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Authors	Cosgrave, Michael
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SEMANTIC MARKUP IN DISCUSSION FORA

Dr Mike Cosgrave
School of History, University College Cork, Ireland

ABSTRACT

Discussion tools in existing LEs have few or no integrated tools to analyse student learning. This paper proposes tools not only for integrating social network analytics, but also why we need to semantically tag and track key concepts within posts in order to make student learning in discussions visible. This paper will argue for the importance of semantic markup in discussion tools using screenshots of existing LEs and UI mockups of semantically aware discussion tools to argue the case for this element of next generation LEs

KEYWORDS

Discussion, semantic, tagging, forums, visualisation

This paper has its genesis in a particular problem, tracking and making visible real student learning in a discussion in digital learning environments.

Simply stated, the initial problem is that the tools we have for managing and assessing learning in discussion forums are inadequate. Since discussion has replaced lecture at the heart of contemporary pedagogy, the lack of tools to make the flow of ideas in discussion visible is a central problem which needs to be addressed in all learning environments – virtual, personal and social.

Education is moving from behaviourist to constructivist, and from research informed teaching to research based learning. These shifts are often treated separately in literature, but happen together in practice. Discussion and interaction is at the heart of the new connectionist and constructivist pedagogy. In flipped classrooms it is important not only that students interact, but that they do so in a meaningful way. In research informed teaching, students were told about current research in a very passive way, whereas in research based teaching, we seek to involve students in the process of research. In other words, in research informed teaching, students are exposed to the outcomes of research without being exposed to the processes of research; whereas in research based teaching students are active participants in the research process, which, among other benefits, helps develop the research skills whcih are now even more nescessary to support life long learning (Wilson 2012) Discussion of research based teaching is hampered by the current perceptions of research as an activity involving expensive tools, large teams and multi-annual budgets. Two hundred years ago, when Humboldt advocated research based teaching, research was an activity conducted on a smaller, more personal scale. (Elton, 2010 p48)

Focussing on the core methods of research, research based teaching at undergraduate level is not only possible, but a logical part of our new flipped classrooms. As we seek to provide students with a research based learning environment, their interactions need to move through the phases of research – observation-thesis-antithesis-synthesis; and for this to succeed, their interactions must carry and develop real knowledge.

Discussion tools, mainly threaded forums but also other collaborative tools, carry the bulk of these interactions. Approaches to assessing student success in forums is often limited. Thus we find guidelines which focus on measurable outputs which measure behaviour like word count and quantity of posting:

> "You must post three times each week. Your first post should be an original thought with at least one secondary source. Your second and third posts should respond to two other students. Be sure to write your first post (of 500 words) by Wednesday, and at least one of your responses (of 250 words) by Friday. You will lose 5% off your participation score for this discussion for every 24-hour period that you are late. "

Source: http://www.hybridpedagogy.com/Journal/files/Discussion_Forum_is_Dead.html

This description has at least 8 easily measurable behaviorist rubrics, and only 1 qualitative indicator ("original thought"). This guidance to students creates an environment which leads to Luckin's concern that

> "The worrying view coming through is that students are lacking in reflective awareness...Technology makes it easy for them to collate information, but not to analyse and understand it. Much of the evidence suggests that what is going on out there is quite superficial" (Luckin 2008)

which agrees with Healy's warning that "Activity on its own, of course, does not bring about learning; it needs to be integrated with critical thinking,.."(Healy 2007)

There is no indication in instructions like the example above that students will be rewarded for offering synthesis, critical questioning, evaluation, testing cases by offering alternative views, or simply moving the discussion along by asking short, clear questions to clarify points. If Student C contributes a post which synthesises ideas from Student A and Student B in a single response, they have not fulfilled the requirements properly, and would have done better in this case to respond separately to Students A and B. More importantly, if Student C synthesis ideas from A and B in one response, where, in most discussion tools, do they post it? As a reply to Student A? Or to Student B? As examiner for the course, I need to be able to see where students have crossed learning thresholds, and indeed scaffold pathways to support their (Mayer & Land 2003). More importantly, as I need to make that learning visible to the students as they progress from gathering information to creating synthesis so their learning genuinely models the steps of the research process. How, in the tools we have to hand at present, can that type of interaction that creates knowledge be made visible.

The problem is magnified for the instructor guiding a discussion involving a class with, for example, 60 students working on 6 groups of 10, generating, in theory, 180 discussion posts each week.

Some work on student interactions in discussion forum has engaged with tracking interaction, but none of the leading currently available VLEs include social network analysis tools, nor is there any convenient off the shelf social network analysis tool which can be used in a diverse PLE. Current VLEs do allow monitoring of user login and activity, and offer tools to alert the course leader to students whose activity drops below set thresholds, but these give no indication of interaction.

Tools like SNAPP (Social Networks Adapting Pedagogical Practice) did permit easy social network mapping of discussion fora in Blackboard, but no longer work with current versions. SNAPP did allow course leaders to see map student interactions, seeing developing patterns in discussion over the duration of a course, identify students who were key focus points in the discussions and also identify students who were isolated on the margins of the discussions. (Bakharia, 2011) Tools like this should certainly be part of every VLE, but they do suffer from a serious limitation – they only map the external activity in the forums, but offer no means to track the internal content of the discussion contributions. It is possible that the students who become the biggest nodes in a network diagram, are contributing very little in terms of advancing the

discussion of ideas in the forum. Thus an educator who depends on social network analysis tools to monitor the 'success' of class discussions may be led astray.

Tracking the actual content of discussions should be possible by tagging posts. This also has limits. In current VLEs, post level tagging is not consistently implemented, if at all. Where it is available, the implementation is often so poor as to make it useless. While some discussion contributions may be short, and only touch single ideas, meaningful intellectual engagement requires students to develop the ability to synthesise several ideas in contributions which will often be longer – and if a post contains several ideas, the specific location of each in the post will not be clear from post level tagging. Ideally, we need to be able to tag specific sentences inside posts to mark key concepts. For completeness, we should be able to use consistent tags across set readings in course documents, students posts in discussion fora, longer student contributions in class blogs further responses in comments. In practice, no current VLE supports functionality supporting this in any way – and if it is not available inside the walled garden of a VLE, how will it work in the woods of the PLE world.

In fact, once we move away from the VLE, the possibility of tools which would allow us to track the substance of discussion in a research based learning experience are much better, but still not quite fully linked up.

The particular case which highlighted the limits of discussion spaces in current tools was a course on "War, State and Society" Key ideas running through the course are old debate about the role of technology in changing war and fostering the growth of the nation-state, and new debates about the relationship of war and culture. There are several sub-themes. The development of military historiography is an important part of the course. There are, therefore, key ideas in the course which undergraduates often find difficult. Grasping these historiographical debates is a key 'threshold concept' in their professional formation as historians and humanists.

Therefore it is important to see not only which students are active in the forums, but to see how successfully they are in locating the themes in the assigned readings and engaging with those themes in discussion. Activity on the discussion forums in not always an indicator of critical engagement. It is not sufficient to provide readings which appear to the course leader to illuminate key concepts; it is necessary to track learner pickup of those ideas and ensure that the group as a whole engage with them – it is of little use to the students if it does not become clear until the final essay that a key reading has not contributed to the desired learning goal.

Given the limitations of existing discussion tools, the only effective way to track this was by printing out the posts, sticking them to a blackboard and "tagging" them with post-it notes and chalk marker tracks to observe the flow of ideas in the discussion. With a class of 60-90 students (which exceeds the Parry Number for the maximum number of students a academic can effectively teach in a semester (Parry 2012)), even where the class was divided into groups of 10, this was difficult. In their end of course reflections, several students noted that even within their groups of 6-10, following a complex discussion in a forum was difficult. If some students noted this explicitly, it is likely that many more had a problem.

There was no tool which would allow me to make visible to the students how in their own discussions they were developing skills of academic debate which are a key skill in all disciplines. It was possible to show students research on how academics read primary documents (Wineburg 2001) and to model that reading both in mindmapping of interpretive articles and with short videos of screen captures of close reading and markup of primary source documents. It was also possible to create collaborative maps of student reading and discovery of common themes from a range of primary texts on the whiteboard during in class discussion. No digital tool was available which would allow easy visual mapping of the students developing debate on key themes in a way which would make explicit to them how they were developing a

synthesis of the course material. It became clear that there is a need to a tool which allows shared annotation of ideas across multiple texts which could be integrated in all learning environments.

There are any number of tools which allow several users to annotate a single document, and share those annotations over the web. Everything from Google Docs to Kindle allow multiple users to comment on a single document, and to share those comments. They do not, however, allow tracking of a single concept across multiple documents. There are a range of tools which do allow tagging of multiple documents and sharing those texts among a learning community. Evernote and similar tools can be used to gather a range of learning resources, organise them, tag them as whole units (but not tag parts of them) and share them with a community. Zotero, although originally designed as a bibliographic tool, can be used to gather learning resources, add tags and reading notes and share them in a group library. In theory, standalone notes in Zotero can be used as a “Discussion forum” and loosely threaded using by tagging the notes. However, while notes can have multiple tags, tags cannot point to a specific point in the note in the way that comments in a Kindle text do. Diigo, a web annotation tool, does allow highlighting and commenting on specific parts of a web page, and does allow learners to share annotated pages, and conduct discussions in groups. However, the default tagging is at document level, which does not make easily visible where individual concepts occur within the document. Highlighting and 'sticky notes' provide a limited substitute. Many of these tools provide API level access, but some are proprietary tools which impose costs on learners, provide patchy or limited export options and may disappear or be taken over. If a learners Personal Learning Archive is to be a persistent, stable collection which supports life-long learning; the limits of closed, proprietary tools are not acceptable.

Therefore, as we look to the design of our next generation of learning environments, which need to be both personal and social, and persistent, there is a need to address the problem described here by creating tools which will allow for

Highlighting, annotation and tagging within all documents (clipped from web, pdf, user discussion posts etc)

Network mapping of interactions in learning group by user and by semantic tags

Visualisations of developing concept maps (possibly though integration of XML based mind-mapping tools)

The front-end client should include a tool to highlight, annotate and apply conceptual tags to any resource. This might look very similar to the tagging facility in social bookmarking tools like Diigo. To allow for planning of discussion activities, and to simplify group and class based visualisation of discussions, the backend should allow for granularity in setting visibility of annotations and tags. It would be important not only that student postings could be tagged by the teacher, but also that students should be able to tag each others postings. The backend would then need to record the resource annotated, date annotated, user applying the annotation, start and end points of annotation, semantic tags which could be implemented in either SQL or XML databases. Visualisations of the developing discussion could be retrieved by a simple query extracting annotations or highlights by tag, and passing that to a visualistion tool.

This functionality would allow us to move beyond the current, limited hierarchal structure of discussion tools, which is limited to see which student replies to whom, and both see and make visible to learners the web of ideas flowing though a discussion from initial gathering and sharing of data to the creation of a synthesis. At the moment, we do not have to tools to support this understanding goal which is central to developing the higher order skills inherent in academic debate.

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