper understanding of many topics"*, and *"I thought writing and reading blogs were helpful and insightful"*. These observations and comments suggest that SMECLEs contribute to learning effectiveness by requiring learners to understand the content they are using to be able to incorporate as part of their arguments.

This knowledge indicates that the platforms of social media can be effective at enabling collaborative learning. Each of the outcomes expected from collaborative learning, namely critical thinking, creative responses, and higher level reasoning strategies, amongst learners, were observed across the six social media enabled collaborative learning environments. This was further confirmed by the insights provided by learners who participated in the learning environments when responding to an open-ended post-study questionnaire. Therefore if educators wish to generate more critical thinking, creative responses, and high-level reasoning strategies, amongst their learners, they need to actively engage learners in the learning process, and one such way of achieving this is by running SMECLEs. It is now up to educators to adopt them into their learning environments, and avoid the same mistake as twenty years ago, where the knowledge was not applied, which resulted in little change in the learning environments of educational institutions. The secondary contribution of this research, the IS DSR process model, is introduced next.

6.4 IS DSR Process Model for Developing Frameworks as an Artefact

This study makes an important contribution to DSR in terms of methodology, by extending an IS DSR process model that helps to produce and present a framework as a DSR artefact. This is in relation to (Lee et al., 2015), where the argument is made that the DSR community need to move away from the idea of DSR just producing IT artefacts, but should focus on IS artefacts. It has already been highlighted above that few researchers have produced frameworks through DSR, so this research contributes to the DSR community by showing how DSR can be used to produce a framework as an artefact. It is suggested that a process model is necessary to provide a template for producing DSR, and can also be used as a template for presenting it (Peffers et al., 2007; Kuechler and Vaishnavi, 2008; Gregor and Hevner, 2013). Also, by following such a process model, researchers can be more explicit about how they conducted their DSR, which helps strengthen the research by allowing readers evaluate the results of such research more easily (Peffers et al., 2007).

To develop the process model used in this study, extant IS DSR methodology literature was reviewed (Nunamaker et al., 1990; March and Smith, 1995; Rossi and Sein, 2003; Peffers et al., 2007; Kuechler and Vaishnavi, 2008), where their process models were compared and contrasted. From this review it was evident that often the process elements used in each process model were very similar, with some of the models having additional elements. This provided an opportunity to develop a more robust process model, by fusing together the consistent process elements that occur across the five process models. The resulting IS DSR process model is presented in Figure 6-3.

However, where this process model differs from the others in the IS literature, is it utilises the seven DSR guidelines offered by Hevner et al. (2004) to help guide each process element, as shown in Figure 6-3. This has not been observed in the literature previously, and greatly enhances the process model by providing further clarity to researchers in terms of how to successfully complete each process element. This is an important addition, as Hevner et al. (2004, p.82) do not promote mandatory or rote use of these guidelines, but instead insist researchers should use their *"creative skills and judgment to determine when, where, and how to apply each of the guidelines in a specific research project"*. This allowance of *"pick and mix"* behaviour can potentially dilute the standard of DSR, as researchers' could position their research as design science based by following only one of the seven guidelines, as they will have used their creative skills and judgement. This impacts negatively on the IS design science paradigm, where other researchers outside the paradigm in the IS discipline could potentially see it as lacking rigor. Thus, if DSR researchers adhere to this process model to conduct and present their research when developing a framework, it can only help strengthen the outcome, and improve the perception of the paradigm as a whole.

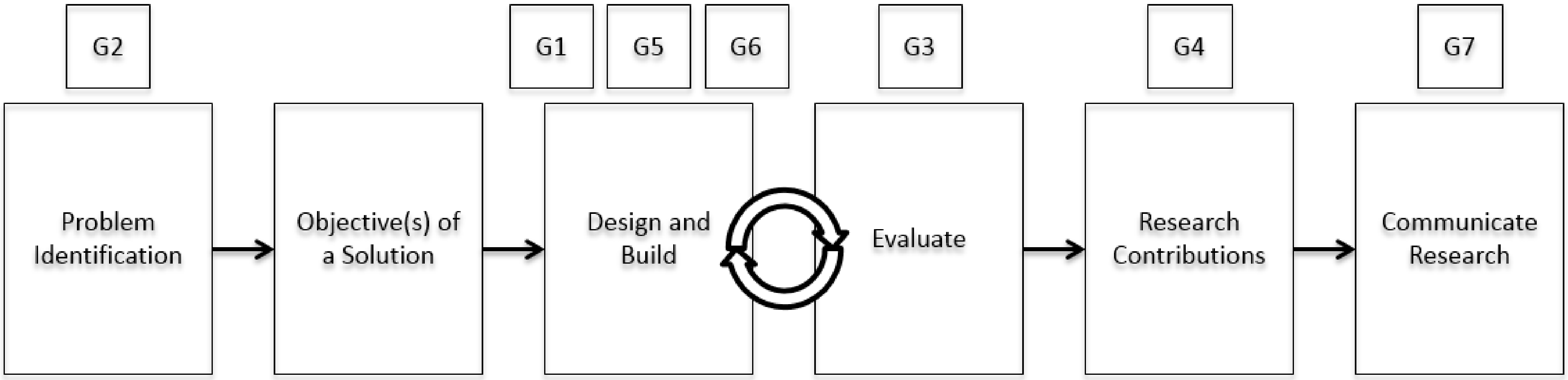

Figure 6-3: The IS Design Science Research Process Model Used for this Study

To demonstrate the use of the IS DSR process model, it was evaluated by its application to produce and present this study. It is understood that DSR researchers need to be more explicit and open about how they produce their DSR, which is achievable by presenting it in terms of the IS DSR process model they use. Thus, for this study, each stage was explicitly outlined in the presentation of this research, with clear explanations, which is what the DSR community has been endeavouring towards. This clarity stands to reduce claims that this DSR is unreliable, and strengthens the outcome of this research. It also demonstrates the IS DSR process model's ability to be efficient at creating valuable DSR, especially when developing a framework. This concludes the contributions from this study, and introduced next is an overview of the study, its limitations, and future work.

6.5 Future Work

In addition to the contributions that have been made to academia and practice by this study, a number of directions for future research and practice can be outlined, beginning with the future directions for research.

6.5.1 Future Directions for Research

The design principles (DPs) for creating a SMECLE must be further investigated. This study extracted a set of DPs to build CLEs, and used these to build two types of SMECLEs, with microblogs and blogs. Further research could evaluate the strength of these DPs, and explain how they can be applied to other types of SMECLEs. This also brings the necessary focus on evaluating other types of SMECLEs, as further applications are required, where there is an opportunity to use the four other types of social media platforms to do so. This could provide an understanding how platforms such as social networking sites, virtual worlds, or collaborative projects, can be utilised to enable a SMECLE, and generate an understanding to their effectiveness for learning.

The SMECLE evaluation framework could be tested and further developed where necessary, based on the evaluation of SMECLEs that are implemented elsewhere. Currently, this research adds to the knowledge base in terms of trends that were observed across the six case studies here, but these trends require further investigation. While a number of trends have been highlighted from the types of SMECLEs that were run in this study, it is necessary to confirm that these trends are consistent when the same types of SMECLEs are run by others. From this, knowledge regarding both microblog and blog enabled CLEs will start to build, which benefits both research and practice. Perhaps much further away, but the evaluation framework as it currently stands is a manual process, where the instructor is required to analyse the data by reviewing it, and based on the rule, indicating whether an instance has occurred or not. There is the potential to build a system that is capable of automating this process, which would popularise the evaluation framework, requiring an upload of the file that is then checked based on the coded rules, indicating whether an instance has occurred or not.

Lastly, the importance of the task to the types of learning environments must be further investigated. This study focused on similar tasks, depending on the type of environment, but when they differed it was obvious that it impacted the interactions that occurred. For example, two of the microblog enabled CLEs had a task of defining some concepts, while the third asked the learners to answer a question. It was evident that these two tasks impacted the interactions that occurred, where the trends indicated the one about answering the question resulted on a more collaborative approach, with learners asking questions of each other, and agreeing or disagreeing. Thus, further research on the impact of the task in SMECLEs would allow a better understanding of how best to enable CLEs.

6.5.2 Future Directions for Practice

Twenty years ago, research indicated to practice that collaborative technologies such as GDSS were capable of impacting their learning environments. This impact came by suggesting the learning environments should be transformed from a traditional approach, to a collaborative one, where the learner is involved in the learning process. From this, it should generate more critical thinking, creative responses, and high-level reasoning strategies, amongst the learners. However, this knowledge was never really adopted, and the learning environments have remained similar since. A new collaborative technology, namely social media, are again being proclaimed to impact the learning environments, and shown to able to do so in this study. Therefore, in agreement with Kane and Fichman (2009), it is recommended that educators should try adopting, and implementing these types of learning environments. This research provides many insights in terms of how to create SMECLEs, and the trends that can be seen in two types, namely microblog, and blog, enabled CLEs. This provides an opportunity to further test these, and other types of SMECLEs with different types of social media platforms. Further, these types of learning environments may have a reach beyond educational institutions, and it is only through implementing them that further knowledge can be generated in terms of their applicability, and usefulness. Therefore another call would be for other types of organisations to begin experimenting with them. Following these future directions for research, and practice, the limitations of the study are outlined next.

6.6 Limitations of the Study

All research has limitations to it, which can be constrained by a number of factors, and this is no different in this study, despite the best efforts to avoid so. These limitations are discussed in this section so that they can be addressed and improved upon in future studies.

The first concerns the representativeness of the sample of articles that were reviewed. For each of the literature reviews that were conducted, for DSR, social media, and collaborative learning, the sources used were the the AIS senior scholars' basket of (eight) journals, and the conferences of AMCIS, ICIS, and ECIS. Each of these is considered quality resources in terms of IS research, however, it may be argued that some other sources would have also benefited the research. For example, the Design Science Research in Information Systems and Technology (DESRIST) conference may have been another source that could have provided a greater sample of articles for DSR; A and B journals may have provided further samples of social media articles since it is still an emerging topic; and research in the learning discipline may have provided further articles in terms of collaborative learning. However, it is felt that the sources provided offered a large enough sample of articles, and without the constraint of time, it would have been possible to extend this search further.

Further, this study focused on building SMECLEs with two types of social media platforms, namely microblogs, and blogs, while there are four other types available that could also be used. Unfortunately, again due to time constraints, it was not possible to extend this research to evaluate more of these platforms. It must be noted an effort was made to use another platform, namely social networking sites, with the service being Facebook, to set up a SMECLE. However, due to large volumes of learners joining at the same time, the service presumed it was a bot as opposed to humans joining, and started shutting down learner's accounts, and caused the SMECLE to fail. Instead it was decided to focus on another type of social media platform, namely blogs.

Another limitation rests in the fact that the SMECLE evaluation framework was not utilised by the instructors that ran the SMECLEs, mainly due to the fact that the evaluation framework was still being built. It would be beneficial to have such instructors to analyse the data they collected with the completed SMECLE evaluation framework. However, we believe that if the educators did use the SMECLE evaluation framework they would have generated similar trends but as it was not possible to do this, each instructor filled out a questionnaire in relation to their experience of running the SMECLE, which was used as further learning. Further to this, the learners participating in the classes came from different educational programs, and levels of education, which can impact on their willingness to participate in a class, but as was observed across the six SMECLEs, this did not prove to be the case. This could be something to do with the novelty of the learning environments, and can only be ruled out over more uses of the evaluation framework.

The final limitations of this research concern the subjective nature of some of the coding in the design, build, and evaluate phases, which are inevitable when interpreting data and are unavoidable. To try and overcome this, a rigorous process was used across each of these phases, when collecting, analysing, and interpreting the data.

6.7 Summary

DSR needs to make contributions to both practice and the knowledge base for it to be considered DSR, and separate it from the mere task of developing artefacts (Hevner, 2007; Winter, 2008). To achieve this, the research must be relevant to practice by being proven to solve or improve upon an identified problem, while making a contribution to the knowledge base that others can utilise in future research (Nunamaker et al., 1990; Hevner et al., 2004). In this chapter, the primary contribution presented, to both practice and the knowledge base, was the evaluation framework for social media enabled collaborative learning environments (SMECLEs). It is a contribution to the knowledge base in the form of a model, and methods, which can be utilised in future research. It is a contribution to practice by helping improve upon the identified problem, as it helps educators evaluate the effectiveness of their SMECLEs. Further, the instantiation provided some knowledge in relation to two types of SMECLEs, namely microblog, and blog, enabled CLEs that educators can apply when creating, and running their own SMECLEs. The secondary contribution presented in this chapter was a DSR process model. This process model provides the structure that can be utilised in the execution, and presentation, of DSR. Further, the reflections of the researcher when using this process model, which helps enrich it, provides insight that other research can adopt. Future work that can be conducted is also presented, as well as the limitation of the study. Overall, this study identified a number of contributions for both the knowledge base and practice, which advances research within the DSR, and IS academic domains.

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Appendices

Volume 2 of 2

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B.Sc., MBS

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Appendix A Evaluation of Microblog Enabled CLEs

Each case is therefore presented as follows. First, an introduction to the class is provided, with an overview of the instances that were observed presented in the SMECLE Evaluation Framework. Next, the trends that occurred in each SMECLE are discussed, and these are identified as *task based trends*, *characteristic based trends*, and *cell based trends*. *Task based trends* refer to the trends that were observed in the learning environments relating to how learners attempted to solve the task. *Characteristic based trends* are the trends that were observed in the learning environment relating to each of the collaborative learning characteristics. *Cell based trends* are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning.

Appendix A.1 Evaluation of IS6119 Microblog Enabled CLE

As identified in Chapter 1, IS6119 is an MBS module titled *"IT Organisation: Insourcing and Outsourcing"*, which consisted of 31 learners (19 male, 12 female) and one instructor. The task was set by the instructor, and required each group, of which there were eight, to define approaches to IS/IT outsourcing. A total of 421 tweets were sent for the duration of the class, and the activity was analysed using the SMECLE evaluation framework, with the results presented in Figure A-1, where a number of trends were identified at three different levels: *task based*, *characteristic based*, and *cell based*. These are presented next.

		#task is to define as many approaches to IS/IT #outsourcing as you can, specify the #uniqueness of each approach																	
		Collaborative Learning Characteristics																	
		Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
		I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Microblog	**Social Media Characteristics**																		
	Social Interaction	**59 76%**	**18 23%**	**1 1%**		**2 100%**			**3 50%**	**3 50%**							**3 10%**	**26 90%**	
	Social Collaboration	**28 64%**	**16 36%**			**4 100%**												**20 100%**	
	Content Sharing	**124 95%**	**6 5%**			**1 100%**												**8 100%**	
	User Generated Content	**23 82%**	**4 14%**	**1 4%**							**1 100%**							**8 100%**	
	Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure A-1: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS6119 SMECLE

Appendix A.1.1 Task Based Trends

The task set for IS4428 was an open one, as is needed in a collaborative learning environment, since it allowed assigned groups to identify and define as many, or as few, approaches to IS/IT outsourcing as they wanted. This resulted in assigned groups taking different approaches when identifying what was needed to complete the task. Some assigned groups discussed it amongst themselves, where a group member would suggest a number of approaches, with other group members agreeing with it, or sometimes adding to the list. For example:

User Generated Content, Active Learning: Assigned Group Level		
Tweet Reference: G5T3	**Learner Name:** @ISBP111223087	**Assessment**
#Group 5 - I guess we're looking at onshore, offshore, selective and multi-sourcing.		A learner creates and shares some original content *(User Generated Content)* by suggesting a number of different approaches the group can look at for the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
Tweet Reference: G5T8	**Learner Name:** @ISBP111223087	**Assessment**
#Group 5 - Ya, will we start by looking at one of those 4 area's each or does anyone have another suggestion?		The same learner then looks for confirmation from their group members to see if they have any other approaches.
In response to @ISBP111223087		
Tweet Reference: G5T9	**Learner Name:** @ISBP111223107	**Assessment**
@ISBP111223087 No That sounds good		An assigned group member acknowledges the original content by agreeing with it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-1: Assigned group members discussing topics to focus on for the task

Other learners in the class group, on seeing this list being generated, retweeted it to their own groups, so they too had a list of approaches they could focus on, again with group members sometimes adding to the list. For example:

Content Sharing, Active Learning: Assigned Group Level		
Tweet Reference: G3T6	**Learner Name:** @isbp103464679	**Assessment**
#Group 5 - I guess we're looking at onshore, offshore, selective and multi-sourcing.		A class group member shares some content in the form of text *(Content Sharing)* by retweeting another groups list of approaches that they decided to focus on, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @isbp103464679		
Tweet Reference: G3T8	**Learner Name:** @ISBP107463430	**Assessment**
Excellent, but should we mention something about cloud computing?		An assigned group member responds to the shared content, and suggests another potential approach they should focus on, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-2: Learners use a collaborative approach to complete the task

A third approach that was taken was by another assigned group, who shared a link to an article, and formed their list of approaches from it. For example:

Content Sharing, Active Learning: Assigned Group Level		
Tweet Reference: G1T9	**Learner Name:** @ISBP111222288	**Assessment**
#G1 We could take the following http://en.wikipedia.org/wiki/Outsourcing … - check out see also section		A learner shares some content, in the form of a link *(Content Sharing)*, explaining where to look for a list of approaches they could look at *(Active Learning)*.
In response to @ISBP111222288		
Tweet Reference: G1T16	**Learner Name:** @ISBP107397577	**Assessment**
# Group1 our list so far is selective outsourcing, multisourcing, total sourcing, offshore, vested outsourcing.		An assigned group member acknowledges this by coming back a few minutes later with a shortened list for the group to focus on, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-3: A learner sharing content, which is used by another learner to create a list of topics to focus on

The task also impacted on how assigned groups decided to answer it, as it allowed them to divide the work between each other. So while all the assigned groups identified approaches that they needed to define, as shown above, the majority of them then divided the work between each other, leading to a more cooperative approach to completing the task. For example:

<table>
<tr><th colspan="3">Social Interaction, Active Learning: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G3T16</td><td>Learner Name:
@ISBP107463430</td><td>Assessment</td></tr>
<tr><td colspan="2">@ISBP111223107 we could all take one area. For example i'll look into multisourcing. The rest of #group3 could take onshore,selective, etc..</td><td>A learner makes a comment (Social Interaction) in relation to the task by suggesting they divide the task up between assigned group members, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @ISBP107463430</td></tr>
<tr><td>Tweet Reference:
G3T20</td><td>Learner Name:
@ISBP103464679</td><td>Assessment</td></tr>
<tr><td colspan="2">#Group 3 @ISBP111223107 @ISBP107463430 I'll take selective... which do u want to take? #outsourcing</td><td>An assigned group member then acknowledges this by making a comment (Social Interaction) by agreeing with them, and mentions the topic they will focus on, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to G3T16 and @ISBP103464679</td></tr>
<tr><td>Tweet Reference:
G3T21</td><td>Learner Name:
@ISBP111223107</td><td>Assessment</td></tr>
<tr><td colspan="2">I'll take a look at Offshore for #Group3 so.</td><td>A third assigned group member also acknowledges this by making a comment (Social Interaction) also agreeing, and mentions the topic they will focus on, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the comment was an assigned group member, this instance occurred at the assigned group level.</td></tr>
</table>

Table A-4: Learners use a cooperative approach to complete the task

As a result of this cooperative approach, learners focused on researching their chosen outsourcing approach in order to complete the task, allowing for little or no discussion on what their group members were saying about the other approaches to outsourcing. For example, it is evident that in each of the instances where a social media characteristic enabled *Active Learning*, the majority occurred at the individual level, with little, to no, assigned group, class group, or discipline community group activity being observed (see Figure A-1). While most learners were sending tweets, trying to discuss the task, to ask questions, sharing content, or generating and sharing content, in relation to their part of the task, they were getting very few responses. For example:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G7T33	**Learner Name:** @ISBP111223912	**Assessment**
#Group 7 - Bearing in mind disadvantages, the success of selective outsourcing will hinge on how the relationship is managed Kakabadse 2005		A learner shares some content, in the form of text *(Content Sharing)*, explaining why *(Active Learning)*. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-5: An Instance of Content Sharing Enabling Active Learning at the Individual Level

By learners focusing on their chosen topic, it reduced the potential for collaboration, as learners were less likely to question other learners on their chosen topics, acknowledge content that was being shared. This was a regular occurrence throughout IS6119, which consisted of learners mainly sharing content in relation to the part of the task they chose to focus on. Further to this, because learners were focused on their own specific topics, the majority of content that was shared was only beneficial to the learner who shared the content, evidenced by 95% on instances occurring at the individual level. The *characteristic based trends* are presented next.

Appendix A.1.2 Characteristic Based Trends

Active Learning

Active Learning occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. This can be enabled by any of the social media characteristics, from discussing the task (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners (*Social Collaboration*), sharing some content (*Content Sharing*), and generating some content, and sharing it (*User Generated Content*). Depending on who acknowledges it, *Active Learning* can be enabled at different levels: individual; assigned group; class group; and/or discipline community group.

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Active Learning*, but not at all levels (see Figure A-1). For example, *Active Learning* was enabled by *Social Interaction* when learners tried to discuss how they were going to complete the task, who was going to take what part, and how they would deliver their final answers, with instances occurring across three levels: individual; assigned group; and class group; with no discipline community group instances. The single class group instance occurred when a class group member retweeted a comment a user had made in relation to class slides to look at. *Active Learning* was enabled by *Social Collaboration* when learners asked questions of other learners, and when learners agreed, and disagreed with each other, with instances occurring across two levels: individual; and assigned group, with no class group, or discipline community group instances. For example:

Social Collaboration, Active Learning: Assigned Group Level		
Tweet Reference: G2T64	**Learner Name:** @ISBP107636563	**Assessment**
So if cant control what the vender is doing, the security is the big problem? #isbpgroup2		An assigned group member asks another assigned group member a question *(Social Collaboration)* in relation to the task, based on a point they make, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP107636563		
Tweet Reference: G2T70	**Learner Name:** @ISBP111223752	**Assessment**
@ISBP107636563 #isbpgroup2 i agree with u, maybe the security and operating will be the big problem		The assigned group member responds, and agrees with the other group member *(Social Collaboration)*, and offers a reason why *(Active Learning)*. As the learner who acknowledged the question was an assigned group member, this instance occurred at the assigned group level.

Table A-6: An Instance of Social Collaboration Enabling Active Learning at the Assigned Group Level

Active Learning was also enabled by *User Generated Content* by learners giving their opinion to a discussion in relation to the task, with instances occurring across three levels: individual; assigned group; and class group; with no discipline community group instances. Further, *Active Learning* was enabled by *Content Sharing* when learners shared links, and information from articles, with instances occurring across two levels: individual; and assigned group, with no class group, or discipline community group instances. For example:

<table>
<tr><th colspan="3">Content Sharing, Active Learning: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G7T30</td><td>Learner Name:
@ISBP106006850</td><td>Assessment</td></tr>
<tr><td colspan="2">@ISBP107379412 read this first and get back to mehttp://is2.lse.ac.uk/asp/aspecis/20060071.pdf ...</td><td>A learner shares a link to an article with an assigned group member (Content Sharing) in relation to the task, and by suggesting that it could benefit them, they indicate they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @ISBP106006850</td></tr>
<tr><td>Tweet Reference:
G7T32</td><td>Learner Name:
@ISBP107379412</td><td>Assessment</td></tr>
<tr><td colspan="2">@ISBP106006850 interesting but i think its overarching point is undermined by the low response rate, see its methodology</td><td>An assigned group member acknowledges this content by commenting on it, but disagrees with it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.</td></tr>
</table>

Table A-7: An Instance of Content Sharing Enabling Active Learning at the Assigned Group Level

The second trend that was observed was that that the majority of instances occurred at the individual level for all of the characteristics. That is to say, when learners were trying to discuss the task, ask questions, share content, or generate and share original content, it was mainly only beneficial to the individual who did so. However, on the instances when other learners did acknowledge any of these interactions, it was mainly at the assigned group level, with only a total of two instances occurring at the class group level (see Figure A-1). The trends across *Group Participation* are presented next.

Group Participation

Group Participation occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. This can be enabled by any of the social media characteristics, from discussing the task, and getting a response from a group member, which gets a further response (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, and getting a response from a group member, which gets a further response (*Social Collaboration*), sharing some content, and having it acknowledged, which gets a further response (*Content Sharing*), and generating some content, sharing it, having it acknowledged, which gets a further response (*User Generated Content*). Depending on who acknowledges it, *Group Participation* can be enabled at different levels: assigned group; class group; and/or discipline community group.

The first trend across the *Group Participation* cells is that it was almost non-existent in the class, with a total of seven instances occurring. This is not what would be expected in a collaborative learning environment, as learners are expected to be involved in discussions about the task that would span more than two interactions. However, in the IS6119 SMECLE, it was observed that learners did not engage in such discussions, instead they mainly only lasted for two interactions. For example, *User Generated Content* did not enable a single instance to occur, meaning that when learners provided their opinion, few people questioned them on it, or agreed with it, meaning that a discussion could not be had.

The second trend across the *Group Participation* cells is that three of the social media characteristics (*Social Interaction, Social Collaboration*, and *Content Sharing*) enabled *Group Participation*, but all the instances were at the assigned group level (see Figure A-1). For example, *Group Participation* was enabled by *Social Interaction* twice when learners were discussing how to complete the task, which occurred at the assigned group level, with no class group, or discipline community group instances. *Group Participation* was enabled by *Content Sharing* once when a learner shared a link to an article that got acknowledged by an assigned group member, which also occurred at the assigned group level, with no class group, or discipline community group instances. *Social Collaboration* enabled the highest amount of *Group Participation* instances, with a total of four, which all occurred at the assigned group level, with no class group, or discipline community group instances. For example:

Social Collaboration, Group Participation: Assigned Group Level		
Tweet Reference: G6T54	**Learner Name:** @ISBP111223139	**Assessment**
@ISBP111223726 ok, do we need to define smart/right outsourcing?		A learner asks a question of their assigned group *(Social Collaboration)*, in relation to the task.
In response to @ISBP111223139		
Tweet Reference: G6T55	**Learner Name:** @ISBP111223726	**Assessment**
smart and right are the same as selective		One of the assigned group members acknowledges this by answering the question *(Group Participation)*.
In response to @ISBP111223726		
Tweet Reference: G6T56	**Learner Name:** @ISBP111223139	**Assessment**
@ISBP111223139 @ISBP111223726 how about you take smart and ill take right??		The first group member acknowledges this response *(Group Participation)*, and asks another question *(Social Collaboration)*.
In response to @ISBP111223139		
Tweet Reference: G6T58	**Learner Name:** @ISBP111223726	**Assessment**
@ISBP106681379 @ISBP111223139 they are the same thing		The other assigned group member acknowledges this again, explaining the same way they did previously *(Group Participation)*.
In response to @ISBP111223726		
Tweet Reference: G6T55	**Learner Name:** @ISBP111223139	**Assessment**
@ISBP106681379 right is smart :D finding right approaches		The learner eventually realises what they are saying, and a consensual answer is reached *(Group Participation)*. As this participation was only between assigned group members, this instance occurred at the assigned group level.

Table A-8: An Instance of Social Collaboration Enabling Group Participation at the Assigned Group Level

Following the trends that have been identified across *Group Participation*, the trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

Role of the Instructor is to provide a task to be completed, and offer qualified guidance when required. This can be enabled by any of the social media characteristics, from discussing the task *(Social Interaction)*, asking a question(s), or agreeing/disagreeing with other learners *(Social Collaboration)*, sharing some content, *(Content Sharing)*, and generating some content, and sharing it, *(User Generated Content)*. Depending on who acknowledges it, the *Role of the Instructor* can be enabled at different levels: individual; assigned group; class group; and/or discipline community group for *Social Interaction* and *User Generated Content*, while *Social Collaboration* and *Content Sharing* do not have these levels due to a lack of data.

The first trend across the *Roll of the Instructor* cells is that there are only a few instances, with a total of seven, which indicates that the instructor portrayed their role how it is expected. They generated the task, and provided it to the class at the beginning. They then took a step back, and allowed the learners to drive the discussion, and were ready for when learners required any guidance. This resulted in two of the social media characteristics enabling *Role of the Instructor*, with instances at three of the four levels. For example, *Role of the Instructor* was enabled by *User Generated Content* when the instructor created the task, and shared it with the class group, with the instance occurring at the class group level as learners acknowledged it by trying to complete it, and it was also retweeted by some. *Role of the Instructor* was also enabled by *Social Interaction* when the instructor noticed some learners discussing something incorrectly and intervened, with instances occurring across two levels: individual; and assigned group; with no class group, or discipline community group instances. For example:

Social Interaction, Role of the Instructor: Assigned Group Level		
Tweet Reference: G3T31	**Learner Name:** @ISBP103464679	**Assessment**
#group3 definitions will be emailed to u!		A learner sends a message, trying to inform the instructor that their group will email their answers to them *(Social Interaction).*
In response to @ISBP103464679		
Tweet Reference: I1T6	**Learner Name:** @ISBP93260857	**Assessment**
@isbp103464679 will you pop them on twitter		The instructor sees the comment, and asks them to put their answers on Twitter instead *(Social Interaction)*, which they acknowledge by doing so *(Role of the Instructor).* As this request was acknowledged by an assigned group member, this instance occurred at the assigned group level.

Table A-9: An Instance of Social Interaction Enabling Role of the Instructor at the Assigned Group Level

Following the trends that have been identified across *Role of the Instructor*, the trends observed across *Learner Diversity* are presented next.

Learner Diversity

Learner Diversity occurs when a learner can draw on their background to provide different perspectives on task-related information. This can be enabled by any of the social media characteristics, from discussing the task, drawing on their background (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, drawing on their background (*Social Collaboration*), sharing some content, drawing on their background (*Content Sharing*), and generating some content, and sharing it, drawing on their background (*User Generated Content*). Depending on who acknowledges it, *Learner Diversity* can be enabled at different levels: individual; assigned group; class group; and/or discipline community group for both

Social Interaction, and *User Generated Content*, while *Social Collaboration* and *Content Sharing* do not have these levels due to a lack of data.

The trend across *Learner Diversity* is that there is not a single instance of a social media characteristic enabling *Learner Diversity* (see Figure A-1). That is to say, when a learner shared content, asked questions, or gave their opinion, on no occasion did they explicitly draw on their backgrounds when doing so. This could potentially be due to the character limit set by Twitter, forcing learners to be very precise when sending a tweet. The trends observed across *Learner Relationships* are presented next.

Learner Relationships

A *Learner Relationship* occurs from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. This can be enabled by any of the social media characteristics, from discussing the task, and getting an acknowledgement (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, and getting an acknowledgement (*Social Collaboration*), sharing some content, and getting an acknowledgement (*Content Sharing*), and generating some content, and sharing it, and getting an acknowledgement (*User Generated Content*). Depending on who acknowledges it, the *Learner Relationships* can occur at three different levels: instructor-to-learner, learner-to-learner, and learner-to-instructor. It is expected in a CLE that the majority of relationships that get formed or strengthened would be learner-to-learner, as it should be learners interacting with each other, and only receiving guidance when required from the instructor.

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, but not at all the levels (see Figure A-1). For example, *Learner Relationships* were enabled by *Social Interaction* when learners discussed the task, and when the instructor observed the discussions that were taking place, and needed to provide guidance to some learners, with instances occurring across two levels: instructor-to-learner; and learner-to-learner; with no learner-to-instructor instances. *Learner Relationships* were enabled by *Content Sharing* when learners shared content that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content, that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. Finally, *Social Collaboration* also enabled *Learner Relationships* when learners asked questions and got responses by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. For example:

Social Collaboration, Learner Relationships: Learner-to-Learner		
Tweet Reference: G1T23	**Learner Name:** @ISBP111223725	**Assessment**
#Group1 is there a way to log the approaches so we can share out the work and then collaborate.		A learner asks their assigned group members a question in relation to the task *(Social Collaboration)*.
In response to @ISBP111223725		
Tweet Reference: G1T36	**Learner Name:** @ISBP111222288	**Assessment**
@ISBP111223725 I'm not sure how to do that to be honest Declan although we could add a hash tag for our selected approaches.		An assigned group member acknowledges the question by responding, forming/strengthening a learner-to-learner relationship *(Learner Relationships)*.

Table A-10: An Instance of Social Collaboration Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that the majority of relationships that were formed or strengthened were of a learner-to-learner type, which is expected in a collaborative learning environment. The cell based trends are presented next.

Appendix A.1.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Social Collaboration, Active Learning"*
- *"Content Sharing, Active Learning"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS6119 SMECLE.

Social Interaction, Active Learning

Social Interaction occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner discusses the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, and/or discipline community group level. The rules were set as follows (see Table A-11):

Cell	Level	Rules
Social Interaction, Active Learning (1.1.1)	Individual	A learner makes a comment in relation to the task, but no group member acknowledges it.
Social Interaction, Active Learning (1.1.2)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.
Social Interaction, Active Learning (1.1.3)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.
Social Interaction, Active Learning (1.1.4)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.

Table A-11: Cell Rules for Social Interaction, Active Learning

The first trend of the *"Social Interaction, Active Learning"* cell is that while there were many comments in relation to the task made by learners as evidenced in , the majority of these occurred at the individual level (76%). This indicates that while learners were making comments in relation to the task, few assigned, or class group members were responding to them, as evidenced by the low counts of instances, which are 23% and 1%, respectively, and there was not a single discipline community group instance.

The second trend of the *"Social Interaction, Active Learning"* cell is that when learners were acknowledging comments that were in relation to the task, they were mostly assigned group instances as opposed to class group instances (see Figure A-1). The only class group instance that occurred was when a class group member acknowledged a tweet that another class group member had sent, by saying they were going to also look at lecture slides. When assigned group members made comments in relation to the task, they discussed what the task meant, how they should complete the task, what sections of the task each learner was going to take, and how they should provide their answer for the task. Each of the assigned groups participated in these kinds of conversations. For example:

Social Interaction, Active Learning: Assigned Group Level		
Tweet Reference: G7T20	**Learner Name:** @ISBP107511108	**Assessment**
#Group7 Hey Martin, ya i think we are all taking a different area of outsourcing. Mark, what area are you doing?		A learner makes a comment *(Social Interaction)* in relation to the task by trying to tell another learner how they are going to do it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP107511108		
Tweet Reference: G7T22	**Learner Name:** @ISBP111223912	**Assessment**
#isbpgroup7, @ISBP107511108, sure i can look at selective there so		An assigned group member then acknowledges this by making a comment *(Social Interaction)*, stating the area they will focus on thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the comment was an assigned group member, this instance occurred at the assigned group level.

Table A-12: An Instance of Social Interaction Enabling Active Learning at the Assigned Group Level

The third trend of the *"Social Interaction, Active Learning"* cell is that the majority of *Social Interaction* came in the form of learners discussing how they were going to divide the task up between each other. The trends across *"Social Collaboration, Active Learning"* are presented next.

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if learners ask questions of other learners, or agree/disagree with other learners, in relation to the task, and explain why, an instance of *"Social Collaboration, Active Learning"* has occurred. Depending on who asks the questions, or agrees/disagrees, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rules were set as follows (see Table A-13):

Social Collaboration, Active Learning		
Social Collaboration, Active Learning (2.1.1)	Assigned Group	An assigned group member asks another assigned group member(s) a question(s) in relation to the task. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.2)	Class Group	A class group member asks another class group member(s) a question(s) in relation to the task. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.3)	Discipline Community Group	A discipline community member asks a class group member(s) a question(s) in relation to the task. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why.

Table A-13: Cell Rules for Social Collaboration, Active Learning

The first trend of the *"Social Collaboration, Active Learning"* cell is that while learners were asking questions of each other, and agreeing with others, as evidenced in , the majority of these occurred at the individual level (64%). This indicates that while learners were trying to engage with other learners, sometimes assigned group members were responding (36%), but there was not a single class group or discipline community group instance.

The second trend of the *"Social Collaboration, Active Learning"* cell is that when learners did acknowledge questions that were asked, or responded to other learners who agreed with them, they were always assigned group instances (see Figure A-1). That is to say, assigned group members were answering questions, or responding to learners when they agreed, and on a single occasion disagreed, with them. For example:

Social Collaboration, Active Learning: Assigned Group Level		
Tweet Reference: G4T23	**Learner Name:** @ISBP107480661	**Assessment**
could the strategic intent of the outsoucing be considered an approach @ISBP108573671 @ISBP111 223571 and yvonne		An assigned group member asks the other assigned group members a question *(Social Collaboration)* in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @ISBP107480661		
Tweet Reference: G4T24	**Learner Name:** @ISBP108573671	**Assessment**
@ISBP107480661 @ISBP111223571 ya totes on the right track there kirstie well done #winning		One of the assigned group members responds, and agrees with the suggestion *(Social Collaboration)*, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the question was an assigned group member, this instance occurred at the assigned group level.

Table A-14: An Instance of Social Collaboration Enabling Active Learning at the Assigned Group Level

The third trend of the *"Social Collaboration, Active Learning"* cell is that the majority of *Social Collaboration* was in the form of learners asking questions of each other, as opposed to learners agreeing, or disagreeing with each other. The trends across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are Actively Learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as follows (see Table A-15):

Cell	**Level**	**Rules**
Content Sharing, Active Learning (4.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (4.1.2)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.3)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.4)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, and shows their understanding of it.

Table A-15: Cell Rules for Content Sharing, Active Learning

With the most recorded instances of the entire class, the first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in , it was mostly only beneficial at an individual level (95%). This indicates that while learners were sharing content, few assigned group members acknowledged it (5%), and there was not a single class group or discipline community group instance.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, they were always assigned group instances (see Figure A-1). However, there were only six of these instances, which were dwarfed in comparison to individual instances. For example:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G4T38	**Learner Name:** @ISBP108573671	**Assessment**
research shows dt more firms opting for "selective O/S" wich means dt firms are hiring dif O/S providers for dif O/S tasks W Wyatt#group4		A learner shares some content, in the form of text *(Content Sharing)*, explaining a topic, and tries to give a reference *(Active Learning)*, but no other learner acknowledges it so the instance occurred at an individual level. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-16: An Instance of Content Sharing Enabling Active Learning at the Individual Level

The third trend of the *"Content Sharing, Active Learning"* cell is that the dominant type of content that was shared was in the form of text, where learners offered information already known on a specific concept but rarely gave a source, or provided quotes from a source. The second most dominant type of content shared was in the form of URLs, with learners linking to different types of content such as video, PDFs, and images. This would be expected on a microblogging platform, as you cannot embed content into tweets.

Appendix A.2 Evaluation of IS3101 Microblog Enabled CLE

As identified in Chapter 1, IS3101 is a 3rd year undergraduate module titled *"Health Information Systems and e-Health"*, which consisted of 7 learners (4 male, 3 female) and one instructor. The task was set by the instructor, and required each group, of which there were two, to decide if the internet is a good place for patients to source information for their health conditions, and each group was given a specific condition to focus on. A total of 137 tweets were sent for the duration of the class, and the SMECLE evaluation framework was used to analyse the environment, with the results presented in Figure A-2. Again, a number of trends were identified at three different levels: *task based*, *characteristic based*, and *cell based*. These trends are presented in the next section.

			As a group, evaluate if the internet is a good place for patients to source information about their health conditions.																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Microblog	Social Media Characteristics	Social Interaction	**16 53%**	**14 47%**			**1 100%**			**2 100%**									**13 87%**	**2 13%**
		Social Collaboration	**10 40%**	**15 60%**			**6 100%**												**14 100%**	
		Content Sharing	**24 92%**	**2 8%**															**3 100%**	
		User Generated Content	**7 32%**	**15 68%**			**2 100%**				**3 75%**	**1 25%**							**9 100%**	
		Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure A-2: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS3101 SMECLE

Appendix A.2.1 Task Based Trends

The task set for IS3101 was an open one, as it allowed learners to decide for themselves whether or not the internet was a good source for information on health conditions. With no definitive answer available, both groups realised that they needed to provide reasons as to why they wished to say 'yes' or 'no' to the task question. Both groups began in a similar way, where they started to provide links to sites that explained the specific topic that they were to focus on. For example, Group 1 started with the following tweet:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G1T5	**Learner Name:** @hiseh111706809	**Assessment**
#hiseh_teama http://en.wikipedia.org/wiki/Tonsillectomy … this is where most people would start anyways!		A learner shares some content in the form of a link *(Content Sharing)* to a Wikipedia page on the topic their group must focus on, and explains why *(Active Learning).* As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-17: An Instance of Content Sharing Enabling Active Learning at the Individual Level

Group 2 also started with the same approach, sharing links to different sites that discussed their topic of focus. For example:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G1T5	**Learner Name:** @hiseh111706809	**Assessment**
#hiseh_teamb http://www.magicmum.com/phpBB/viewtopic.php?p=4632933&sid=961a42ab9893c500bb45631cfbfe533d … Irish Forum		A learner shares some content in the form of a link *(Content Sharing)* to a forum, and explains why *(Active Learning)*. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-18: An Instance of Content Sharing Enabling Active Learning at the Individual Level

Both groups continued this way for the first few tweets, sharing links to sites, and on two occasions having assigned group members commenting on the links shared. However, both groups then took a collaborative approach to the task, where they began to discuss the actual question. For example, in Group 1, a learner asked the following question, to which they received numerous answers from the other group 1 members:

Social Collaboration, Group Participation: Assigned Group Level		
Tweet Reference: G1T17	**Learner Name:** @hiseh110313195	**Assessment**
#hiseh_teama pros and cons of internet for tonsillitis?		A learner asks a question of her assigned group *(Social Collaboration),* in relation to the task.
In response to @hiseh110313195		
Tweet Reference: G1T18	**Learner Name:** @hiseh111706809	**Assessment**
#hiseh_teama con- too much info		One of the assigned group members acknowledges this by answering the question *(Group Participation).*
In response to @hiseh110313195 and @hiseh111706809		
Tweet Reference: G1T21	**Learner Name:** @hiseh110300233	**Assessment**
#hiseh_teama def a tonne of info available, the forums suggest a lot of individual differences with pain experienced post surgery though		Another assigned group member also responds *(Group Participation),* giving their view on it.
In response to @hiseh111706809 and @hiseh110300233		
Tweet Reference: G1T22	**Learner Name:** @hiseh110313195	**Assessment**
#hiseh_teama overall the internet cant replace a diagnosis &surgical management		The learner who asked the original question then responds *(Group Participation),* giving their opinion on it. As this participation was only between assigned group members, this instance occurred at the assigned group level.

Table A-19: Learners take a collaborative approach to completing the task

This discussion continued for the rest of the Group 1's tweets, except for a link being shared every so often, until they eventually reached a conclusion, and they provided the following answer to the task:

<table>
<tr><th colspan="3">User Generated Content, Active Learning: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G1T34</td><td>Learner Name:
@hiseh110313195</td><td>Assessment</td></tr>
<tr><td colspan="2">#hiseh_teama so, in summary a valuable resource, assuming it's reliable, but not enough by itself. sorted.</td><td>A learner creates some original content (User Generated Content) in relation to the task, by giving their opinion based on what they discussed, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @hiseh110313195</td></tr>
<tr><td>Tweet Reference:
G1T35</td><td>Learner Name:
@hiseh111706809</td><td>Assessment</td></tr>
<tr><td colspan="2">#hiseh_teama @hiseh110313195 well said #tidy</td><td>An assigned group member acknowledges the original content by agreeing with it, and explains why, showing their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.</td></tr>
</table>

Table A-20: A Learner provides an answer to the task, and an assigned group member agrees with it

Group 2 followed a very similar path, where they too took a collaborative approach to completing the task. They initially started questioning each other on what exactly they needed to do, i.e. continue sharing links to websites, or actually discuss whether the internet is a good source for health information. For example:

<table>
<tr><th colspan="3">Social Interaction, Group Participation: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G2T26</td><td>Learner Name:
@hiseh108498512</td><td>Assessment</td></tr>
<tr><td colspan="2">So must we just post sites relating to the condition or must we discuss the options for this woman?? #hiseh_teamb</td><td>A learner makes a comment (Social Interaction) in relation to the task, where they are trying to establish what the group are doing.</td></tr>
<tr><td colspan="3">In response to @hiseh108498512</td></tr>
<tr><td>Tweet Reference:
G2T28</td><td>Learner Name:
@hiseh103466507</td><td>Assessment</td></tr>
<tr><td colspan="2">#hiseh_teamb thought that was next week for discussion</td><td>An assigned group member acknowledges the comment (Group Participation) and answers their question.</td></tr>
<tr><td colspan="3">In response to @hiseh103466507</td></tr>
<tr><td>Tweet Reference:
G2T32</td><td>Learner Name:
@hiseh109751564</td><td>Assessment</td></tr>
<tr><td colspan="2">#hiseh_teamb Yeah don't we need to answer the question whether the internet is a good means of finding info for this person?</td><td>This is further acknowledged by another assigned group member (Group Participation), who explains that they do need to discuss something. As the learners who acknowledged the comment were assigned group members, this instance occurred at the assigned group level.</td></tr>
</table>

Table A-21: Learners discuss what they must do to complete the task

They eventually came to the consensus that they needed to discuss it, with the initial discussion resulting in the learners starting to answer the task, where they gave their opinions on why it may or may not be a good source for information. In fact, they began to explain why certain sites that they had shared were good, and then asking questions of each other, from different angles. For example:

Social Collaboration, Group Participation: Assigned Group Level		
Tweet Reference: G2T47	**Learner Name:** @hiseh103466507	**Assessment**
#hiseh_teamb do you think doctors would approve of the sites though? reliable information/scaremongering		A learner asks a question of their assigned group *(Social Collaboration)*, in relation to the task.
In response to @hiseh103466507		
Tweet Reference: G2T48	**Learner Name:** @hiseh108498512	**Assessment**
@hiseh109751564 @hiseh103466507 doctors recommending sites to look at wud be the best way to go		One of the assigned group members acknowledges this by answering the question *(Group Participation)*. As the learner who acknowledged the question was an assigned group member, this instance occurred at the assigned group level.

Table A-22: Learners take a collaborative approach to completing the task

This discussion between members of Group 2, which consisted of asking questions, justifying answers, and reaching consensual answers continued for the rest of the class, before they eventually gave a consensual answer:

User Generated Content, Active Learning: Assigned Group Level		
Tweet Reference: G2T73	**Learner Name:** @hiseh109751564	**Assessment**
Yes, but should not be used in place of a doctor, rather as a medium of support for chronic conditions or as a source of further info		A learner creates some original content *(User Generated Content)* in relation to the task, by providing an answer, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @hiseh109751564		
Tweet Reference: G2T75	**Learner Name:** @hiseh108498512	**Assessment**
#hiseh_teamb Our answer is pure dacent to be fair		An assigned group member acknowledges the original content by agreeing with it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-23: A Learner provides an answer to the task, and an assigned group member agrees with it

Following the trends that have been identified across IS3101, the *characteristic based trends* are presented next.

Appendix A.2.2 Characteristic Based Trends

Active Learning

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Active Learning*, but not at all levels (see Figure A-2). For example, *Active Learning* was enabled by *Social Interaction* when learners discussed the task, with instances occurring across two levels: individual; and assigned group; with no class group or discipline community group instances. *Active Learning* was enabled by *Social Collaboration* when learners asked questions of other learners, and got replies, as well as instances of learners agreeing with other learners, but there was no instance of a disagreement. Theses occurred across two levels: individual; and assigned group, with no class group, or discipline community group instances. For example:

Social Collaboration, Active Learning: Individual Level		
Tweet Reference: G2T46	**Learner Name:** @hiseh108498512	**Assessment**
@hiseh109751564 I agree, they seem to be quite popular and would definetly help the women to understand and manage this condition better		An assigned group member responds to an opinion left by an assigned group member, and agrees with them *(Social Collaboration)*, explaining why. As no other learner acknowledged it, the instance occurred at the individual level. As no other learner acknowledged the agreement, the instance occurred at the individual level.

Table A-24: An Instance of Social Collaboration Enabling Active Learning at the Individual Level

Active Learning was also enabled by *Content Sharing* when learners shared links to numerous websites, and discussion boards, which were related to the topic they were to focus on for the task, with instances occurring across two levels: individual; and assigned group, with no class group, or discipline community group instances. Further, *Active Learning* was enabled by *User Generated Content* by learners giving their opinions, with instances occurring across two levels: individual; and assigned group, with no class group, or discipline community group instances. For example:

User Generated Content, Active Learning: Assigned Group Level		
Tweet Reference: G2T40	**Learner Name:** @hiseh109751564	**Assessment**
#hiseh_teamb forums seem to be a good way for women to tell each other what to expect with the condition and helping them to Relax about It		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @hiseh109751564		
Tweet Reference: G2T41	**Learner Name:** @hiseh108498512	**Assessment**
#hiseh_teamb Yep, there seems to be loads of info about it from a doctor/patient perspective and the forums see really helpful too		An assigned group member acknowledges the original content by agreeing with it, and explains why, showing their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-25: An Instance of User Generated Content Enabling Active Learning at the Assigned Group Level

The second trend that was observed was that instances were not dominated by individual instances, but instead assigned group instances had a higher count for both *Social Collaboration* and *User Generated Content*, while *Social Interaction* instances were similar in counts (see Figure A-2). This indicates that when learners were leaving comments about the task, asking questions of each other, as well as agreeing with each other, and giving their opinions, they were getting acknowledged by assigned group members. However, there were no class group, or discipline community group instances of any of these characteristics enabling *Active Learning*. The trends across *Group Participation* are presented next.

Group Participation

The first trend across the *Group Participation* cells is that it was almost non-existent in the class, with a total of nine instances occurring, despite both groups taking a collaborative approach to solving the task. In the IS3101 SMECLE, it was observed that learners did not engage in such discussions, instead they mainly only lasted for two interactions before moving on. For example, *Content Sharing* did not enable a single instance to occur, meaning that when learners shared content, few people acknowledged it, meaning that there were few discussions about the content, and how it could be helpful towards solving the task.

The second trend across the *Group Participation* cells is that three of the social media characteristics (*Social Interaction, Social Collaboration, and User Generated Content*) enabled *Group Participation*, but all the instances were at the assigned group level (see Figure A-2). For example, *Group Participation* was enabled by *Social Interaction* twice when learners discussed the task, which occurred at the assigned group level, with no class group, or discipline community group instances. *Group Participation* was enabled by *User Generated Content* twice, where in both instances a learner offered a definition, and a discussion occurred around it, which also occurred at the assigned group level, with no class group, or discipline community group instances. *Social Collaboration* enabled the highest amount of *Group Participation* instances, with a total of six, which all occurred at the assigned group level, with no class group, or discipline community group instances. For example:

Social Collaboration, Group Participation: Assigned Group Level		
Tweet Reference: G2T74	**Learner Name:** @hiseh109751564	**Assessment**
#hiseh_teamb Just put up a tweet there but couldn't # tag it - does everyone agree that would be our opinion? feel free to change it!!		A learner asks a question of their assigned group members *(Social Collaboration)* in relation to the task.
In response to @hiseh109751564		
Tweet Reference: G2T75	**Learner Name:** @hiseh108498512	**Assessment**
#hiseh_teamb Our answer is pure dacent to be fair		One of the assigned group members acknowledges this by answering the question *(Group Participation)*.
In response to @hiseh109751564 and @hiseh108498512		
Tweet Reference: G2T41	**Learner Name:** @hiseh110311731	**Assessment**
@hiseh109751564 i second that		Another learner then acknowledges this, and agrees with them also *(Group Participation)*. As this participation was only between assigned group members, this instance occurred at the assigned group level.

Table A-26: An Instance of Social Collaboration Enabling Group Participation at the Assigned Group Level

Following the trends that have been identified across *Group Participation*, the trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

The first trend across the *Roll of the Instructor* cells is that there are only a few instances, with a total of six, which indicates that the instructor portrayed their role how it is expected. They generated the task, and provided it to the class at the beginning. They then took a step back, and allowed the learners to drive the discussion, and were ready for when learners required any guidance. This resulted in two of the social media characteristics enabling *Role of the Instructor*, with instances at three of the four levels. For example, *Role of the Instructor* was enabled by *User Generated Content* when the instructor created the task, and shared it with the class group, and they also shared a specific part of the task to each of the assigned groups, so instances occurred at the assigned group level, and class group level as learners acknowledged it by trying to complete it. Interestingly, rather than just tweeting the task, the instructor created the content in the form of images, which contained the task for each group, and then they tweeted the links to each group. *Role of the Instructor* was also enabled by *Social Interaction* when the instructor was asked a question by assigned group members, and they answered them, but as they got no response from the learners, these instances occurred at the individual level, with no assigned group, class group, or discipline community group instances. For example:

<table>
<tr><th colspan="3">Social Interaction, Role of the Instructor: Individual Level</th></tr>
<tr><td>Tweet Reference:
G2T71</td><td>Learner Name:
@hiseh108498512</td><td>Assessment</td></tr>
<tr><td colspan="2">@InstCMahony Hi, must we answer the question right now or is that for next week's class?</td><td>A learner makes a comment (Social Interaction) in relation to the task, looking for guidance.</td></tr>
<tr><td colspan="3">In response to @hiseh108498512</td></tr>
<tr><td>Tweet Reference:
I1T6</td><td>Learner Name:
@InstCMahony</td><td>Assessment</td></tr>
<tr><td colspan="2">@hiseh108498512 as long as you can explain that answer next week using examples and the group agrees</td><td>The instructor responds to the learner, and explains what they should do (Role of the Instructor). As no learner acknowledged this response, the instance occurred at the individual level.</td></tr>
</table>

Table A-27: An Instance of Social Interaction Enabling Role of the Instructor at the Individual Level

Following the trends that have been identified across *Role of the Instructor*, the trends observed across *Learner Diversity* are presented next.

Learner Diversity

The trend across *Learner Diversity* is that there is not a single instance of a social media characteristic enabling *Learner Diversity* (see Figure A-2). That is to say, when a learner shared content, asked questions, or gave their opinion, on no occasion did they explicitly draw on their backgrounds when doing so. This could potentially be due to the character limit set by Twitter, forcing learners to be very precise when sending a tweet. The trends observed across *Learner Relationships* are presented next.

Learner Relationships

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, but not at all the levels (see Figure A-2). For example, *Learner Relationships* were enabled by *Content Sharing* when learners shared content that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content, that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. *Social Collaboration* also enabled *Learner Relationships* when learners asked questions and got responses by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. Finally, *Learner Relationships* were enabled by *Social Interaction* when learners discussed the task, and when learners asked questions of the instructor, with instances occurring across two levels: learner-to-learner; and learner-to-instructor with no instructor-to-learner instances. For example:

Social Interaction, Learner Relationships: Learner-to-Learner		
Tweet Reference: G2T84	**Learner Name:** @hiseh109751564	**Assessment**
#hiseh_teamb OK so basically we just have to read over the sites and be able to discuss those points next week yeah? We done so?		A learner makes a comment *(Social Interaction)*, in relation to the task, explaining what needs to be done for the following week's class.
In response to @hiseh109751564		
Tweet Reference: G1T85	**Learner Name:** @hiseh108498512	**Assessment**
@hiseh109751564 Sounds good		An assigned group member acknowledges the comment by responding, forming/strengthening a learner-to-learner relationship *(Learner Relationships)*.

Table A-28: An Instance of Social Interaction Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that the majority of relationships that were formed or strengthened were of a learner-to-learner type, which is expected in a collaborative learning environment. The cell based trends are presented next.

Appendix A.2.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Social Collaboration, Active Learning"*
- *"Content Sharing, Active Learning"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS3101 SMECLE.

Social Interaction, Active Learning

Social Interaction occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner discusses the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level. The rules were set as in Table A-11 in Appendix A.1.3.

With the most recorded instances of the entire class, the first trend of the *"Social Interaction, Active Learning"* cell is that there were many comments made in relation to the task by both groups, with instances occurring at both the individual level (53%), and the assigned group level (47%). This indicates that while learners were making comments in relation to the task, they were often receiving responses from their assigned group members. This led to some interesting debate in Group 2, where one learner had interpreted the task differently, suggesting that they did not need to discuss anything, but just provide links to sites that discussed their topic. This was eventually overruled by the other group members, and they began discussing the topic, as opposed to just sharing content. Group 1 had less discussion in terms of how to go about answering the task, but instead their discussion was ignited by a learner asking a question, with others adding to it.

The second trend of the *"Social Interaction, Active Learning"* cell is that when learners were acknowledging comments that were in relation to the task, they were all assigned group instances as opposed to class group, or discipline community group instances (see Figure A-2). This indicates that the two groups did not try to discuss the task with each other, but instead relied on their assigned group members.

When assigned group members made comments in relation to the task, they discussed what the task meant, how they should complete the task, and how they should provide their answer for the task. Each of the assigned groups participated in these kinds of conversations. For example:

Social Interaction, Active Learning: Assigned Group Level		
Tweet Reference: G2T64	**Learner Name:** @hiseh108498512	**Assessment**
#hiseh_teamb so must we come up with an answer to the question together on twitter??		A learner makes a comment *(Social Interaction)* in relation to the task by discussing what they must do, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @hiseh108498512		
Tweet Reference: G2T65	**Learner Name:** @hiseh103466507	**Assessment**
@hiseh108498512 #hiseh_teamb think that's for next week's discussion. i don't have much left say now		An assigned group member then acknowledges this by making a comment *(Social Interaction)*, and explains what they think they must do, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @hiseh108498512		
Tweet Reference: G2T66	**Learner Name:** @hiseh109751564	**Assessment**
@hiseh108498512 Thats the impression I got from the intructions anyway - just a tweet like as in 140 characters		Another assigned group member also acknowledges the comment *(Social Interaction)*, and responds by agreeing with them, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learners who acknowledged the comment were assigned group members, this instance occurred at the assigned group level.

Table A-29: An Instance of Social Interaction Enabling Active Learning at the Assigned Group Level

The third trend of the *"Social Interaction, Active Learning"* cell is that the majority of *Social Interaction* came in the form of learners discussing how they were supposed to complete the task. The trends across *"Social Collaboration, Active Learning"* are presented next.

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if learners ask questions of other learners, or agree/disagree with other learners, in relation to the task, and explain why, an instance of *"Social Collaboration, Active Learning"* has occurred. Depending on who asks the questions, or agrees/disagrees, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rules were set as in Table A-13 in Appendix A.1.3.

The first trend of the *"Social Collaboration, Active Learning"* cell is that when learners asked questions of each other learners, or agreed with them, they often got responses as the majority of instances occurred at the assigned group level (60%), as evidence in . This is greater than the amount of individual instances (40%) which occurred when learners did not acknowledge questions asked of them. There wasn't a single class group, or discipline community group instance.

The second trend of the *"Social Collaboration, Active Learning"* cell is that when learners did acknowledge questions that were asked, or responded to other learners who agreed with them, they were always assigned group instances (see Figure A-2). That is to say, assigned group members were answering questions, or responding to learners when they agreed with them. For example:

<table>
<tr><th colspan="3">Social Collaboration, Active Learning: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G2T47</td><td>Learner Name:
@hiseh103466507</td><td>Assessment</td></tr>
<tr><td colspan="2">#hiseh_teamb do you think doctors would approve of the sites though? reliable information/scaremongering</td><td>An assigned group member asks the other assigned group members a question (Social Collaboration) in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @hiseh103466507</td></tr>
<tr><td>Tweet Reference:
G2T48</td><td>Learner Name:
@hiseh108498512</td><td>Assessment</td></tr>
<tr><td colspan="2">@hiseh109751564 @hiseh103466507 doctors recommending sites to look at wud be the best way to go</td><td>One of the assigned group members responds by providing an answer, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the comment was an assigned group member, this instance occurred at an assigned group level.</td></tr>
</table>

Table A-30: An Instance of Social Collaboration Enabling Active Learning at the Assigned Group Level

The third trend of the *"Social Collaboration, Active Learning"* cell is that the majority of *Social Collaboration* was in the form of learners asking questions of each other, as opposed to learners agreeing, or disagreeing with each other. The trends across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are actively learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as in Table A-15 in Appendix A.1.3.

The first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in , it was mostly only beneficial at an individual level (92%). This indicates that while learners were sharing content, few assigned group members acknowledged it (8%), and there wasn't a single class group or discipline community group instance.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, they were always assigned group instances. However, there were only two of these instances, which were dwarfed in comparison to individual instances. For example:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G2T8	**Learner Name:** @hiseh108498512	**Assessment**
Right, well this is what PubMed has to say about placenta previa http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001902/ ... #hiseh_teamb		A learner shares some content, in the form of a link *(Content Sharing)*, explaining why *(Active Learning)*. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-31: An Instance of Content Sharing Enabling Active Learning at the Individual Level

The third trend of the *"Content Sharing, Active Learning"* cell is that the dominant type of content that was shared by both groups was URLs to websites, and forums, that were in relation to the condition that each group were focusing on. Interestingly, there was no occurrence of text based content being shared.

Appendix A.3 Evaluation of IS4428 Microblog Enabled CLE

As identified in Chapter 1, IS4428 is a 4th year undergraduate module titled *"Web Development for Business"*, which consisted of 30 learners (18 male, 12 female) and one instructor. The task was set by the instructor, and required each group to define what is meant by three concepts of web development: navigation, testing, and Search Engine Optimisation (SEO). A total of 299 tweets were sent for the duration of the class, and each one was analysed with the SMECLE evaluation framework, with the results presented in Figure A-3, where a number of trends were identified at three different levels: *task based, characteristic based,* and *cell based*. These are presented next.

			The #task is to define what is meant by website #navigation, #testing, and #SEO																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Microblog	**Social Media Characteristics**	Social Interaction	**33 52%**	**30 48%**			**2 100%**			**10 100%**									**29 100%**	
		Social Collaboration	**4 36%**	**6 55%**		**1 9%**	**2 67%**		**1 33%**										**7 100%**	
		Content Sharing	**105 93%**	**6 5%**	**2 2%**		**2 100%**												**11 100%**	
		User Generated Content	**9 53%**	**7 41%**		**1 6%**	**1 100%**					**1 100%**							**5 100%**	
		Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure A-3: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS4428 SMECLE

Appendix A.3.1 Task Based Trends

The task set for IS4428 was an open one, where learners had to focus on three specific topics, and decide how to define each of them. This resulted in assigned groups taking two different approaches to answering it. The first approach, and the one used by most groups, was where a learner would suggest one of the topics to define, and then all the learners in the group started sharing content in relation to that topic, and when they felt they exhausted the topic, they moved on to the next one – one learner of an assigned group observed other groups taking this approach and suggested they use it too, but they quickly changed approach. For example:

Social Interaction, Active Learning: Assigned Group Level		
Tweet Reference: G7T4	**Learner Name:** @IS4428108306567	**Assessment**
@IS4428108540632 @IS4428108376930 @IS4428108331511 Yep sounds good, so navigation eh? #IS4428G7		A learner makes a comment *(Social Interaction)* in relation to the task by suggesting the topic they should focus on, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108306567		
Tweet Reference: G7T5	**Learner Name:** @IS4428108540632	**Assessment**
@IS4428108306567 @IS4428108376930 @IS4428108331511 Gotta have some Global and Local navigation! #IS4428G7 #navigation		An assigned group member then acknowledges this by sharing content in relation to it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the comment was an assigned group member, this instance occurred at the assigned group level.

Table A-32: A learner starts the discussion on one of the topics they need to focus on

The second approach that was observed, which one group used, was a cooperative approach to defining the topics, where they divided the task between the learners in the group, and then went and defined each of their self-assigned topics. For example:

Social Interaction, Active Learning: Assigned Group Level		
Tweet Reference: G5T8	**Learner Name:** @IS4428108462402	**Assessment**
@IS4428108320918 @IS4428108485275 @IS4428108600881 #G5 So do we want to split up the work and take one of the topics each?		A learner makes a comment *(Social Interaction)* in relation to the task by suggesting that the assigned group split the task up, creating a cooperative approach, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108462402		
Tweet Reference: G5T9	**Learner Name:** @IS4428108320918	**Assessment**
@IS4428108462402 @IS4428108485275 @IS4428108600881 #g5 Yeah! Maybe splitting them is a better idea?		An assigned group member then acknowledges this agreeing with the idea, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108320918		
Tweet Reference: G5T10	**Learner Name:** @IS4428108462402	**Assessment**
@IS4428108320918 @IS4428108485275 @IS4428108600881 Well I can look up a quick one for #SEO if you're doing navigation		The first learner then responds with a comment *(Social Interaction)* by stating what topic they will focus on, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108462402, @IS4428108320918, and @IS4428108462402		
Tweet Reference: G5T11	**Learner Name:** @IS4428108600881	**Assessment**
@IS4428108320918 @IS4428108462402 @IS4428108485275 Ya let's split them, saves time!		Another assigned group member then also agrees with splitting the task up, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learners who acknowledged the comment were assigned group members, this instance occurred at the

	assigned group level.

Table A-33: Learners look to use a cooperative approach to completing the task

While most groups took the approach of defining each topic together, there was very little interaction between assigned, class, and/or discipline community groups. Instead, learners preferred to share content in relation to the topic, and then move on to the next topic. This was observed across all eight groups, including the one who took the cooperative approach, as evidenced in Figure A-3, where the majority of interactions occurred at the individual level, under the *Active Learning* characteristic. The *characteristic based trends* are presented next.

Appendix A.3.2 Characteristic Based Trends

Active Learning

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Active Learning*, with an instance occurring at each level (see Figure A-3). For example, *Active Learning* was enabled by *Social Interaction* when learners discussed how they were going to complete the task, and how they would deliver their final answers with instances occurring across two levels: individual; and assigned group; with no class group or discipline community group instances. *Active Learning* was enabled by *Social Collaboration* when learners where learners asked questions of other learners, and agreed, or sometimes disagreed, with each other, with instances occurring across three levels: individual; assigned group; and discipline community group, with no class group instances. The single discipline community group instance occurred when a learner asked a question of a community member, who responded with an answer. For example:

<table>
<tr><th colspan="3">Social Collaboration, Active Learning: Assigned Group Level</th></tr>
<tr><td>Tweet Reference:
G2T25</td><td>Learner Name:
@IS4428108453888</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108396329 @IS4428108350141 High fidelity or low fidelity?.that is the question #Testing</td><td>An assigned group member asks a question of their assigned group members (Social Collaboration) in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to @IS4428108453888</td></tr>
<tr><td>Tweet Reference:
G2T29</td><td>Learner Name:
@IS4428108396329</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108453888 @IS4428108350141 High Fidelity. Definitely.</td><td>One of the assigned group members respond by answering the question (Active Learning).</td></tr>
<tr><td colspan="3">In response to @IS4428108453888 and @IS4428108396329</td></tr>
<tr><td>Tweet Reference:
G2T32</td><td>Learner Name:
@IS4428108350141</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108396329 @IS4428108453888 Low fidelity in the earlier stages building up to high fidelity further along??</td><td>The other assigned group member then provides an answer to the question also (Active Learning).</td></tr>
<tr><td colspan="3">In response to @IS4428108350141</td></tr>
<tr><td>Tweet Reference:
G2T35</td><td>Learner Name:
@IS4428108396329</td><td>Assessment</td></tr>
<tr><td colspan="2">@IS4428108350141 @IS4428108453888 Totes</td><td>One of the other assigned group members then agrees with this, and a consensus is reached (Active Learning). As the learners who acknowledged the question were assigned group members, this instance occurred at the assigned group level.</td></tr>
</table>

Table A-34: An Instance of Social Collaboration Enabling Active Learning at the Assigned Group Level

Active Learning was also enabled by *Content Sharing* when learners were shared text based content, as well as links to different websites which were related to the topic they were to focus on for the task, with instances occurring across three levels:

individual; assigned group; and class group, with no discipline community group instances. Further, *Active Learning* was enabled by *User Generated Content* by learners when they were defining the topics for the task, where often times it was acknowledged, with instances occurring across three levels: individual; assigned group; and discipline community group, with no class group instances. For example:

User Generated Content, Active Learning: Assigned Group Level		
Tweet Reference: G5T45	**Learner Name:** @IS4428108600881	**Assessment**
@IS4428108485275 Usability is an attribute that assesses how easy user interfaces are to use. Determines success of website. #mydefinition		A learner creates some original content *(User Generated Content)* in relation to the task, by giving their own definition for one of the topics that they need to define, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108600881		
Tweet Reference: G5T47	**Learner Name:** @IS4428108485275	**Assessment**
@IS4428108600881 Sounds about right to me!		An assigned group member acknowledges the original content by agreeing with it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.

Table A-35: An Instance of User Generated Content Enabling Active Learning at the Assigned Group Level

The second trend that was observed was that that the majority of instances occurred at the individual level for all of the characteristics, except for *Social Interaction*. That is to say, when learners were trying to ask questions, share content, or generate and share original content, it was mainly only beneficial to the individual who did so, except for when they tried to discuss the task, where they would often get an answer.

However, on the instances when other learners did acknowledge any of the other interactions, it was mainly at the assigned group level, with only a total of two instances occurring at the class group level, and two instances occurring at the discipline community group level (see Figure A-3). The trends across *Group Participation* are presented next.

Group Participation

The first trend across the *Group Participation* cells is that it was almost non-existent in the class, with a total of eight instances occurring, despite the majority of the groups taking a somewhat collaborative approach to solving the task. This is not what would be expected in a collaborative learning environment, as learners are expected to be involved in discussions about the task that would span more than two interactions. However, in the IS4428 SMECLE, it was observed that learners did not engage in such discussions, instead they mainly only lasted for two interactions.

The second trend across the *Group Participation* cells is that four of the social media characteristics (*Social Interaction*, *Social Collaboration*, *Content Sharing*, and *User Generated Content*) enabled *Group Participation*, where the majority of instances were at the assigned group level, except for a single discipline community group instance (see Figure A-3). For example, *Group Participation* was enabled by *Social Interaction* twice when learners discussed the task, which occurred at the assigned group level, with no class group, or discipline community group instances. *Group Participation* was enabled by *Content Sharing* twice when text based content was shared, and another learner acknowledged it, which was further acknowledged again, which occurred at the assigned group level, with no class group, or discipline community group instances. *Group Participation* was enabled by *User Generated Content* once when a learner provided their own definition for a topic, and an assigned group member acknowledged it, which was further acknowledged again, so it occurred at the assigned group level, with no class group, or discipline community group instances. *Social Collaboration* enabled the highest amount of *Group Participation* instances, with a total of three, which occurred at the assigned group level, and discipline community group level, with no class group instances. For example:

Social Collaboration, Group Participation: Discipline Community Group Level		
Tweet Reference: G4T25	**Learner Name:** @IS4428108595178	**Assessment**
@theolynn What are your opinions on the importance of website #testing and how to improve your website #navigation and #SEO? #IS4428G4		A learner asks a question of someone from outside the class group *(Social Collaboration)* who is a lecturer in e-business and digital marketing, in relation to the task.
In response to @IS4428108595178		
Tweet Reference: G4T47	**Learner Name:** @theolynn	**Assessment**
@IS4428108595178 Whats the story with these bizarre twitter handles? Website usability, HCI and ecommerce optimisation essential		The discipline community group member acknowledges this by answering the question *(Group Participation)*.
In response to @theolynn		
Tweet Reference:	**Learner Name:** @IS4428108595178	**Assessment**
@theolynn we're having an experimental class over twitter...class code + student number! @IS4428104468261 brainchild. Thanks theo!!		The learner then thanks them for their answer, and answers the question they asked *(Group Participation)*. As the learner who acknowledged the question was a discipline community group member, this instance occurred at the discipline community group level.

Table A-36: An Instance of Social Collaboration Enabling Group Participation at the Assigned Group Level

Following the trends that have been identified across *Group Participation*, the trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

The first trend across the *Roll of the Instructor* cells is that there are only a few instances, with a total of eleven, which indicates that the instructor portrayed their role how it is expected. They generated the task, and provided it to the class at the beginning. They then took a step back, and allowed the learners to drive the discussion, and were ready for when learners required any guidance. This resulted in two of the social media characteristics enabling *Role of the Instructor*, with instances at two of the four levels. For example, *Role of the Instructor* was enabled by *User Generated Content* when the instructor created the task, and shared it with the class group, with the instance occurring at the class group level as learners acknowledged it by trying to complete it, and it was also retweeted by some. *Role of the Instructor* was also enabled by *Social Interaction* when the instructor tried to discuss some things with the class, like suggesting Twitter as a source of information for learners but since no one acknowledged these, each one occurred at an individual level, with no assigned group, class group, or discipline community group instances. For example:

Social Interaction, Role of the Instructor: Individual Level		
Tweet Reference: I1T10	**Learner Name:** @IS4428104468261	**Assessment**
Don't forget #twitter itself is a great source for information. You can #communicate with many (even experts), by asking questions!!!		The instructor tries to provide some guidance to the class group *Role of the Instructor)* in relation to the task, explaining where they can try get some information. As no other learner acknowledged the comment, the instance occurred at the individual level.

Table A-37: An Instance of Social Interaction Enabling Role of the Instructor at the Individual Level

Following the trends that have been identified across *Role of the Instructor*, the trends observed across *Learner Diversity* are presented next.

Learner Diversity

The trend across *Learner Diversity* is that there wasn't a single instance of a social media characteristic enabling *Learner Diversity* (see Figure A-3). That is to say, when a learner shared content, asked questions, or gave their opinion, on no occasion did they explicitly draw on their backgrounds when doing so. This could potentially be due to the character limit set by Twitter, forcing learners to be very precise when sending a tweet. The trends observed across *Learner Relationships* are presented next.

Learner Relationships

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, but not at all the levels (see Figure A-3). For example, *Learner Relationships* were enabled by *Social Interaction* when learners discussed the task, with instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. *Learner Relationships* were enabled by *Social Collaboration* when learners asked questions and got responses by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content, that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. Finally, *Learner Relationships* were enabled by *Content Sharing* when learners shared content that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. For example:

Content Sharing, Learner Relationships: Learner-to-Learner		
Tweet Reference: G2T30	**Learner Name:** @IS4428108453888	**Assessment**
@IS4428108350141 @IS4428108396329 websites such as http://www.webpagetest.org/ can also be used #Testing		A learner shares some content in the form of a link *(Content Sharing)*, and explains why.
In response to @IS4428108453888		
Tweet Reference: G2T31	**Learner Name:** @IS4428108396329	**Assessment**
@IS4428108453888 @IS4428108350141 very good. Here is a handy definition also http://support.google.com/webmasters/bin/answer.py?hl=en&answer=35291		An assigned group member acknowledges the content that was shared, forming/strengthening a learner-to-learner relationship *(Learner Relationships)*.

Table A-38: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that the majority of relationships that were formed or strengthened were of a learner-to-learner type, which is expected in a collaborative learning environment. The cell based trends are presented next.

Appendix A.3.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Content Sharing, Active Learning"*
- *"User Generated Content, Active Learning"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS4428 SMECLE.

Social Interaction, Active Learning

Social Interaction occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner discusses the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level. The rules were set as in Table A-11 in Appendix A.1.3.

The first trend of the *"Social Interaction, Active Learning"* cell is that there were many comments made in relation to the task by the groups, with instances occurring at both the individual level (52%), and the assigned group level (48%). This indicates that while learners were making comments in relation to the task, they were often receiving responses from their assigned group members.

The second trend of the *"Social Interaction, Active Learning"* cell is that when learners were acknowledging comments that were in relation to the task, they were all assigned group instances as opposed to class group, or discipline community group instances (see Figure A-3). This indicates that the two groups did not try to discuss the task with each other, but instead relied on their assigned group members. When assigned group members made comments in relation to the task, they discussed how they were supposed to do the task, stated when they were moving on to the next topic of the task, and towards the end how they were supposed to present their answer. Each of the assigned groups participated in these kinds of conversations. For example:

Social Interaction, Active Learning: Assigned Group Level		
Tweet Reference: G4T15	**Learner Name:** @IS4428108596956	**Assessment**
Movng on to #SEO? #IS4428G4		A learner makes a comment *(Social Interaction)* in relation to the task, suggesting to the group that they should move on to the next topic in the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to @IS4428108596956		
Tweet Reference: G4T16	**Learner Name:** @IS4428107433115	**Assessment**
@IS4428108596956 #SEO it is. #IS4428G4		An assigned group member then acknowledges this by making a comment *(Social Interaction)*, and they moved on to the next topic, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the comment was an assigned group member, this instance occurred at the assigned group level.

Table A-39: An Instance of Social Interaction Enabling Active Learning at the Assigned Group Level

The third trend of the *"Social Interaction, Active Learning"* cell is that the majority of *Social Interaction* came in the form of learners discussing when they were going to move on to the next topic. The trends across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are Actively Learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as in Table A-15 in section Appendix A.1.3.

With the most recorded instances of the entire class, the first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in , it was mostly only beneficial at an individual level (93%). This indicates that while learners were sharing content, few assigned group members acknowledged it (5%), even less class group members (2%), and there wasn't a single discipline community group instance.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, it was not always an assigned group instance (six in total), but on two occasions it was a class group instance (see Figure A-3). The two class group instances involved learners acknowledging content that was shared by other class group members by retweeting it, while the assigned group instances involved assigned group members ackn0owldeing content that was shared by responding to it. For example:

Content Sharing, Active Learning: Individual Level		
Tweet Reference: G5T39	**Learner Name:** @IS4428108600881	**Assessment**
@IS4428108485275 @IS4428108320918 @IS4428108462402 Nielsen: usability has 5 parts:Learnability,Efficiency,Memorability, Errors,Satisfaction		A learner shares some content, in the form of text *(Content Sharing)*, explaining why *(Active Learning)*, but no other learner acknowledges it so the instance occurred at an individual level. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-40: An Instance of Content Sharing Enabling Active Learning at the Individual Level

The third trend of the *"Content Sharing, Active Learning"* cell is that the dominant type of content that was shared was in the form of text, where learners offered information already know on a specific concept but rarely gave a source, or provided quotes from a source. The second most dominant type of content shared was in the form of URLs, with learners linking to different types of content such as video, PDFs, and images. This would be expected on a microblogging platform, as you cannot embed content into tweets. The trends across *"User Generated Content, Active Learning"* are presented next.

User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are Actively Learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have actively learned from it. The rule was set as follows:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Active Learning (4.1.2)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.3)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.4)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table A-41: Cell Rules for User Generated Content, Active Learning

The first trend of the *"User Generated Content, Active Learning"* cell is that when users created and shared some original content, it was beneficial on three of the four levels: individual (53%); assigned group (41%); and discipline community group (6%). This indicates that the original content that was being shared was often beneficial to not just the individual who created it, but to other learners also.

The second trend of the *"User Generated Content, Active Learning"* cell is that when learners did generate and share some original content, and it was acknowledged, the majority of the time they were assigned group instances (see Figure A-3). While there was a single discipline community group instance, which consisted of a response from a community member, the six assigned group instances consisted of learners acknowledging the original content by agreeing with it. For example:

User Generated Content, Active Learning: Individual Level		
Tweet Reference: G3T24	**Learner Name:** @IS4428108663726	**Assessment**
each page should have a good nav and offer consistant paths,must be logical, flexible and obvious to be useful,Crumbtrails are a must#nav		A learner creates and shares some original content *(User Generated Content)* by providing a definition for a topic. As no other learner acknowledged the content, the instance occurred at the individual level.

Table A-42: An Instance of User Generated Content Enabling Active Learning at the Individual Level

The third trend of the *"User Generated Content, Active Learning"* cell is that all of the content that was generated by learners was in the form of text, when they gave their opinion, or when creating their own definitions for the task. There was no instance of learners generating any other type of content such as a video, or an image.

Appendix B Evaluation of Blog Enabled CLEs

Appendix B.1 Evaluation of IS2200 Blog Enabled CLE

As identified in Chapter 1, IS2200 is a 2nd year undergraduate module titled "*Business Systems Analysis and Design"*, which consisted of 178 learners (95 male, 83 female) and one instructor. The task was set by the instructor, and required each group, of which there were forty-five, to write a blog post each week on their assigned topic, for six weeks. They were also required to comment on other learner's posts. A total of 809 blog posts were created and 1623 comments were made. This activity was analysed with the SMECLE evaluation framework, with the results presented in Figure B-1, where a number of trends were identified at three different levels: *task based*, *characteristic based*, and *cell based*. These are presented next.

Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.

Collaborative Learning Characteristics

			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Blog	**Social Media Characteristics**	Social Interaction	**235 77%**	**14 4%**	**56 18%**			**1 100%**		**3 21%**	**11 79%**			**2 67%**		**1 33%**		**9 12%**	**64 85%**	**2 3%**
		Social Collaboration	**56 45%**	**17 14%**	**52 42%**		**3 23%**	**10 77%**		**1 100%**								**1 1%**	**67 99%**	
		Content Sharing	**846 70%**	**73 6%**	**294 24%**		**25 28%**	**64 71%**	**1 1%**										**377 100%**	
		User Generated Content	**64 65%**	**7 7%**	**27 28%**					**3 43%**		**4 57%**		**1 100%**					**14 100%**	
		Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure B-1: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS2200 SMECLE

Appendix B.1.1 Task Based Trends

The task set for IS2200 was an open one, as it gave learners the opportunity to discuss their assigned topic from any perspective that they wished to, and it allowed them to comment on any other learner’s blogs. The majority of the assigned groups took the same approach to solving the task, where they began writing blog posts on their topic, and then commenting on other learner’s blog posts. There was little evidence of learners discussing how they were going to complete the task, perhaps a limitation of the blogging platform, as it did not provide any features to support this type of discussion. Instead, it was observed that learners were writing blog posts on their own, without consulting their assigned group members. That is to say, learners were rarely acting in a collaborative manner in terms of building on each other’s blog posts, but were instead, as individuals, deciding on what to blog about, which sometimes resulted in learners of an assigned group creating blog posts that were very similar, duplicating thee work effort, which results in wasting time, and reducing the quality of work. For example:

Blog Reference: G1B3	**Learner Name:** sad109417338	**Assessment**
Types of Flowcharts		This was a title of a blog post from a learner, where they discussed the different types of flowcharts available.

Table B-1: A learner writes a blog post about the types of flowcharts available

The very next blog post that was written by another assigned group member was similar in the approach that they took:

Blog Reference: G1B4	**Learner Name:** sad109566511	**Assessment**
Flowcharts & DFD's: the different types		This is the title of the next blog post that was written, where the title, and content, is quite similar, where they are discussing the different types of flowcharts, although in this case they also discuss the different types of DFDs.

Table B-2: A learner writes a blog post about the types of flowcharts and DFDs available

However, there were also instances where learners were motivated by what other assigned group members, or class group members, had blogged about, which resulted in them creating a blog post that was building on what others had done, or taking that perspective and applying it to their own topic. This is a much more collaborative approach, where learners are not randomly creating blog posts on a topic, but instead trying to build on each other's contributions. For example:

Blog Reference: G5B6	**Learner Name:** sad111303111	**Assessment**
Following on from a very interesting post by one of my group members about the characteristics of SCRUM and its advantages, I will now show how SCRUM can be useful in an everyday environment in solving real problems and meeting real deadlines. As my fellow group member already outlined some of the key advantages of SCRUM are its increased productivity, increased vision of progress and reduced risk which would sound good to anyone.		A learner clearly outlines at the start of their blog post that they are building on what another assigned group member had blogged about.

Table B-3: Learners take a collaborative approach to completing the task

It was also observed that because assigned group members were taking their own perspectives on their assigned topic, often blog posts did not crossover with other assigned group members blog posts. For example, one learner had the topic of *"What* *is the Role of a Systems Analyst"*, and while they wrote a generic introduction blog, they followed this up by writing a blog post that focused on what recruitment agencies had been advertising for such a role. In their next blog they interviewed someone they knew in an organisation that worked as a systems analyst, and they wrote about what they said their role was. Their fourth blog then compared and contrasted what the recruitment agencies were looking for, and what a real life systems analyst was actually doing. In this instance, the learner took their own perspective on the task, and wrote blog posts that were very different to their assigned group members, with little crossover, so each learners blog posts were still unique.

There was also the a trend of learners leaving comments that did not indicate they had read, or understood a blog post, but instead was an attempt to get marks for little effort. For example, learners were leaving comments such as *"well done"*, *"I enjoyed this blog"*, and *"very informative blog"*, instead of actually leaving some engaging comments about a blog post. The *characteristic based trends* are presented next.

Appendix B.1.2 Characteristic Based Trends

Active Learning

Active Learning occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. This can be enabled by any of the social media characteristics, from discussing the task (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners (*Social Collaboration*), sharing some content, (*Content Sharing*), and generating some content, and sharing it (*User Generated Content*). Depending on who acknowledges it, *Active Learning* can be enabled at different levels: individual; assigned Group; class group; and/or discipline community group.

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction*, *Social Collaboration*, *Content Sharing, and User Generated Content*) characteristics enabled *Active Learning*, with instances at three of the four levels: individual; assigned group; and class group, with no discipline community group instances (see Figure B-1). For example *Active Learning* was enabled by *Social Interaction* when learners left comments on other learner's blogs stating how the blog post was informative; that it had helped them to learn about a topic; that it will be useful for their exams; and explaining how it gave them some ideas for their own future blogs, with instances occurring across three levels: individual; assigned group; and class group; with no discipline community group instances. *Active Learning* was also enabled by *Social Collaboration*, where learners asked questions of other learners, either based on their blog posts, or based on comments on their blog posts, or also agreed with other learners, with instances occurring across three levels: individual; assigned group; and class group; with no discipline community group instances. For example:

Social Collaboration, Active Learning: Class Group Level		
Blog Reference: G35B13	**Learner Name:** sad111346076	**Assessment**
Very informative blog. What type of conflict do you think is most detrimental to a project?		A class group member asks another class group member a question *(Social Collaboration)* in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111346076		
Blog Reference: G35B13	**Learner Name:** sad111490988	**Assessment**
Personally I believe waiting on tasks to be completed is the most detrimental type of conflict for a project team. When people are not pulling their weight in the project it can become very irritating and detrimental for the completion of the project.		The other class group member acknowledges this question, and responds by giving their opinion, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the question was a class group member, this instance occurred at the class group level.

Table B-4: An Instance of Social Collaboration Enabling Active Learning at the Class Group Level

Active Learning was also enabled by *User Generated Content* by learners giving their opinion to a discussion in relation to the task, with instances occurring across three levels: individual; assigned group; and class group; with no discipline community group instances. Further, *Active Learning* was enabled by *Content Sharing* when learners shared content, which mainly occurred when they wrote a blog post, with instances occurring across the three levels: individual; assigned group; and class group; with no discipline community group instances. For example:

<table>
<tr><th colspan="3">Content Sharing, Active Learning: Assigned Group Level</th></tr>
<tr><td>Blog Reference:
G32B6</td><td>Learner Name:
sad111463042</td><td>Assessment</td></tr>
<tr><td colspan="2">How to make a flowchart?

Flowcharts are hard enough to explain to a person with physically being in contact with the other person yor are trying to show.

So look at this very good video on how to make a flowchart using microsoft visio</td><td>A learner shares some content in the form of a video (Content Sharing) in relation to the task, explaining why, indicating they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to sad111463042</td></tr>
<tr><td>Blog Reference:
G32B6</td><td>Learner Name:
sad111468572</td><td>Assessment</td></tr>
<tr><td colspan="2">well done group member, the video really helps the process</td><td>An assigned group member acknowledges this content by commenting on it, showing they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was an assigned group member, this instance occurred at the assigned group level.</td></tr>
</table>

Table B-5: An Instance of Content Sharing Enabling Active Learning at the Assigned Group Level

The second trend that was observed was that that the majority of instances occurred at the individual level for all of the characteristics, except for *Social Collaboration*. That is to say, when learners were trying to discuss the task, share content, or generate and share original content, it was often only beneficial to the individual who did so, except for when they asked questions, or agreed with other learners, where they would often get an acknowledgement. However, on the instances when other learners did acknowledge any interactions, it was mainly at the class group level, where learners from the class group were more likely to interact instead of assigned group members (see Figure B-1). This indicates that, learners were engaging more with class group members, as opposed to their own assigned group members. The trends across *Group Participation* are presented next.

Group Participation

Group Participation occurs when learners ask questions, justify opinions, listen to others, and through negotiation, reach a consensual answer. This can be enabled by any of the social media characteristics, from discussing the task, and getting a response from a group member, which gets a further response (*Social Interaction*), asking a question(s), or agreeing/disagreeing with other learners, and getting a response from a group member, which gets a further response (*Social Collaboration*), sharing some content, and having it acknowledged, which gets a further response (*Content Sharing*), and generating some content, sharing it, having it acknowledged, which gets a further response (*User Generated Content*). Depending on who acknowledges it, *Group Participation* can be enabled at different levels: assigned group; class group; and/or discipline community group.

The first trend across the *Group Participation* cells is that three of the social media characteristics (*Social Interaction, Social Collaboration,* and *Content Sharing*) enabled *Group Participation*, with instances observed at all the levels (see Figure B-1). For example, there was a single instance where *Group Participation* was enabled by *Social Interaction*, which was at the class group level, and occurred when a learner commented on how they liked an example that was provided by a blogger, to which the blogger replied and suggested other areas they should look at, which again got a response from the initial commenter. *Group Participation* was also enabled by *Social Collaboration* when learners asked questions of other learners, and got a response, which was further acknowledged, but at no occasion did a learner agree/disagree with another learner to enable *Group Participation*. These occurred both at the assigned group, and class group levels, with no discipline community group instance. For example:

Social Collaboration, Group Participation: Class Group Level		
Blog Reference: G38B1	**Learner Name:** sad111526987	**Assessment**
We all know that in the majority of cases failure in information systems can be traced back to human error, eg. design failure, operational errors, management failures…What do you think would be the best way to reduce human error and failure in information systems?		A learner decides to write a blog post, but instead of discussing too much, they ask a question of other learners *(Social Collaboration).*
In response to sad111526987		
Blog Reference: G38B1	**Learner Name:** sad112712305	**Assessment**
I would say a clear overview of goals to be achieved would be the first step towards reducing system failures. Regarding human errors – building a good useful Information System. What do you think about it?		A class group member acknowledges this by answering the question *(Group Participation).*
In response to sad112712305		
Blog Reference: G38B1	**Learner Name:** sad111330736	**Assessment**
I think the same, that not establishing their goals would lead to many of the failures and by having their goals clear would help[to minimise the errors in information systems! Also miscommunication would be a factor that would lead to many errors so by improving on communication within an organisation would also help to reduce the errors in an information system.		Another class group member acknowledges the previous comment, and also adds to their answer *(Group Participation).*
In response to sad111330736		
Blog Reference: G38B1	**Learner Name:** sad111708665	**Assessment**
…Communication is so often an issue when it comes to the mechanics of any entity; I guess its the same for IS!? Proper and regular communication should ensure that failures are kept to a minimum, but as you said…it does come down to human error…		A third class group member also responds, and agrees with the previous comment, and explains why *(Group Participation).* As this participation was between class group members, this instance occurred at the class group level.

Table B-6: An Instance of Social Collaboration Enabling Group Participation at the Class Group Level

Group Participation was also enabled by *Content Sharing*, mainly when learners shared content in the form of images, text, or video, which were acknowledged by another learner, which got further acknowledged, with instances occurring across all three levels: assigned group; class group; and discipline community group. Interestingly, the only instance of a discipline community group activity in the IS2200 SMECLE occurred here, where a member commented on a blog post by a learner, who responded to it. For example:

<table>
<tr><th colspan="3">Content Sharing, Group Participation: Discipline Community Group Level</th></tr>
<tr><td>Blog Reference:
G40B6</td><td>Learner Name:
sad111548123</td><td>Assessment</td></tr>
<tr><td colspan="2">Information should be relevant in order for an organisation to get the maximum value that it can from the information provided. The Oxford dictionary provides the following definition: something relevant is closely connected or appropriate to the matter in hand.</td><td>A learner shares content in the form of text (Content Sharing) in relation to the task, from the Oxford dictionary, and also a link to a website.</td></tr>
<tr><td colspan="3">In response to sad111562473</td></tr>
<tr><td>Blog Reference:
G40B6</td><td>Learner Name:
Complete IT Pro (@complete_it_pro)</td><td>Assessment</td></tr>
<tr><td colspan="2">Thanks for the link to my site! I’ve read a few of your articles now and they’re pretty good – I’ll keep coming back!
Ben</td><td>A discipline community group member, who is the author of the website that the learner linked to responds to the link, thanking them for it, and provides some feedback on their other posts (Group Participation).</td></tr>
<tr><td colspan="3">In response to Complete IT Pro (@complete_it_pro)</td></tr>
<tr><td>Blog Reference:
G40B6</td><td>Learner Name:
sad111548123</td><td>Assessment</td></tr>
<tr><td colspan="2">Thanks for your comment Ben. Your website is a very useful resource!</td><td>The learner acknowledges the comment by responding to it, thanking them (Group Participation). As the learner who acknowledged the content was discipline community group member, this instance occurred at the discipline community group level.</td></tr>
</table>

Table B-7: An Instance of Content Sharing Enabling Group Participation at the Discipline Community Group Level

The second trend that was observed was that that the majority of instances occurred at the class group level for all of the characteristics. That is to say, when learners were contributing to a discussion that resulted in more than two interactions, it was mainly class group members that were doing so, as opposed to assigned group members (see Figure B-1). The trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

Role of the Instructor is to provide a task to be completed, and offer qualified guidance when required. This can be enabled by any of the social media characteristics, from discussing the task *(Social Interaction)*, asking a question(s), or agreeing/disagreeing with other learners *(Social Collaboration)*, sharing some content, *(Content Sharing)*, and generating some content, and sharing it, *(User Generated Content)*. Depending on who acknowledges it, the *Role of the Instructor* can be enabled at different levels: individual; assigned group; class group; and/or discipline community group for *Social Interaction* and *User Generated Content*, while *Social Collaboration* and *Content Sharing* do not have these levels due to a lack of data.

The first trend across the *Role of the Instructor* cells is that there are only a few instances, with a total of 22 instances, which indicates that the instructor portrayed their role how it is expected. They generated the task, and provided it to the class at the beginning. They then took a step back, and allowed the learners to drive the discussion, and were ready for when learners required any guidance. This resulted in three of the social media characteristics enabling the *Role of the Instructor*, with instances at three of the four levels. For example, the *Role of the Instructor* was enabled by *Social Interaction* when the instructor had to tell learners to categorise their blog post, where they most often obliged, with instances occurring at the individual and assigned group levels, with no class group, or discipline community group instances. *Role of the Instructor* was also enabled by *User Generated Content* when they provided the task to the class, and other information such as the groups, and their topics, with instances occurring at the individual class group levels, with no assigned group, or discipline community group levels. There was also a single instance of *Social Collaboration* enabling *Role of the Instructor*, where a learner created a blog post, and the instructor asked them where they had got some of the figures they used in their blog post, and they responded. For example:

Social Collaboration, Role of the Instructor: Assigned Group Level		
Blog Reference: G20B1	**Learner Name:** instructorcathaldoyle	**Assessment**
My only question here would be do you have any link to where you have got some of these figures?		The instructor asks a question of a learner *(Social Collaboration)* in relation to some stats they provided in their blog post, guiding them towards providing some evidence *(Role of the Instructor)*.
In response to instructorcathaldoyle		
Tweet Reference: G20B1	**Learner Name:** sad111413042	**Assessment**
I got them from your lecture 2 slides, "What is an Information System?", slide 24 :)		The learner acknowledges the question by responding, indicating they got them from lecture slides of the instructor. As the learner who acknowledged the question was an assigned group member, this instance occurred at the assigned group level.

Table B-8: An Instance of Social Collaboration Enabling Role of the Instructor at the Assigned Group Level

Following the trends that have been identified across *Role of the Instructor*, the trends observed across *Learner Diversity* are presented next.

Learner Diversity

Learner Diversity occurs when a learner can draw on their background to provide different perspectives on task-related information. This can be enabled by any of the social media characteristics, from discussing the task, drawing on their background *(Social Interaction)*, asking a question(s), or agreeing/disagreeing with other learners, drawing on their background *(Social Collaboration)*, sharing some content, drawing on their background *(Content Sharing)*, and generating some content, and sharing it, drawing on their background *(User Generated Content)*. Depending on who acknowledges it, *Learner Diversity* can be enabled at different levels: individual; assigned group; class group; and/or discipline community group for both *Social Interaction*, and *User Generated Content*, while *Social Collaboration* and *Content Sharing* do not have these levels due to a lack of data.

The first trend across *Learner Diversity* is that two of the social characteristics (*Social Interaction*, and *User Generated Content*) enabled *Learner Diversity,* with instances at two of the four levels: individual; and class group, with no assigned group, or discipline community group instances (see Figure B-1). For example *Learner Diversity* was enabled by *Social Interaction* on four occasions, where each one resulted in a learner discussing the task, and drawing on their background when doing so, with instances observed at both the individual, and class group levels, with no assigned group, or discipline community group instances. For example:

Social Interaction, Learner Diversity: Class Group Level		
Blog Reference: G40B12	**Learner Name:** sad112540853	**Assessment**
Really interesting blog, you are absolutely when it comes to what people these do, when we see something like a bump or anything we check it out on the internet straight away, sometimes get carried away with what we find but at least we can check it out. I work in the hospital and i would see the doctors checking out conditions on the internet everyday and printing out what the conditions mean so that families can read into it more and become more aware of the situation. Excellent Blog and thanks for the links, they were very helpful :D		A learner makes a comment *(Social Interaction)* on another learner's blog post, where they are discussing the task, and provide an example from their own lives *(Learner Diversity).*
In response to sad112540853		
Blog Reference: G40B12	**Learner Name:** sad111548123	**Assessment**
Thanks for your comment. Glad the links helped too!		The comment is acknowledged by the learner who wrote the blog post, who is a class group member. As the learner who acknowledged the comment was a class group member, this instance occurred at the class group level.

Table B-9: An Instance of Social Interaction Enabling Learner Diversity at a Class Group Level

Learner Diversity was also enabled by *User Generated* Content on a single occasion, when a learner provided a detailed account of a system that they are using in their own organisation when making a comment on another learner's blog, which occurred at the individual level. For example:

User Generated Content, Learner Diversity: Individual Level		
Blog Reference: G45B12	**Learner Name:** sad112425878	**Assessment**
A lot of companies use this kind of information systems. The company that i work for use it they are Quish's Supervalu, Ballincollig. They are a retail company who heavily depend on sales. At the the moment we are seeing a decline in sales, which have lead to our hours being cut. This then could lead to a loss of jobs. The data that is received from this system helps them make there decision.		A learner creates and shares some original content *(User Generated Content)* by giving a give a real world example of the system that a class group member has blogged bout, and its impacts on the workers *(Learner Diversity)*. As no other learner acknowledged the content, the instance occurred at the individual level.

Table B-10: An Instance of User Generated Content Enabling Learner Diversity at the Individual Level

Following the trends that have been identified across *Learner Diversity*, the trends observed across *Learner Relationships* are presented next.

Learner Relationships

A *Learner Relationship* occurs from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. This can be enabled by any of the social media characteristics, from discussing the task, and getting an acknowledgement *(Social Interaction)*, asking a question(s), or agreeing/disagreeing with other learners, and getting an acknowledgement *(Social Collaboration)*, sharing some content, and getting an acknowledgement *(Content Sharing)*, and generating some content, and sharing it, and getting an acknowledgement *(User Generated Content)*. Depending on who acknowledges it, the *Learner Relationship* can occur at three different levels: Instructor-to-Learner, Learner-to-Learner, and Learner-to-Instructor. It is expected in a CLE that the majority of relationships that get formed or strengthened would be learner-to-learner, as it should be learners interacting with each other, and only receiving guidance when required from the instructor.

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User*

Generated Content) enabled *Learner Relationships*, but not at all the levels (see Figure B-1). For example, *Learner Relationships* were enabled by *Social Interaction* when learners discussed topics in relation to the task, when the instructor provided guidance to learners, and they acknowledged it, and on two occasions when learners provided information for the instructor, and they acknowledged it. Instances occurred across all three levels: instructor-to-learner; learner-to-learner; and learner-to-instructor. *Learner Relationships* were enabled by *Social Collaboration* when learners asked questions and received responses from other learners, or agreed with each other, and on a single occasion when the instructor asked a question of a learner who responded. Instances occurred across two levels: instructor-to-learner; and learner-to-learner; with no learner-to-instructor instances. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content, that was acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. Finally, *Content Sharing* also enabled *Learner Relationships* when learners shared content that was acknowledged by other learners, with all the instances occurring across one level: learner-to-learner; with no instructor-to-learner, or learner-to-instructor instances. For example:

Content Sharing, Learner Relationships: Learner-to-Learner		
Blog Reference: G45B17	**Learner Name:** sad112759089	**Assessment**
One luxury system I will be talking about is the Savant's Smart Systems which is an engineered technique that allows for future home control upgrades which lets us have an easier life. The system is designed to deliver an extraordinary level of simplicity and efficiency, allowing one to have a streamlined smart home.		A learner shares some content in the form of text, explaining the system they are going to discuss *(Content Sharing).*
In response to sad112759089		
Blog Reference: G45B17	**Learner Name:** sad111383486	**Assessment**
Really interesting and unusual blog topic; the systems you talked about sound fantastic! But they sound so high-tech, would they not be extremely expensive and way out of the average person's price range?		A class group member acknowledges the content that was shared by responding, forming/strengthening a learner-to-learner relationship *(Learner Relationships).*

Table B-11: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that the majority of relationships that were formed or strengthened were of a learner-to-learner type, which is expected in a collaborative learning environment. The cell based trends are presented next.

Appendix B.1.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Content Sharing, Active Learning"*
- *"Content Sharing ,Learner Relationships"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS2200 SMECLE.

Social Interaction, Active Learning

Social Interaction occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner discusses the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level. The rules were set as follows (see Table B-12):

Cell	Level	Rules
Social Interaction, Active Learning (1.1.1)	Individual	A learner makes a comment in relation to the task, but no group member acknowledges it.
Social Interaction, Active Learning (1.1.2)	Assigned Group	A learner makes a comment in relation to the task, and at least one assigned group member acknowledges it.
Social Interaction, Active Learning (1.1.3)	Class Group	A learner makes a comment in relation to the task, and at least one class group member acknowledges it.
Social Interaction, Active Learning (1.1.4)	Discipline Community Group	A learner makes a comment in relation to the task, and at least one discipline community member acknowledges it.

Table B-12: Cell Rules for Social Interaction, Active Learning

The first trend of the *"Social Interaction, Active Learning"* cell is that while there were many comments in relation to the task made by learners as evidenced in , the majority of these occurred at the individual level (77%). This indicates that while learners were making comments in relation to the task, few assigned, or class group members were responding to them, as evidenced by the low counts of instances, which are 4% and 18%, respectively, and there wasn't a single discipline community group instance.

The second trend of the *"Social Interaction, Active Learning"* cell is that when learners were acknowledging comments that were in relation to the task, they were mostly class group instances as opposed to assigned group instances (see Figure B-1). That is to say, when discussing different topics, the majority of the discussion involved learners that were not of the same assigned group, but instead consisted of learners going to other assigned groups and leaving comments. For example:

<table>
<tr><th colspan="3">Social Interaction, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G23B4</td><td>Learner Name:
sad111424152</td><td>Assessment</td></tr>
<tr><td colspan="2">As promised, in this blog I will focus on the four methods of Agile Software Development. They are as follows; XP (Extreme Programming), Scrum, Lean and Kanban.</td><td>A learner makes a comment (Social Interaction) in relation to the task by explaining what they are going to discuss, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to sad111424152</td></tr>
<tr><td>Blog Reference:
G23B4</td><td>Learner Name:
sad111419882</td><td>Assessment</td></tr>
<tr><td colspan="2">Great blog…I liked how to made descriptive comparasions between the Agille Software development. My personal favourite is one is the value focus Lean</td><td>A class group member acknowledges this by making a comment (Social Interaction) in relation to the task, where they explain how they liked the post, and give their personal favourite method. As the learner who acknowledged the comment was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-13: An Instance of Social Interaction Enabling Active Learning at the Class Group Level

Following the trends that have been identified across *"Social Interaction, Active Learning"*, the trends observed across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are actively learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as follows (see Table B-14):

Cell	Level	Rules
Content Sharing, Active Learning (4.1.1)	Individual	A learner shares content (text, video, image, or link) in relation to the task, and shows their understanding of it, but no group member acknowledges it.
Content Sharing, Active Learning (4.1.2)	Assigned Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one assigned group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.3)	Class Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one class group member acknowledges it, and shows their understanding of it.
Content Sharing, Active Learning (4.1.4)	Discipline Community Group	A learner shares content (text, video, image, or link) in relation to the task, showing their understanding of it, and at least one discipline community group member acknowledges it, and shows their understanding of it.

Table B-14: Cell Rules for Content Sharing, Active Learning

With the most recorded instances of the entire class, the first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in Figure B-1, it was mostly only beneficial at an individual level, as a high proportion of the content that was shared was not acknowledged (70%). This indicates that while learners were sharing content, few assigned group members acknowledged it (6%), however there was a high count of class group instances (24%), but no discipline community group instances.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, they were mainly class group instances, as opposed to assigned group, or discipline community group instances (see Figure B-1), where learners were going to other learner's blog posts, and acknowledging the content that was shared on them. For example:

Content Sharing, Active Learning: Class Group Level		
Blog Reference: G36B5	**Learner Name:** sad111510567	**Assessment**
After discussing the advantages of outsourcing I will now address the problems involved with outsourcing information systems.		A learner shares some content, in the form of text *(Content Sharing)*, where they explain the problems with outsourcing, and provide a reference, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to sad111510567		
Blog Reference: G36B5	**Learner Name:** sad111413042	**Assessment**
I never realised how many problems are associated with outsourcing, from what articles I have read on the subject I always thought it was the best option. Glad somebody is giving us a honest opinion on it!! I take it you are against outsourcing yourself?		A class group member acknowledges this shared content by leaving a comment, and showing they have learned something that they hadn't known before, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.

Table B-15: An Instance of Content Sharing Enabling Active Learning at the Class Group Level

The third trend of the *"Content Sharing, Active Learning"* cell is that there was no single dominant type of content shared, as learners generally shared a mixture of content both in their blog posts, and sometimes when they were leaving comments on other blog posts. This included embedding videos, and images to their blog posts, and providing links, or references to articles they used, which was also observed to occur when learners were leaving comments. The trends across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Learner Relationships

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Learner Relationships* occur from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is that if a learner or the instructor shares some content, and it is acknowledged, a relationship is formed or strengthened between the learners, and an instance of *"Content Sharing, Learner Relationships"* has occurred. Depending on who shared the content, and who acknowledges it, the relationship can be formed or strengthened at an instructor-to-learner, learner-to-learner, or learner-to-instructor level. The rules were set as follows:

Cell	Level	Rules
Content Sharing, Learner Relationships (3.5.1)	Instructor-to-Learner	A relationship is formed, or strengthened, when an instructor shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Content Sharing, Learner Relationships (3.5.2)	Learner-to-Learner	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and at least one assigned, class, or discipline community group member acknowledges it.
Content Sharing, Learner Relationships (3.5.3)	Learner-to-Instructor	A relationship is formed, or strengthened, when a learner shares some content in relation to the task, and an instructor acknowledges it.

Table B-16: Cell Rules for Content Sharing, Learner Relationships

The first trend of the *"Content Sharing, Learner Relationships"* cell is that all of the relationships that were formed or strengthened were of a learner-to-learner type, as the instructor did not share any content, nor did any learner share content with the instructor, or the instructor acknowledge any content that was shared. Since there was a high count of learners acknowledging content that was shared, there is little surprise that there was a high rate of relationships formed or strengthened from it, which allowed content to be shared from one learner to another learner, For example:

<table>
<tr><th colspan="3">Content Sharing, Learner Relationships: Learner-to-Learner</th></tr>
<tr><td>Blog Reference:
G45B15</td><td>Learner Name:
sad112425878</td><td>Assessment</td></tr>
<tr><td colspan="2">In this blog i will talking about the stages of decision making and what is involved in these stages. The four stages in a decision making process are:

Intelligence – Identify the problem that is occurring in the organisation.

Design – Identify and explore the solutions to the problem.

Choice – Choosing the correct solution for the problem.

Implementation – Making your final decision to work and continue to monitor how the solution is working.</td><td>A learner shares some content in the form of an image to help illustrate their point. (Content Sharing).</td></tr>
<tr><td colspan="3">In response to sad112425878</td></tr>
<tr><td>Blog Reference:
G45B15</td><td>Learner Name:
sad112712305</td><td>Assessment</td></tr>
<tr><td colspan="2">Great blog with a use of a diagram ! Very clever :) In your opinion, do you think that following all the 5 stages will help to make a good decision in the end, or would you perhaps add anything to it? Thank you !</td><td>An assigned group member acknowledges the content that was shared by responding, forming/strengthening a learner-to-learner relationship (Learner Relationships).</td></tr>
</table>

Table B-17: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level

Appendix B.2 Evaluation of IS6118 Blog Enabled CLE

As identified in Chapter 1, IS6118 is an MBS module titled *"Business Continuity and IT Value"*, which consisted of 55 learners (37 male, 18 female) and one instructor. The task was set by the instructor, and required each group, of which there were fourteen, to write a blog post each week on their assigned topic, for six weeks. They were also required to comment on other learner's posts. A total of 323 blog posts were created, and 721 blog comments were made. This activity was analysed with the SMECLE evaluation framework, with the results presented in Figure B-2, where a number of trends were identified at three different levels: *task based*, *characteristic based*, and *cell based*. These are presented next.

			Each group is assigned a topic, and for six weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Blog	**Social Media Characteristics**	Social Interaction	**57** **64%**	**5** **6%**	**25** **28%**	**2** **2%**		**3** **100%**						**1** **33%**		**2** **67%**			**28** **100%**	
		Social Collaboration	**99** **44%**	**13** **6%**	**113** **50%**	**1** **>1%**	**1** **3%**	**38** **97%**											**120** **100%**	
		Content Sharing	**422** **61%**	**62** **9%**	**206** **30%**	**1** **>1%**		**14** **100%**											**189** **100%**	
		User Generated Content	**110** **47%**	**21** **9%**	**100** **43%**	**1** **>1%**		**3** **100%**						**1** **25%**	**1** **25%**	**2** **50%**			**87** **100%**	
		Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure B-2: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS6118 SMECLE

Appendix B.2.1 Task Based Trends

The task that was set for IS6118 was an open one, as it gave learners the opportunity to discuss their assigned topic from any perspective that they wished to, and allowed them to comment on any other learners blogs. A lot of the assigned groups took the same approach to solving the task, where they began writing blog posts on their topic, and then commenting on other learner's blog posts. A trend that could be seen across numerous groups was of learners building on each other's blog posts, where a learner would discuss their topic, and this would influence other assigned group members, and class group members. An example of this was when a learner discussed a topic from a perspective that the other learners had not thought about, but this influenced another assigned group member to take this perspective also when they were writing a blog about the topic, which is a very collaborative approach as learners are building on each other's posts. For example:

Blog Reference: G4B10	**Learner Name:** 04ac	**Assessment**
As I previously discussed in my last blog *https://sopinion8ed.wordpress.com/2012/10/25/the-what-and-the-why-of-strategic-alignment/* *of the importance of Strategic Alignment, I am now going to discuss how Strategic Alignment can help a business gain a competitive advantage. In an article by Weiss and Anderson (2004) they research how aligning a company's strategy affected 15 different companies.*		A learner writes a blog post in relation to strategic alignment, and its potential for providing competitive advantage.
In response to 04ac		
Blog Reference: G4B12	**Learner Name:** pm1083	**Assessment**
While reading the author '04ac's last post on how strategic alignment can help a business gain a competitive advantage .https://sopinion8ed.wordpress.com/2012/11/03/how-strategic-alignment-can-help-a-business-gain-competitive-advantage/ *I began to think more on how IT must be aligned with business strategy to enable a business to be successful. I think this is especially important in today's world due to the constant advances and changes that IT goes through. It is important that executives have the knowledge and ability to align their IT processes with whatever strategies and goals they have set for their business or organisation.*		An assigned group member, who had read the previous blog posts, has been influenced by the perspective that was taken, and it helped them to take a perspective on the blog post that they wrote.

Table B-18: A learner acknowledges a perspective another learner took to complete the task, and uses it for their own topic

This was not always the case, as there were also groups where this did not occur. Instead, learners blogged about their topic, with little reference or acknowledgement to other assigned, or class group members blog posts. However, there were no instances of crossover between blog posts - instead all the blog posts were unique in terms of what they discussed. What did occur were learners offering different views, which sometimes clashed with what other learners had blogged about, or in other instances, learners took a perspective on a topic that complimented other learners blog posts on a different topic. For example:

[redacted]		
Blog Reference: G14B5	**Learner Name:** jamesdaly1990	**Assessment**
Do Information Systems give an organisation a competitive advantage over its competitors? This question has been debated in Erik Brynjolfsson's piece The Productivity Paradox (amongst the huge body of literature that followed) which gave empirical evidence that suggested that I.S did not give a good Return on Investment (ROI). From my own opinion, productivity could not measure intangibles such as the value the organisation creates for its customers and hence giving them an edge over its competitors.		A learner creates a blog post, where they ask a question and begin to answer it, providing some content from an article in their argument.
In response to jamesdaly1990		
Blog Reference: G14B5	**Learner Name:** agblogail	**Assessment**
In your paragraph referring to The Productivity Paradox, you ask the question, "Do Information Systems give an organisation a competitive advantage over its competitors?", and claim that this has been discussed by the Author. However I feel Brynjolfsson's main concern was not competitive advantage, that he was more concerned with the impact of IT on productivity. Also a good ROI, as you believe is hard to measure, does not mean that you will have competitive advantage. Even if there are several intangible benefits this does not guarantee competitive advantage.		A class group member responds to this point that was made, where they do not agree with the perspective that the learner had taken from the article they reference. The learner also provides a response to this comment.

Table B-19: A learner questions a perspective that another learner has taken for their topic, and explains why

Many of the learners wrote their blog posts based on articles that they found, where they would share content from them, or sometimes offer direct quotes. Then, they sometimes offered their opinion on how this impacted their topic, and it was also observed that learners began to ask questions in their blog posts to try and stimulate discussions amongst other learners started, which often worked. It was in the comments section where the discussion(s) occurred, where much of the content was user generated, with learners often giving their opinions, and agreeing/disagreeing with each other. For example, many of the blog posts were in a flow like this:

Blog Reference: G4B23	**Learner Name:** d112221671	**Assessment**
Some scholars while acknowledging the benefits of strategy also warn of its drawbacks. One of these is that technology may turn from a competitive advantage to a necessity. Carr (2003) infact suggested that IT had become ubiquitous and as a result not strategic. This is due to its wide availability. Porter (1985) also suggested that IT had the potential to have a negative impact on organizations.		A learner writes a blog post putting forward arguments against strategic alignment, where they use many articles to make their point.
In response to d112221671		
Blog Reference: G4B23	**Learner Name:** cob12	**Assessment**
Great points, again, d112221671. *I do agree with the points you've made, but I think i stand more on the pro-alignment side. I think there may be ways of achieving alignment that don't necessarily have to be so negatively affected by changing priorities. Just because the enivornment changes, doesn't mean that aligning priorities isn't important. Constantc ommunication can help to keep things focused.*		A class group member responds to the post, where they agree with the points that were made, but they still believe pro-alignment is the way to go.
In response to cob12		
Blog Reference: G4B23	**Learner Name:** d112221671	**Assessment**
Hi cob12 thanks for the feedback! I think i would also be more of the pro strategic alignment side! In my post after this I outline the benefits (https://sopinion8ed.wordpress.com/2012/11/25/strategic-alignment-benefits/) and I think that these would be more beneficial in the long run. I would also agree that constant communication would also help, really shows you hit on something with your previous post "strategic Alignment: Communication". This really does seem to be a vital component of successful strategic alignment!		The original learner responds to this comment, where they acknowledge that they are also pro-alignment, sharing a link to another blog post that they wrote outlining its benefits.

Table B-20: Outline of a typical blog post

Following the trends that have been identified across IS6118, the *characteristic based trends* are presented next.

Appendix B.2.2 Characteristic Based Trends

Active Learning

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Active Learning*, with instances occurring at all four levels (see Figure B-2). For example *Active Learnin*g was enabled by *Social Interaction* when learners left comments on other learner's blogs indicating the blog was good, or informative; that they had learned something from it; or that it had given them an idea for their next blog, and instances occurred across all four levels: individual; assigned group; class group; and discipline community group. *Active Learning* was also enabled by *Social Collaboration*, where the majority was from learners asking questions of other learners, but there was also agreement, and disagreement among learners, and instances occurred across all four levels: individual; assigned group; class group; and discipline community group. For example:

Social Collaboration, Active Learning: Class Group Level		
Blog Reference: G6B5	**Learner Name:** thestrategicblogger	**Assessment**
Interesting post but shouldn t the primary concern for sme's be the consruction of systems and processes to capture and leverage this data rather than devices that can access it? After all implementing something like a enterprise resource planning system can be very costly especially to a firm of limited resources like a small or medium enterprise. It is no suprise a firm like SAP produced a survey such as this, after all they are the one s peddling these costly systems!		A class group member asks another class group member a question *(Social Collaboration)* in relation to the task, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to thestrategicblogger		
Blog Reference: G6B5	**Learner Name:** timh88	**Assessment**
Hi thestrategicblogger. Apologies if my post was misleading but I was just trying to make the point that big data is not solely the concern of large multinationals and that there are benefits to SME's by capturing this data.		The other class group member acknowledges this question, and responds by explaining what they were trying to do, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the question was a class group member, this instance occurred at the class group level.

Table B-21: An Instance of Social Collaboration Enabling Active Learning at the Class Group Level

Active Learning was also enabled by *Content Sharing* when learners shared content, which mainly occurred when they wrote a blog post, but was also observed in the comments, with instances occurring at all four levels: individual; assigned group; class group; and discipline community group instances. Further, *Active Learning* was also enabled by *User Generated Content* when learners gave their opinion to a discussion in relation to the task, with instances occurring at all four levels: individual; assigned group; class group; and discipline community group instances. For example:

<table>
<tr><th colspan="3">User Generated Content, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G9B4</td><td>Learner Name:
cmcoughlan</td><td>Assessment</td></tr>
<tr><td colspan="2">I believe BPM and BPR are management tools which help to bring about improvements in the business and I believe these techniques will be used by business for many years to come.</td><td>A learner creates some original content and shares it (User Generated Content) by providing their opinion in their blog post, where they come to the conclusion that BPM and BPR will be around for many years to come, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to cmcoughlan</td></tr>
<tr><td>Blog Reference:
G9B4</td><td>Learner Name:
04ac</td><td>Assessment</td></tr>
<tr><td colspan="2">I agree with your views on BPM and BPR. By using a business approach such as BPM and a strategy like BPR, it can help a business in achieving such goals as lower costs etc. to improve the overall running of a company. Research has shown that that these two concepts have proven positive results in the past so therefore I would on the same opinion as you in believing that these two concepts are not something of the past.</td><td>A class group member acknowledges this original content by commenting on it, showing they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-22: An Instance of User Generated Content Enabling Active Learning at the Class Group Level

The second trend that was observed across the *Active Learning* cells is that it was not dominated by individual instances, but instead class group instances were close, or had more instances, in some of the cells. For example, class group instances were higher than individual instances when *Social Collaboration* enabled *Active Learning*, indicating that when a learner asked a question, or agreed/disagreed with another learner, they often got an acknowledgment. It was similar when *User Generated Content* enabled *Active Learning*, where assigned group, class group, and discipline community group instances were greater than individual instances, indicating when learners created and shared original content, which the majority of the time it got acknowledged by a learner.

The third trend that was observed was class group instances were much higher than assigned group, or discipline community group instances, indicating that learners were engaging more with class group members, as opposed to their own assigned group members. The trends across *Group Participation* are presented next.

Group Participation

The first trend across the *Group Participation* cells is that four of five social media characteristics enabled *Group Participation*, but not at all levels (see Figure B-2). For example, there were three instances where *Group Participation* was enabled by *Social Interaction* when learners discussed the topic, got a response, and then offered a further response, which all occurred at the class group level. *Group Participation* was also enabled by *Social Collaboration*, with the highest amount of instances, with 39 being observed, where learners agreed, or disagreed with each other, and on the times of disagreement, they would come to a consensus at the end. However, the majority of the time it was learners asking questions that encouraged a discussion to occur, often getting more than two learners involved, and spanning many comments. For example:

<table>
<tr><th colspan="3">Social Collaboration, Group Participation: Class Group Level</th></tr>
<tr><td>Blog Reference:
G9B8</td><td>Learner Name:
ismisetusa</td><td>Assessment</td></tr>
<tr><td colspan="2">Do you perhaps think it is possible to implement a successful BPM or a re-engineering system with the previously existing staff?
my concern would be that the primary aim of engineering the company would be strip it apart and start from scratch. would a team leader who has been part of the company for many years be too dedicated to the cause (ie not see the opportunities that a ‘fresh set of eyes’ would see)</td><td>A learner asks a question of a class group member (Social Collaboration), and explains why they may be concerned about the topic they are discussing.</td></tr>
<tr><td colspan="3">In response to ismisetusa</td></tr>
<tr><td>Blog Reference:
G9B8</td><td>Learner Name:
roisg</td><td>Assessment</td></tr>
<tr><td colspan="2">Thanks for your comments ismisetusa

I do think it is possible to implement a BPM system with the exisiting staff, as that is one of the fundamental differences between BPM & Re-Engineering, BPM can be implemented incrementally without creating the massive disruption that re-engineering could potentially cause.

To address your concern re: needing a fresh set of eyes , while I would agree that perhaps a third party could be used to evaluate the capabilities and assess the current processes within an organisation, I wouldn’t be confident that replacing current staff would be the most effective approach to achieving successful system re-engineering , as I think a knowledge & insight into the processes that are to be re-engineered would be invaluable.</td><td>The class group member acknowledges the question, providing an answer, and also addresses the concern that the other learner had (Group Participation).</td></tr>
<tr><td colspan="3">In response to roisg</td></tr>
<tr><td>Blog Reference:
G9B8</td><td>Learner Name:
ismisetusa</td><td>Assessment</td></tr>
</table>

What would you perhaps do in the case of total process re-engineering? *I would not recommend replacing all staff as this would have more repercussions with team members and employees questioning their worth yet I would still believe in introducing at least one new team member to perhaps oversee the team manager and monitor the development and identify if old habits were being introduced!*		The acknowledgement gets a response from the learner who asked the original question, where they ask a further question *(Social Collaboration)*, and give their opinion on it *(Group Participation)*.
In response to ismisetusa		
Blog Reference: G9B8	**Learner Name:** roisg	**Assessment**
Certainly that would be a concern that any project manager would need to be cognisant of – I do think with process re-engineering it would be necessary to re-assess the core capabilities of the team & identify the need for 'new blood' if so required.		This gets a further response from the learner who the question was asked of, and a consensual answer is reached *(Group Participation)*. As this participation was between class group members, this instance occurred at the class group level.

Table B-23: An Instance of Social Collaboration Enabling Group Participation at the Class Group Level

There were also three instances where *Group Participation* was enabled by *User Generated Content* when learners created and shared some original content in the form of text, and got an acknowledgement, which got further acknowledged, which all occurred at the class group level. Further, *Group Participation* was enabled by *Content Sharing* when learners shared content in the form of images, text, or video, which were acknowledged by another learner, which got further acknowledged, which all occurred at the class group level also. For example:

Content Sharing, Group Participation: Class Group Level		
Blog Reference: G3B2	**Learner Name:** le1008	**Assessment**
On the question of why social business works within a company IBM say that "When you inspire your workforce to innovate and collaborate more productively, you create tangible business value. When you anticipate needs and deliver exceptional experiences, you delight your customers and create advocates. When you integrate your business processes with the right social tools, you secure a competitive advantage and pioneer new ways of doing business" (www.ibm.com).		A learner shares content in the form of text *(Content Sharing)* in relation to the task from IBM.
In response to le1008		
Blog Reference: G3B2	**Learner Name:** eddyjquinn	**Assessment**
Just off a bit of opinion, in relation to your statement from ibm"...you secure a competitive advantage and pioneer new ways of doing business", surly if every company adopts social business practices and ideologies than all companies will have the same "social business advantage". Therefore in my opinion, competitive advantage only cannot be directly associated with social business.		A class group member acknowledges this shared content by giving their opinion on it *(Group Participation).*
In response to eddyjquinn		
Blog Reference: G3B2	**Learner Name:** le1008	**Assessment**
I do agree with you on this and it is a good point. It makes sense that if all businesses adapt to social business then there will be no companies with that 'edge' over others.		This is further acknowledged by the learner who wrote the blog post, who agrees with them, and explains why, and a consensus is reached *(Group Participation).* As this participation was between class group members, this instance occurred at the class group level.

Table B-24: An Instance of Content Sharing Enabling Group Participation at the Class Group Level

The second trend that was observed was that the majority of instances occurred at the class group level for all of the characteristics, except for a single instance that occurred as the assigned group level. This indicates that any time a discussion occurred, which involved at least three interactions, it was between learners of different assigned groups, as opposed to assigned group members having discussions amongst themselves (see Figure B-2). The trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

The trend across *Role of the Instructor* is that there wasn't a single instance of a social media characteristic enabling the *Role of the Instructor* (see Figure B-2). This is because the instructor was non-existent in the IS6118 SMECLE. That is to say, there wasn't a single instant where the instructor created a blog post for the class, or commented on learner's blog posts. Instead they removed themselves from the exercise, trusting the learners to contribute, and interact. In a collaborative learning environment this would not be recommended, as it is necessary for an instructor to monitor what learners are contributing, and if necessary, offer guidance and mediate. This is not to say the instructor was not available for guidance in person, or through other platforms such as email, but it meant there was no possibility of a social media characteristic enabling the *Role of the Instructor*. The trends observed across *Learner Diversity* are presented next.

Learner Diversity

The first trend across *Learner Diversity* is that two of the social media characteristics (*Social Interaction*, and *User Generated Content*) enabled *Learner Diversity*, with instances at three of the four levels: individual; assigned group; and class group, with no discipline community group instances (see Figure B-2). For example, there were three instances where *Learner Diversity* was enabled by *Social Interaction* when learners were discussing the task, where in the first instance they mentioned a presentation they had attended, with the other instance having learners quickly relate to an experience they had within an organisation that they had worked at, with instances observed at both the individual, and class group levels, with no assigned group, or discipline community group instances. For example:

Social Interaction, Learner Diversity: Individual Level		
Blog Reference: G3B16	**Learner Name:** irishtechylad	**Assessment**
I found this article quite interesting because I could relate to whats been said in it relation to a company intranet being dull and boring which is sometihng i experienced in a previous job. If this is the case in a company, they should use a social solution allowing them to take the social features and infuse them into the daily work experience. If a company uses email such as Microsoft Outlook and collaboration tools they should also make them social. So I concur with the final statement – 'Viva la Evolution'		A learner makes a comment on their own blog post where they discuss a topic in relation to the task, and refer to their background when doing so *(Learner Diversity)*. As no other learner acknowledged the comment, the instance occurred at the individual level.

Table B-25: An Instance of Social Interaction Enabling Learner Diversity at the Individual Level

Learner Diversity was also enabled by *User Generated* Content on five occasions when learners provided real world examples of when they used a particular system that was discussed, or discussing a topic with a work colleague who was familiar with the area they were discussing, with instances observed at the individual, assigned group, and class group levels, with no discipline community group instances. For example:

User Generated Content, Learner Diversity: Individual Level		
Blog Reference: G13B11	**Learner Name:** 1rguru	**Assessment**
I have also encountered this while working in finance. A new IS system called 'Powersim' was being introduced to the company to help forecast figures many years into the future. The call to introduce this system was made by the head of Finance who saw the system benefiting the company in the long term. *However the people using the new system, who would normally have used Microsoft Excel to generate the figures found the new system as a hindrance. As the system was only in the Implementation stage there where many problems with it, however after a few months the system would be 'bug free' and would save the company a lot of time in a process that would have normally taken about a month could now be done in a week.* *However the issue here is that the people in finance would revert back to using Excel because they had no faith in this new system. Instead of the finance department being in control of these forecasts the IT department where now also heavily involved.* *I believe the main issue here is the resistance to change. (Coch and French 1948) said that resistance to change is normal. ''A large percentage of IS projects fail because the process of organisational change surrounding system building was not properly addressed. Successful system building requires careful Change Management.'' (Laudon 2006)*		A learner makes a comment on a blog post, where they provide an example of a new system being implemented into an organisation they were working at, and how it impacted their work *(Learner Diversity)*. As no other learner acknowledged the content, the instance occurred at the individual level.

Table B-26: An Instance of User Generated Content Enabling Learner Diversity at the Individual Level

Following the trends that have been identified across *Learner Diversity*, the trends observed across *Learner Relationships* are presented next.

Learner Relationships

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, but not at all the levels as the instructor was not engaged on the platform at all, nor did the learners try to engage with them in the environment (see Figure B-2). For example, *Learner Relationships* were enabled by *Social Interaction* when learners discussed topics in relation to the task, all at the learner-to-learner level. *Learner Relationships* were enabled by *Social Collaboration* when learners asked questions and got responses by other learners, or agreed, and disagreed with each other, getting a response, all at the learner-to-learner level. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content that got acknowledged by other learners, all at the learner-to-learner level. Finally, *Content Sharing* also enabled *Learner Relationships* when learners shared content that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner. For example:

<table>
<tr><th colspan="3">Content Sharing, Learner Relationships: Learner-to-Learner</th></tr>
<tr><td>Blog Reference:
G3B1</td><td>Learner Name:
zonic89</td><td>Assessment</td></tr>
<tr><td colspan="2">Within IBM they believe that Social Business is one that becomes engaged, transparent and nimble. Social Business engages with its customers, employees, stakeholders and suppliers in different ways. It is transparent in the way that it opens up and provides access to subject matter experts. It is nimble in the way it reacts quickly when the right people collaborate together and get the job done. This video is interesting as leading UK bloggers David Terrar, David Cushman, Chris Turner and Johnnie Moore collaborate with IBM specialists Jon Mell, Jon Machtynger and Alex Bray to provide their different perspectives on the model of Social Business.http://www.youtube.com/watch?v=MlULxvaPsF4&feature=related</td><td>A learner shares some content in the form a link to a YouTube clip, and explains what it is (Content Sharing).</td></tr>
<tr><td colspan="3">In response to zonic89</td></tr>
<tr><td>Blog Reference:
G3B1</td><td>Learner Name:
eddyjquinn</td><td>Assessment</td></tr>
<tr><td colspan="2">Good blog, I found the YouTube link very informative and interesting, this has actually raised more questions for me regarding social business, in particular the concept that social business is not such a new phenomenal….watch out for my blog, I may raise a few points of interest to you.</td><td>A class group member acknowledges the content that was shared by responding, forming/strengthening a learner-to-learner relationship (Learner Relationships).</td></tr>
</table>

Table B-27: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that all the relationships that were formed or strengthened were of a learner-to-learner type, which is not what is expected as there should be some input from the instructor. The *cell based trends* are presented next.

Appendix B.2.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Collaboration, Active Learning"*
- *"Content Sharing, Active Learning"*
- *"User Generated Content, Learner Relationships"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS6118 SMECLE.

Social Collaboration, Active Learning

Social Collaboration occurs when learners interact to generate, edit, and share content out of a necessity. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if learners ask questions of other learners, or agree/disagree with other learners, in relation to the task, and explain why, an instance of *"Social Collaboration, Active Learning"* has occurred. Depending on who asks the questions, or agrees/disagrees, the occurrence may be at an assigned group level, class group level, or discipline community group level. The rules were set as follows:

Cell	Level	Rules
Social Collaboration, Active Learning (2.1.1)	Individual	A learner asks a group member(s) a question(s) in relation to the task, but no group member acknowledges it. or A learner agrees/disagrees with a group member(s) in relation to the task, and explains why, but no group member acknowledges it.
Social Collaboration, Active Learning (2.1.2)	Assigned Group	An assigned group member asks another assigned group member(s) a question(s) in relation to the task. or An assigned group member agrees/disagrees with another assigned group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.3)	Class Group	A class group member asks another class group member(s) a question(s) in relation to the task. or A class group member agrees/disagrees with another class group member(s) in relation to the task, and explains why.
Social Collaboration, Active Learning (2.1.4)	Discipline Community Group	A discipline community member asks a class group member(s) a question(s) in relation to the task. or A discipline community member agrees/disagrees with a class group member(s) in relation to the task, and explains why.

Table B-28: Cell Rules for Social Collaboration, Active Learning

The first trend of the *"Social Collaboration, Active Learning"* cell is that while there were many instances of learners asking questions, and agreeing with each other as evidenced in , the majority of these occurred at the class group level (50%). This indicates that when learners who asked questions, or agreed with other learners, they often got acknowledged by getting an answer, or a response to an agreement. However, individual instances were also quite high (44%), meaning there were also a high number of instances of learners not getting any acknowledgment.

The second trend of the *"Social Collaboration, Active Learning"* cell is that when learners were acknowledging questions, or agreements, they were mostly class group instances as opposed to assigned group instances (see Figure B-2). That is to say, when learners asked questions, or agreed/disagreed with each other, it was more likely that a class group member would respond, as opposed to assigned group, or class group members. For example:

<table>
<tr><th colspan="3">Social Collaboration, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G4B18</td><td>Learner Name:
cdat2</td><td>Assessment</td></tr>
<tr><td colspan="2">Good post thestrategicblogger! You stated that “73% of firms say they outsource part of their I.T. application service, while 62% of respondents say they outsource infrastructure services, while it is only second to investment in cloud computing in terms of I.T. functions firms invest in.” I found these statistics very interesting and strongly reinforced the point you were making. I am curious to know how new this data is and what type of firms were questioned?</td><td>A learner asks a class group member a question (Social Collaboration) in relation to some statistics that they provided, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to cdat2</td></tr>
<tr><td>Blog Reference:
G4B18</td><td>Learner Name:
thestrategicblogger</td><td>Assessment</td></tr>
<tr><td colspan="2">I m glad you enjoyed the post the figures were extracted from Bluewolf a global Agile Consulting Agency and their report entitled “The State of IT Outsourcing” comes from August 2012. The information was gathered from their list of clients which include GSK, Zynga, Black & Decker, Compuware, NBC Universal and Avon Products. A diverse and reputable list I m sure you ll agree.</td><td>The class group member acknowledges the question that was asked by answering it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the question was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-29: An Instance of Social Collaboration Enabling Active Learning at the Class Group Level

The third trend of the *“Social Collaboration, Active Learning”* cell is that the majority of instances were enabled by learners asking questions of other learners, but there were also a high amount of instances where they agreed with each other, explaining why, while there were also some instances of learners disagreeing with each other. Further to this, on numerous occasions, when learners asked questions, it resulted in discussions occurring, where not only did the learner who wrote the blog post respond, but also other learners would respond. Interestingly, often when learners were asking questions, they asked for the learner's opinion on the topic they had just blogged about, suggesting that learners may not have been opinionated enough in their blog post. A trend that also occurred was that of learners who wrote blog posts putting questions at the end of their post to try stimulate discussions, which often resulted in other learners providing answers to these questions. The trends observed across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are Actively Learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to indicate they have consumed and understood it. The rules were set as in Table B-14 in section Appendix B.1.3.

With the most recorded instances of the entire class, the first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in Figure B-2, it was very beneficial to individuals (60%), although it was often beneficial to other learners also, as assigned group, class group, and discipline community group account for 40% of instances combined.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, they were mainly class group instances, as opposed to assigned group, or discipline community group instances (see Figure B-2), where learners were going to other learner’s blog posts, and acknowledging the content that was shared on them. For example:

<table>
<tr><th colspan="3">Content Sharing, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G5B17</td><td>Learner Name:
anon100</td><td>Assessment</td></tr>
<tr><td colspan="2">To help us understand more about the role of the CIO, it would probably be useful to examine the features of an average CIO. A 2005 survey of 405 CIOs by trade magazine ‘CIO Insight’ threw up some interesting results. It found the position to be male dominated (91%) with 26% of CIOs having spent half their career in IT and half outside of IT. On top of that 55% of CIOs said contributing to corporate strategy is one of their three top responsibilities – with the same figure reporting to the chairman, CEO or president of their company. The predominant concerns for CIOs are improving business processes, IT infrastructure and architecture, and security. In a 2012 context however one would presume less resources would be available to CIOs making these tasks all the more difficult.</td><td>A learner shares some content, in the form of text (Content Sharing), from an article they read, which consists of figures about CIOs, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to anon100</td></tr>
<tr><td>Blog Reference:
G5B17</td><td>Learner Name:
corcoranchris</td><td>Assessment</td></tr>
<tr><td colspan="2">Not my topic, but I was reading through the 2005 survey figures you provided and one in particular grabbed my attention: 91% of CIOs being male? I had an inkling that males dominated the role alright but that figure caught me by surprise I have to admit, as I’m sure it did others. Secondly, 65% of CIOs still coming from an IT exclusive background is a striking figure too. I would have thought that chief executives were looking for business minded individuals / more all rounded individuals for said position. An eye-opening blog all-round, ‘anon100'.</td><td>A class group member acknowledges this shared content by leaving a comment, showing their understanding of it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-30: An Instance of Content Sharing Enabling Active Learning at the Class Group Level

The third trend of the *"Content Sharing, Active Learning"* cell is that the dominant type of content that was shared consisted of text, where learners often based their blog post on one, or multiple articles and either provided quotes, or ideas from the article(s). Blog posts also contained other types of content, including images, videos, and links. Learners also often shared content when commenting on other blog posts and a trend that started to occur was that of sharing links to their own blog posts. The trends across *"User Generated Content, Active Learning"* are presented next.

User Generated Content, Active Learning

User Generated Content is original content created by the learner, or building on previously existing content. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner creates original content in relation to the task, they are Actively Learning by participating in a constructive and iterative process, and an instance of *"User Generated Content, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have actively learned from it. The rules were set as follows:

Cell	Level	Rules
User Generated Content, Active Learning (4.1.1)	Individual	A learner creates, and shares some original content in relation to the task, but no group member acknowledges it.
User Generated Content, Active Learning (4.1.2)	Assigned Group	A learner creates, and shares some original content in relation to the task, and at least one assigned group member acknowledges it, showing their understanding of it.
User Generated Content, Active Learning (4.1.3)	Class Group	A learner creates, and shares some original content in relation to the task, and at least one class group member acknowledges, it showing their understanding of it.
User Generated Content, Active Learning (4.1.4)	Discipline Community Group	A learner creates, and shares some original content in relation to the task, and at least one discipline community group member acknowledges it, showing their understanding of it.

Table B-31: Cell Rules for User Generated Content, Active Learning

The first trend of the *"User Generated Content, Active Learning"* cell is that when learners created and shared some original content, it was beneficial on all four levels: individual (47%); assigned group (9%); class group (43%); and discipline community group (6%). This indicates that the original content that was being shared was often beneficial to not just the individual who created it, but to other learners also.

The second trend of the *"User Generated Content, Active Learning"* cell is that when learners did generate and share some original content, and it was acknowledged, the majority of the time they were class group instances (see Figure B-2). This often consisted of a learner creating a blog post, another learner asking a question in relation to it, and then the learner who wrote the blog post giving their opinion. For example:

<table>
<tr><th colspan="3">User Generated Content, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G10B3</td><td>Learner Name:
eddyjquinn</td><td>Assessment</td></tr>
<tr><td colspan="2">In my opinion, one aspect which may have been overlooked, is in relation to the historical development of how we have come to the current social business we know today. For example, taking the human race and its evolution, there has been much evidence of the social behavior since man existed in every culture, equally social behavior can be applied in a commerce context e.g bartering etc.</td><td>A learner creates and shares some content (User Generated Content) by giving their opinion while writing their blog post, explaining why, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to eddyjquinn</td></tr>
<tr><td>Blog Reference:
G10B3</td><td>Learner Name:
blackbird333</td><td>Assessment</td></tr>
<tr><td colspan="2">I enjoyed reading your blog. Instead of defining what the term social business is, you showed what it is by providing the example of the Cadbury Wispa Campaign. I found this video interesting as it portrayed how effective and powerful social media is for the company. It showed that social business is the way forward as it improves the relationship with customers. For example, weeks after the website launch Cadburys sold 36,438,417 bars equalling £18,408,762 value sales. That is a great achievement.</td><td>A class group member acknowledges this original content, and explains there understanding of it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-32: An Instance of User Generated Content Enabling Active Learning at the Class Group Level

The third trend of the *"User Generated Content, Active Learning"* cell is that all of the content that was generated by learners was in the form of text, when they gave their opinion. There was no instance of learners generating any other type of content such as a video, or an image.

Appendix B.3 Evaluation of IS1100 Blog Enabled CLE

As identified in Chapter 1, IS1100 is a 1st year undergraduate module titled *"Introduction to Business Information Systems"*, which consisted of 91 learners (55 male, 36 female) and one instructor. The task was set by the instructor, and required each group, of which there were twenty-three, to write a blog post each week on their assigned topic, for six weeks. They were also required to comment on other learner's posts. A total of 307 blog posts were created and 1032 comments were made. This activity was analysed with the SMECLE evaluation framework, with the results presented in Figure B-3, where a number of trends were identified at three different levels: *task based*, *characteristic based*, and c*ell based*. These are presented next.

			Each group is assigned a topic, and for seven weeks, each group member is required to write at least one blog post each week on that topic. Learners are also required to comment on other posts.																	
			Collaborative Learning Characteristics																	
			Active Learning				Group Participation			Role of the Instructor				Learner Diversity				Learner Relationships		
			I	AG	CG	DCG	AG	CG	DCG	I	AG	CG	DCG	I	AG	CG	DCG	I-to-L	L-to-L	L-to-I
Blog	Social Media Characteristics	Social Interaction	125 75%	5 3%	37 22%			1 100%						1 100%					45 100%	
		Social Collaboration	53 54%		46 46%			13 100%											48 100%	
		Content Sharing	141 38%	37 10%	192 52%			1 100%											251 100%	
		User Generated Content	75 57%	6 5%	51 39%			6 100%				4 100%		2 50%		2 50%			50 100%	
		Social Connectedness																		

I = Individual
AS = Assigned Group
CG = Class Group
DCG = Discipline Community Group

I-to-L = Instructor-to-Learner
L-to-L = Learner-to-Learner
L-to-I = Learner-to-Instructor

Scale: 1%-20% | 21%-40% | 41%-60% | 61%-80% | 81%-100%

Figure B-3: Overview of Social Media Characteristics Enabling Collaborative Learning Characteristics in the IS1100 SMECLE

Appendix B.3.1 Task Based Trends

The task that was set for IS1100 was an open one, as it gave learners the opportunity to discuss their assigned topic from any perspective that they wished to, and allowed them to comment on any other learners blogs. The majority of the assigned groups took the same approach to solving the task, where they began writing blog posts on their topic, and then commenting on other learner's blog posts. There was little evidence of learners discussing how they were going to solve the task, except for one or two instances where learners asked questions about it in the comments section. This is perhaps a limitation of the blogging platform, as it does not provide any features to enable this type of discussion. Instead, it was observed that learners were writing blog posts on their own, without consulting their assigned group members. That is to say, learners were rarely acting in a collaborative manner in terms of building on each other's blog posts, but were instead, as individuals, deciding on what to blog about. This appears not to have impacted on the range of perspectives taken on blog posts, as assigned group's blog posts that were rarely the same.

There were also instances where learners were stimulated by what other assigned group members, or class group members, had blogged about, which resulted in them creating a blog post that was building on what others had done. This is a much more collaborative approach, where learners are not randomly creating blog posts on a topic, but instead trying to build on each other's contributions. For example:

Blog Reference: G10B25	**Learner Name:** oozz112323436	**Assessment**
Resistance can be a positive if for example the users rejection of the new IS due to it being technologically deficient is true. By resisting this inefficient IS the users have done the firm a huge favour. The firm may be saved a lot of money as it will not have to spend a lot of money implementating an IS that is inefficient and will not be of any benefit to the firm and may even have reduced the performance of the firm as a whole. Resistance may also be a positive because if the system was flawed it would have caused an immense amount of stress for system users who would have been doing their work poorly due to no fault of their own.		A learner discusses their topic of *"IS Implementation"* from the perspective of positive aspects of resistance to change.
In response to oozz112323436		
Blog Reference: G10B25	**Learner Name:** oozz110368417	**Assessment**
This is an interesting perspective on the positive aspects of resistance to change. I instinctively presumed resistance to be counter productive but your post does make some valid points. Also if firms realise from day 1 that humans are creatures of habit and unlikely to respond well to change, then they will realise that if they want to bring out a new IS it will have to be top quality, easy to understand and it's advantages should be obvious and very beneficial for the user if they wish to overcome peoples fear of the unknown.		A class group member acknowledges this post, and indicates that they find the perspective interesting, and was not a way they thought about it before.

Table B-33: Learners take a collaborative approach to completing the task

Following this blog post, the learner who responded to it as being an interesting perspective, wrote their own blog post, which is on the topic of *"IS Implementation"*.

Blog Reference: G2B4	Learner Name: oozz110368417	Assessment
After reading an interesting post on the benefits of resistance to implementation I decided to do some research on the benefits of implementation. Resistance is a completely natural reaction to change and is regarded by some as a "universal phenomenom" People might be resistant to new IS's due to loyalty to old methods or fear of a loss of their jobs or status and because uncertainty usually accompanies change. People may feel they had nothing to do with the decision making process of this new system and thus be reluctant. Participation is thought to produce commitment and loyalty towards the new system. If an information system is to be successful then users must be convinced of the merits of change. In order for people to respond positively to change then they must feel change will bring them benefits. If the present system is perceived as satisfactory then the user may be difficult to convince.		A learner, after reading another blog post and discovering a different perspective, does some research and discusses the topic further.

Table B-34: A learner takes a perspective another learner took for their own topic

It was also observed that the majority of comments that learners left on other learner's blog posts were in relation to making suggestions on how they could improve their blog post. For example, learners were suggesting that more examples were required, or explaining that there was too much information in the post, or sometimes linking to other content that could help the blog post. Further to this, one learner started to leave comments for learners when they were plagiarising others work from outside the class, where they were suggesting that the learner should reference properly because it was proving difficult to distinguish their work from the place where they were getting inspiration from. For example:

Social Interaction, Active Learning: Class Group Level		
Blog Reference: G15B10	**Learner Name:** oozz111739669	**Assessment**
Hi, rather than just copy and paste the contents of this article into bisbabblers, I would have preferred it if you could have talked ABOUT it (interesting points and/or main points relevant)…		A learner leaves a comment on a class group member's blog post where they suggest that instead of copying and pasting an article, it would be more interesting discussing the points made in the article.
In response to oozz111739669		
Blog Reference: G15B10	**Learner Name:** oozz112389031	**Assessment**
Will take it into account, thank you sir/madam.		The learner responds with a simple thank you.

Table B-35: A learner indicates that a class group member is plagiarising others work

There was also the a trend of learners leaving comments that did not indicate they had read, or understood a blog post, but instead was an attempt to get marks for little effort. For example, learners were leaving comments such as *"great blog"*, *"interesting reading"*, and *"cant believe the amount of information that was in this blog"*, instead of actually leaving some engaging comments about a blog post. The *characteristic based trends* are presented next.

Appendix B.3.2 Characteristic Based Trends

Active Learning

Active Learning was the most enabled collaborative learning characteristic in this learning environment, where the first trend across the *Active Learning* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Active Learning*, with instances occurring at three of the four levels (see Figure B-3). For example *Active Learning* was enabled by *Social Interaction* when learners left comments on other learner's blogs indicating the blog was good, or informative; that they had learned something from it; or that it had given them an idea for their next blog, and instances occurred across three of the four levels: individual; assigned group; and class group;

there was no instance at the discipline community group level. *Active Learning* was also enabled by *Social Collaboration*, only occurred across two levels: individual, and class group, with no instance at the assigned, or discipline community group levels. The majority of instances were from learners agreeing with other learners, and there were also instances of learners asking questions of other learners, and disagreements occurring. For example:

Social Collaboration, Active Learning: Class Group Level		
Blog Reference: G8B9	**Learner Name:** oozz111423278	**Assessment**
This blog was very useful, and had interesting facts and examples throughout to make it more interesting and easier to understand. I agree with the points made about the problems resistance to implementing new IS can create within organisations, however there are steps that can be taken by management in order to overcome the resistance problem. They are by: -Communicating with users early, months before installing new IS if necessary, in order to prepare the user for the change -Get feedback from employees on their opinions, and respond to any concerns -Ensure the users are well aware of the benefits the new IS will give them -Provide users with adequate training for the new IS		A learner makes a comment on a class group member's blog, where they agree with the points that were made *(Social Collaboration)* and make suggestions on how they can overcome the problems encountered, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to oozz111423278		
Blog Reference: G8B9	**Learner Name:** oozz112100714	**Assessment**
Thanks for the comment. I agree with the point that your making, that certain stakeholders will have different factors as their top priority. System owners would definitely have cost very high on their list of priorities, and system users would regard functionality and security high on their list. I think they would also regard usability as an important factor and also integrity.		A class group member, who wrote the blog, acknowledges the comment by responding to it, and again agrees with the points that were made, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the agreement was a class group member, this instance occurred at the class group level.

Table B-36: An Instance of Social Collaboration Enabling Active Learning at the Class Group Level

Active Learning was also enabled by *Content Sharing* when learners shared content, which mainly occurred when they wrote a blog post, but was also observed in the comments, with instances occurring at three of the four levels: individual, assigned group, and class group, with no discipline community group instance. Further, *Active Learning* was also enabled by *User Generated Content* when learners gave their opinion to a discussion in relation to the task, with instances occurring at three of the four levels: individual, assigned group, and class group, with no discipline community group instance. For example:

User Generated Content, Active Learning: Class Group Level		
Blog Reference: G13B2	**Learner Name:** oozz112470298	**Assessment**
Though your knowledge of the agile model is very evident here, I feel your argument should be more balanced as it is too one sided towards the agile model. I feel neither approach can be considered superior over the other due to the varying objectives of projects and stake holders and the complexity of software development in general. Perhaps you should have included some negative aspects of the agile model also, such as the unstructured nature of the agile model.		A learner creates some original content and shares it *(User Generated Content)* by providing their opinion on the argument that was made in the blog post, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*.
In response to oozz112470298		
Blog Reference: G13B2	**Learner Name:** oozz112361231	**Assessment**
Thank for your comment. I can see your point. Maybe I should of focused on the negative aspects of the agile method more. I was trying to get my opinion across that I feel that the agile method is a more superior method, but here is a short power point i found online about the negative aspects of the agile method.		A class group member acknowledges this original content by commenting on it, showing they have consumed, and understood it, thus participating in a constructive and iterative process of interaction and negotiation *(Active Learning)*. As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.

Table B-37: An Instance of User Generated Content Enabling Active Learning at the Class Group Level

The second trend that was observed across the *Active Learning* cells is that it was not dominated by individual instances, but instead class group instances were close, or had more instances, than it in some of the cells. For example, class group instances were higher than individual instances when *Content Sharing* enabled *Active Learning*, indicating that when learners shared content, it was not only beneficial to the individual who did so, but often it benefited other learners too. While the other trend across the other cells was that individual instances were higher than the other levels, however they were close, which indicates that when learners tried to discuss the task, ask questions, or generate and share content, they were often getting responses from other learners.

The third trend that was observed was class group instances were much higher than assigned group, or discipline community group instances, indicating that learners were engaging more with class group members, as opposed to their own assigned group members. The trends across *Group Participation* are presented next.

Group Participation

The first trend across the *Group Participation* cells is that four of the social media characteristics (*Social Interaction*, *Social Collaboration*, *Content Sharing*, and *User Generated Content*) enabled *Group Participation*, but not at all levels (see Figure B-3). For example, there was a single instance of *Group Participation* being enabled by *Social Interaction* when a learner made a suggestion as to how a learner could improve their blog post, with the learner acknowledging it by providing the improvement, which was acknowledged by the original learner. *Group Participation* was also enabled by *Social Collaboration*, with the highest amount of instances, with 13 being observed, with a mixture of learners agreeing, or disagreeing with each other, and on the times of disagreement, coming to a consensus at the end, or learners asking questions that encouraged a discussion to occur, but most of these only lasted for three comments, which sometimes got other learners involved. For example:

Social Collaboration, Group Participation: Class Group Level		
Blog Reference: G2B11	**Learner Name:** oozz112323436	**Assessment**
Your piece helped further my knowledge of the different conversion types but I would have liked to have received your opinion on which method you deem the most/least effective. I personally feel the phased approach is the best because the system is only phased in gradually so if a fault is found at least the whole company would not be affected. What are your opinions on this?		A learner leaves a comment on a class group learner's blog post, where they provide their opinion which is in contrast to what was written in the post, and ask the learner what they think *(Social Collaboration).*
In response to oozz112323436		
Blog Reference: G2B11	**Learner Name:** oozz111326241	**Assessment**
Thanks for your comment *I agree with aspects of your preference towards the phased approach, however i believe i would go for the parallel conversion. I think this is the least risky conversion of all, and even though the cost is higher, it is worth it to avoid panic if something goes wrong. Even with the phased conversion, if something goes wrong that is still an entire department down. With the parallel conversion you always have a back up. If the new system goes down, you have the old one to fall back on and vica versa.* *I also believe that it gives users a gentle introduction to the new system, therefore avoiding stressed confused employees. If information is lost on the new system they can go back to the old system to recover it. Eventually once all creases in the conversion are smoothed out, the business can change solely to the new system in a calm relaxed manor.*		The learner acknowledges the question by responding to it, and they explain why they choose one approach over another *(Group Participation).*
In response to oozz111326241		
Blog Reference: G2B11	**Learner Name:** oozz112323436	**Assessment**
I never taught about the parallel		The learner who asked the initial

approach in that way, thanks for helping me see another point of view.	question responds explaining they had never thought of the approach in that way and a consensus is reached *(Group Participation)*. As this participation was between class group members, this instance occurred at the class group level.

Table B-38: An Instance of Social Collaboration Enabling Group Participation at the Class Group Level

There were also a single instance where *Group Participation* was enabled by *Content Sharing* where a learner shared a link to an article, that learner acknowledged, which was further acknowledged by the learner who wrote the blog post, which occurred at the class group level. Further, *Group Participation* was enabled by *User Generated Content* on six occasions, when learners created and shared some original content in the form of text, and got an acknowledgement, which got further acknowledged, all at the class group level again. For example:

<table>
<tr><th colspan="3">User Generated Content, Group Participation: Class Group Level</th></tr>
<tr><td>Blog Reference:
G5B23</td><td>Learner Name:
oozz112369636</td><td>Assessment</td></tr>
<tr><td colspan="2">Excellent Piece on a System anaylst I liked how you brought it all togeather on all the jobs that the system anaylst does. However I think maybe you should emphasise more that they are in the middle of all operations. They really are the key factor to success, the speak the tech talk for the system designers and then they can also speak business which would be for the managers etc of the company.</td><td>A learner leaves a comment on a class group member’s blog, where they share some original content (User Generate Content) by giving their opinion in terms of how the author should write more about the systems analyst.</td></tr>
<tr><td colspan="3">In response to oozz112369636</td></tr>
<tr><td>Blog Reference:
G5B23</td><td>Learner Name:
oozz111461198</td><td>Assessment</td></tr>
<tr><td colspan="2">Very valid point. Your definitely correct in saying that the system analyst is the main cog in the wheel of the operation. They are the most important link between the system designers and the managers of an organization. I appreciate your feedback.</td><td>The class group member acknowledges this original content by who agreeing with the point made, and explaining why (Group Participation).</td></tr>
<tr><td colspan="3">In response to oozz111461198</td></tr>
<tr><td>Blog Reference:
G5B23</td><td>Learner Name:
oozz112357106</td><td>Assessment</td></tr>
<tr><td colspan="2">I found this blog good in understanding the role of a system analyst within a firm. It seemed to mention all the jobs which they partake in. However I do agree with the first comment that maybe you should have emphasized a bit more that they are the middle person, they speak both the business language and the technology language. Good blog overall.</td><td>This is further acknowledged by another learner, who also agrees with the initial point made, and explains why too, and a consensus is reached (Group Participation). As this participation was between class group members, this instance occurred at the class group level.</td></tr>
</table>

Table B-39: An Instance of User Generated Content Enabling Group Participation at the Class Group Level

The second trend that was observed was that all of the instances occurred at the class group level for all of the characteristics. This indicates that any time a discussion occurred, which involved at least three interactions, it was between learners of different assigned groups, as opposed to assigned group members having discussions amongst themselves (see Figure B-3). The trends observed across the *Role of the Instructor* are presented next.

Role of the Instructor

The first trend across the *Roll of the Instructor* cells is that there are only a few instances, with a total of 4 instances, which initially indicates that the instructor portrayed their role how it is expected. All the instances of *User Generated Content* enabling *Role of the Instructor* involved the instructor providing the task, and the assigned groups, and occurred at the class group level. They then took a step back, and allowed the learners to drive the discussion, and were ready for when learners required any guidance, although they did not ask any question in relation to the task. However, they did not offer any guidance based on reading any blogs or comments. For example there were instances where a learner highlighted on numerous occasions that other learners were copying and pasting content from their sources without referencing it properly, but the instructor failed to rectify these issues. For example:

User Generated Content, Role of the Instructor: Class Group Level		
Blog Reference: I1B2	**Learner Name:** instasugrue	**Assessment**
Defining an Information System (IS) *Concerns such questions as what is an information system (IS)?; what is not an IS?; what is data?; what is information?; what is knowledge?, what are the key components of an IS; and so on?* ***IS and Strategy*** *Concerns organisations use IS as part of their strategy. Of concern maybe an organisations use of IS to achieve competitive advantage.* ***IS Implementation*** *Why do IS implementations fail? Why do they sometimes succeed? Topic also concerns issues such as power, politics, culture, relationships, etc that may impact IS implementation.*		The instructor creates and shares some original content *(User Generated Content)* by providing an overview of the topics that will be assigned to the groups *(Role of the Instructor)*. As the learners who acknowledged the content were class group members, this instance occurred at the class group level.

Table B-40: An Instance of User Generated Content Enabling Role of the Instructor at the Assigned Group Level

Following the trends that have been identified across *Role of the Instructor*, the trends observed across *Learner Diversity* are presented next.

Learner Diversity

The first trend across *Learner Diversity* is that two of the social media characteristics (*Social Interaction*, and *User Generated Content*) enabled *Learner Diversity*, with instances at two of the four levels: individual; and class group, with no assigned group, or discipline community group instances (see Figure B-3). For example, there was one instance where *Learner Diversity* was enabled by *Social Interaction* when a learner referred to their background as a government student when explaining an example, which occurred at the individual level. For example:

Social Interaction, Learner Diversity: Individual Level		
Blog Reference: G15B11	**Learner Name:** oozz112741069	**Assessment**
Well to be honest technology in business can be a good thing and enable a problem to be solved in a fast efficient way. But to but a down side many ISP providers who provide internet could take note from the company you mentioned, mobile phone and internet companies seem to be the worse yet in be good with customers with the product they are providing. *O2 for instance on a problem with a phone where international calls are locked, neither in store are online have they solved the problem and at this stage its a case of giving up because it seems to be a waste of time.* *So somethings work when the right services are provided but sometimes thing do not work because the bad public relations systems some companies have.* *As a government student to say the least some companies its like dealing with politicians you never get what you asking for no matter how hard you try.*		A learner makes a comment *(Social Interaction)* in relation to the task, and draws on their background as a government student in doing so *(Learner Diversity)*. No learner acknowledged this so the instance occurred at the individual level.

Table B-41: An Instance of Social Interaction Enabling Learner Diversity at the Individual Level

Learner Diversity was also enabled by *User Generated* Content on four occasions when learners provided real world examples of when they started their own company, wrote a post about a speaker in their class, and spoke about their experience of a previous example of using social media in a learning environment, with instances observed at the individual, and class group levels, with no assigned group, or discipline community group instances. For example:

User Generated Content, Learner Diversity: Individual Level		
Blog Reference: G14B7	**Learner Name:** oozz112369636	**Assessment**
I agree that small firms use social media like facebook and twitter to get their own business names out there and it can be a great way of advertising. There is no doubt about that. *However in 2009 I started up my own mini company and like many others instead of going though the effort of designing a website I said I would start on Facebook. While it was very good at getting likes and etc What I found overall is that people who actually want to buy from you want a direct link to a website. They don't want to be sending emails or ringing phone numbers asking about products. They want a direct link to a website in which they can order the product with no hassle. They want to save time.*		A learner creates and shares some original content *(User Generated Content)* by responding to a class group learners comment, where they provide an example of when they set up their own company, and explain the experience they had in relation to suing social media *(Learner Diversity)*. No learner acknowledged this so the instance occurred at the individual level.

Table B-42: An Instance of User Generated Content Enabling Learner Diversity at the Individual Level

Following the trends that have been identified across *Learner Diversity*, the trends observed across *Learner Relationships* are presented next.

Learner Relationships

The first trend across the *Learner Relationships* cells is that four of the social media characteristics (*Social Interaction, Social Collaboration, Content Sharing, and User Generated Content*) enabled *Learner Relationships*, but not at all the levels as the instructor was not engaged on the platform all of the time, nor did the learners try to engage with them in the environment (see Figure B-3). For example, *Learner Relationships* were enabled by *Social Interaction* when learners discussed topics in relation to the task, all at the learner-to-learner level. *Learner Relationships* were enabled by *Social Collaboration* when learners asked questions and got responses by other learners, or agreed, and disagreed with each other, getting a response, all at the learner-to-learner level. *Learner Relationships* were also enabled by *User Generated Content* when learners created and shared some original content that got acknowledged by other learners, all at the learner-to-learner level. Finally, *Content Sharing* also enabled *Learner Relationships* when learners shared content that got acknowledged by other learners, with all the instances occurring across one level: learner-to-learner. For example:

Content Sharing, Learner Relationships: Learner-to-Learner		
Blog Reference: G8B7	**Learner Name:** oozz112100714	**Assessment**
The Four Steps a company should follow to build up their customer engagement levels are: A. *Clearly define your objectives.* B. *Foster current participation and encourage more of it.* C. *Leverage-and act upon-behavioural analytic s.* D. *Demonstrate your commitment to providing value*		A learner shares some content in the form of text that they got from an article, and outlines the four steps a company should follow to build up customer engagement on social media *(Content Sharing).*
In response to oozz112100714		
Blog Reference: G8B7	**Learner Name:** oozz112323436	**Assessment**
I did not know about the four steps a company should follow to build up their engagement levels prior to reading this article. I now have a better understanding of it. I also would not have thought about linking customer engagement to gsmification.		A class group member acknowledged the shared content, indicating they now have a better understanding, forming/strengthening a learner-to-learner relationship *(Learner Relationships).*

Table B-43: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level

The second trend across the *Learner Relationships* cells is that the majority of relationships that were formed or strengthened were of a learner-to-learner type, which is expected in a collaborative learning environment. The *cell based trends* are presented next.

Appendix B.3.3 Cell Based Trends

Cell based trends are the trends that were observed in the learning environments relating to specific instances of a social media characteristic enabling a characteristic of collaborative learning. These are the three highest instance counts that occurred in the SMECLE evaluation framework, and these cells are:

- *"Social Interaction, Active Learning"*
- *"Content Sharing, Active Learning"*
- *"Content Sharing , Active Learning"*

Introduced next are the trends that occurred in the *"Social Interaction, Active Learning"* cell for the IS1100 SMECLE.

Social Interaction, Active Learning

A *Social Interaction* occurs when a learner makes a comment. *Active Learning* occurs by learners participating in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner discusses the task, they are participating in a constructive and iterative process of interaction, therefore actively learning, and an instance of *"Social Interaction, Active Learning"* has occurred. Depending on who acknowledges this comment, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level. The rules were set as in Table B-12 in Appendix B.1.3.

The first trend of the *"Social Interaction, Active Learning"* cell is that while there were many comments in relation to the task made by learners as evidenced in Figure B-3, the majority of these occurred at the individual level (75%), which consisted of learners making suggestions to other learners on how they could have improved their blog post, or explaining what they learnt from a particular blog post, but not getting any acknowledgment. This indicates that while learners were making comments in relation to the task, few assigned, or class group members were responding to them, as evidenced by the low counts of instances, which are 3% and 22%, respectively, and only a single discipline community group instance.

The second trend of the *"Social Interaction, Active Learning"* cell is that when learners were acknowledging comments that were in relation to the task, they were mostly class group instances as opposed to assigned group instances (see Figure B-3). That is to say, when discussing a blog post, the majority of the discussion involved learners that were not of the same assigned group, but instead consisted of learners going to other assigned groups and leaving comments. For example:

<table>
<tr><th colspan="3">Social Interaction, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G10B10</td><td>Learner Name:
oozz111337061</td><td>Assessment</td></tr>
<tr><td colspan="2">I found this post quite interesting as it really showed why management support in implementation is very important. I found it good how you tied in ideas on how to get the top management support by maybe using a bonus system.</td><td>A learner makes a comment (Social Interaction) in relation to the task on a class group member's blog post in explaining what they got from it, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to oozz111337061</td></tr>
<tr><td>Blog Reference:
G10B10</td><td>Learner Name:
oozz112323436</td><td>Assessment</td></tr>
<tr><td colspan="2">I was trying to look at IS from the management perspective in this article.</td><td>A class group member acknowledges this by making a comment (Social Interaction) in relation to the task, and explaining what they were trying to do, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the comment was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-44: An Instance of Social Interaction Enabling Active Learning at the Class Group Level

Following the trends that have been identified across *"Social Interaction, Active Learning"*, the trends observed across *"Content Sharing, Active Learning"* are presented next.

Content Sharing, Active Learning

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. *Active Learning* occurs when learners participate in a constructive and iterative process of interaction and negotiation in a problem-solving task. The assumption for this rule is that if a learner shares content in relation to the task, and makes a comment about it to show they have consumed, and understood it, they are Actively Learning, and an instance of *"Content Sharing, Active Learning"* has occurred. Depending on who acknowledges the content, the occurrence may be at an individual level, assigned group level, class group level, or discipline community group level, but other learners must also show their understanding of it to show they have consumed and understood it. The rules were set as in Table B-14 in section Appendix B.1.3.

With the most recorded instances of the entire class, the first trend of the *"Content Sharing, Active Learning"* cell is that while learners shared lots of content as evidenced in , it was very beneficial to class group members (52%), which is where the most amount of instances occurred. This indicates that when learners were sharing content, it was often getting acknowledged, further confirmed by the 10% of instances that occurred at the assigned group level also. However, there were many instances where it was only beneficial to the individual who shared the content too, with 38% of instances not receiving any acknowledgment.

The second trend of the *"Content Sharing, Active Learning"* cell is that when learners did acknowledge content that was shared, they were mainly class group instances, as opposed to assigned group, or discipline community group instances (see Figure B-3), where learners were going to other learner's blog posts, and acknowledging the content that was shared on them. For example:

<table>
<tr><th colspan="3">Content Sharing, Active Learning: Class Group Level</th></tr>
<tr><td>Blog Reference:
G12B5</td><td>Learner Name:
oozz112357106</td><td>Assessment</td></tr>
<tr><td colspan="2">A system analyst is defined as a person who “researches problems, plans solutions, recommends software and systems, at least at the functional level, and coordinates development to meet business or other requirements”.</td><td>A learner shares some content, in the form of text (Content Sharing) where they provide a definition of a systems analyst, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning).</td></tr>
<tr><td colspan="3">In response to GB oozz112357106</td></tr>
<tr><td>Blog Reference:
G12B5</td><td>Learner Name:
oozz112369636</td><td>Assessment</td></tr>
<tr><td colspan="2">After reading numerous blog posts I find this one to be very precise you are very clear in highlighting what a system analyst is and also what they do.
I am glad that I now have a good definition of what a system anaylst is and also there roles in a business.
I think you identified the system analyst as the “middle man” of a compnay very well. They have to understand and be able to communicate the needs of the business and builders of a system.</td><td>A class group member acknowledges this shared content by leaving a comment, indicating they now have a definition for a systems analyst, thus participating in a constructive and iterative process of interaction and negotiation (Active Learning). As the learner who acknowledged the content was a class group member, this instance occurred at the class group level.</td></tr>
</table>

Table B-45: An Instance of Content Sharing Enabling Active Learning at the Class Group Level

The third trend of the *“Content Sharing, Active Learning”* cell is that the dominant type of content that was shared consisted of text, where learners often based their blog post on one, or multiple articles and either provided quotes, or ideas from the article(s). Blog posts also contained other types of content, including images, videos, and links. Learners also often shared content when commenting on other blog posts. The trends across *“Content Sharing, Learner Relationships”* are presented next.

Content Sharing, Learner Relationships

Content Sharing occurs when learners share content (text, video, image, or link) that other learners can consume, and share. A *Learner Relationship* occurs from instructor-to-learner, learner-to-learner, or learner-to-instructor, where learning is multidirectional. The assumption for this rule is that if a learner or the instructor shares some content, and it is acknowledged, a relationship is formed or strengthened between the learners, and an instance of *"Content Sharing, Learner Relationships"* has occurred. Depending on who shared the content, and who acknowledges it, the relationship can be formed or strengthened at an instructor-to-learner, learner-to-learner, or learner-to-instructor level. The rules were set as in Table B-16 in Appendix B.1.3.

The first trend of the *"Content Sharing, Learner Relationships"* cell is that all of the relationships that were formed or strengthened were of a learner-to-learner type, as the instructor did not share any content, nor did any learner share content with the instructor, or the instructor acknowledge any content that was shared. Since there was a high count of learners acknowledging content that was shared, there is little surprise that there was a high rate of relationships formed or strengthened from it, which allowed content to be shared from one learner to another learner, For example:

Content Sharing, Learner Relationships: Learner-to-Learner		
Blog Reference: G14B9	**Learner Name:** oozz112375606	**Assessment**
Open Innovation as defined by Henry Chesbrough "is a move away from the traditional internally focused and essentially "closed" approach to innovation".		A learner shares some content in the form of text, where they provide a definition of open innovation *(Content Sharing).*
In response to oozz112375606		
Blog Reference: G14B9	**Learner Name:** oozz112323436	**Assessment**
You gave a definition of open innovation by Henry Chesbrough but never informed us whether you agreed with or not, do you? You gave a lot of positive aspects but are there ay negative aspects to open innovation do you think?		A class group member acknowledges this shared content, by asking them a question in relation to it, forming/strengthening a learner-to-learner relationship *(Learner Relationships).*

Table B-46: An Instance of Content Sharing Enabling Learner Relationships at the Learner-to-Learner Level