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Learning Outcomes and Competences





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Abstract

There is wide variation in the literature regarding the interpretation of the meaning of the term competence. This interpretation ranges from a description of competence in terms of performance and skills acquired by training to a broad overarching view that encompasses knowledge, understanding, skills, abilities and attitudes. Due to the lack of clarity of the concept of competence, assessment of competences can be very difficult. Some authors warn against associating competence exclusively with skills, others distinguish between the terms competence and competency whilst others treat these terms as being synonymous. The essential problem appears to be that these terms are liberally used as general terms to refer to various aspects of job performance without any attempt being made to give precise definitions of the terms. While various efforts have been made to arrive at a single definition of the term competence, no agreement has been reached and there is still wide variation of meaning between various cultures and between different professions. This is in contrast to the clear definition of the concept of learning outcomes found in the literature. It is recommended that if the term competence is being used, the definition of competence being used in the particular context should be stated and also that competences should be written using the vocabulary of learning outcomes.

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The relationship between learning outcomes and competences is a complex area – the subject of some debate and no little confusion.

Adam, 2004

1. Competence – attempts to define it

There is considerable confusion in the literature with regard to the meaning of the term *competence* and the relationship between competences (also written as competencies) and learning outcomes. This article attempts to bring some clarity to this area by surveying the literature on this topic and by making some recommendations on the use of the concept of competence.

No single definition of concept of competence

It is difficult to find a precise definition for the term competence. The situation is nicely summarised by Winterton et al (2005) as follows:

> *There is such confusion and debate concerning the concept of "competence" that it is impossible to identify or impute a coherent theory or to arrive at a definition capable of accommodating and reconciling all the different ways that the term is used.* (Winterton et al., 2005)

Adam (2004) comments that "some take a narrow view and associate competence just with skills acquired by training". This point is echoed by Brown and Knight (1995) who state that "competence probably replaces, albeit at a more sophisticated level, the concept of skills. That doesn't necessarily make it easier to understand what competencies are, let alone how they are to be recognised". The UK Training Agency (1989) defines competence as:

> *Standards development should be based on the notion of competence which is defined as the ability to perform the activities within an occupation. Competence is a wide concept which embodies the ability to transfer skills and knowledge to new situations within the occupational area. It encompasses organisation and planning of work, innovation and coping with non-routine activities. It includes those qualities of personal effectiveness that are required in the workplace to deal with co-workers, managers and customers.* (Training Agency UK, 1989)

Attributes, abilities and attitudes

ECTS Users' Guide (2005) takes a very broad view of the term competence and describes competence as "a dynamic combination of attributes, abilities and attitudes. Fostering these competences is the object of educational programmes. Competences are formed in various course units and assessed at different stages. They may be divided

in subject-area related competences (specific to a field of study) and generic competences (common to any degree course)". The problem with this definition of competences is that it is so general that it is difficult to describe the concept of competence with any form of precision. The concept of competence is further discussed in the latest edition of the ECTS Users' Guide (2009):

> *The European Qualification Framework for LLL instead distinguishes knowledge, skills and competence. It uses the following definition: "competence means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy". In this case the term competence is understood in a more limited way, as the capacity to transfer knowledge into practice.* (ECTS, 2009)

The narrow and the broad view

Thus, the concept of competence is described in both a broad and narrow sense. Similarly, Miller et al (1988) when discussing competence in nursing suggests that there are two senses in which competence can be defined. Firstly, they take a narrow view and equate competence with performance, i.e. the ability to perform nursing tasks. Secondly, the authors take a broader view of competence in terms of a "psychological construct", requiring evaluation of the ability of the nurse to integrate cognitive, affective and psychomotor skills when delivering nursing care. Miller et al (1988) also point out that "competence is over defined since there are almost as many definitions of the concept as there are users of the term". Wolf (1989) expresses the view that competence refers to the "ability to perform at the standards expected of employees" and that statements of competence "specify the nature of the particular performable occupational role or roles" which can be very narrow or encompass a wide range of different roles. She argues that competence is not something that can be observed directly but is a construct of a number of different areas.

Application of knowledge and skills

The Higher Education and Training Awards Council of Ireland (HETAC) takes a broad view of the term competence and describes competence in terms of the demonstration and application of knowledge and skills in human situations:

> *The unique characteristic of competence is the effective and creative demonstration and deployment of knowledge and skill in human situations. ... Competence refers to the process of governing the application of knowledge to a set of tasks and is typically acquired by practice and reflection. Some aspects of performance in situations may depend on innate characteristics of an individual. In as much as such performance is not learned it cannot be recognised as learning. Competence also encom-*

> *passes the extent to which the learner can acknowledge his/her limitations and plan to transcend these through further learning.* (HETAC, 2006)

In addition to describing competences in general terms for use in the National Framework of Qualifications of Ireland, HETAC also categorises competences into a number of different areas which may be summarised as follows:

Categories of competences

- **Competence – context**. The HETAC publication describes this competence in terms of human situations, whether occupational or general social and civic ones, supplying the context within which knowledge and skills are deployed for practical purposes. Acting effectively and autonomously in complex, ill-defined and unpredictable situations or contexts requires higher levels of learning.

- **Competence – role**. HETAC describes this competence in terms of the fact that when an individual joins a group, he or she is required to adopt appropriate roles within the group. This requires the application of social skills and an understanding of the tasks of the group. Higher levels of competence are associated with playing multiple roles as well as with roles requiring leadership, initiative and autonomy. Higher competence is also associated with participation in more complex and internally diverse groups.

- **Competence – learning to learn**. HETAC describes this competence as encompassing the extent to which an individual can recognise and acknowledge the limitations of his/her current knowledge, skill and competence and plan to transcend these limitations through further learning. Learning to learn is the ability to observe and participate in new experiences and to extract and retain meaning from these experiences.

- **Competence – insight**. This competence is described by HETAC as referring to the ability to engage in increasingly complex understanding and consciousness, both internally and externally, through the process of reflection on experience. The competence of insight involves the integration of the other strands of knowledge, skill and competence with the learner's attitudes, motivation, values, beliefs, cognitive style and personality.

Evidence of being competent

Neary (2002) points out that the various definitions of competence are not very specific but felt that they gave some sort of indication of what was expected in terms of sources of evidence of being competent. He states that the term competence is a broad one and embraces a number of areas:

> *It would be pointless to suggest that there is a single definition. Competence includes a broad range of knowledge, attitudes and observable patterns of behaviour which together account for the ability to deliver a specified professional service. The competent individual can correctly perform numerous (but not necessarily all) tasks, many of which require knowledge, theories, principles of social sciences or comprehension of the social and cultural factors that influence the climate. Competence in this sense also involves adoption of a professional role that values human life.* (Neary, 2002)

A project entitled *Tuning Educational Structures in Europe* was initiated in 2000 (Tuning, 2000). In this project, the term competence is defined as follows:

> *Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competences is the object of educational programmes.* (Tuning, 2000)

The Tuning Project describes three types of generic competences:

Generic competences

- Instrumental competences: cognitive abilities, methodological abilities, technological abilities and linguistic abilities.
- Interpersonal competences: individual abilities like social skills (social interaction and co-operation).
- Systemic competences: abilities and skills concerning whole systems (combination of understanding, sensibility and knowledge; prior acquisition of instrumental and interpersonal competences required)

Examples of generic competences described in the Tuning project are: the capacity for analysis and synthesis, the capacity to learn and problem solving, the capacity for applying knowledge in practice, the capacity to adapt to new situations, concern for quality, information management skills, ability to work autonomously, capacity for organising and planning, oral and written communication in native language and interpersonal skills. In a questionnaire developed by the Tuning Project for academics, respondents were asked to rank in order of importance the 17 generic competences in Handout B 2.3-3-1.

Generic Competences proposed in Tuning Project

1. Ability to work in an interdisciplinary team
2. Appreciation of diversity and multiculturality
3. Basic knowledge of the field of study
4. Basic knowledge of the field of the profession
5. Capacity for analysis and synthesis
6. Capacity for applying knowledge in practice
7. Capacity for generating new ideas (creativity)
8. Capacity to adapt to new situations
9. Capacity to learn
10. Critical and self-critical abilities
11. Decision making
12. Elementary computing skills (word processing, database, other utilities)
13. Ethical commitment
14. Interpersonal skills
15. Knowledge of a second language
16. Oral and written communication in your native language
17. Research skills

Handout B 2.3-3-1 Generic Competences (Tuning Project)

Assessment of competences

One is immediately struck by the fact that many of these competences are of such a general nature that it is difficult to understand what is meant by them. Without this clarity, assessment of these competences would be extremely difficult if not impossible. In addition, there does not appear to be any rules or guidelines for the writing of competences – some of the above competences are written in terms of “ability”, some in terms of “capacity”, others are written in terms of skills and commitment whilst others are written in terms of knowledge.

2. Competence – inclusive of the broad and narrow view

Conceptual framework

In discussing a conceptual framework of professional competency, Jarvis (1985) suggests that analysis of the concept of competency could help to provide a basis on which a curriculum could be constructed and suggests that this would have three components:

1. Knowledge and understanding of relevant academic disciplines, psychomotor elements, interpersonal skills, moral values.

2. Skills to perform the psychomotor techniques, interact with members of the role.

3. Attitudes that result in a knowledge and commitment to professionalism, a willingness to play the role in a professional manner.

Neary (2002) is in agreement with the above description and points out that "practitioners and teachers argue that competence is more than knowledge and skills. Values, critical thinking, professional judgement, formulation of attitudes, the integration of theory from the humanities and the sciences are also competencies."

The competences expected of newly qualified teachers in England and Wales is discussed by Capel et al (1997). It is clear from the published list of competences that the Department of Education and the Welsh Office (1992) takes both a broad and narrow view of the term competence, Handout B 2.3-3-2.

Subject Knowledge

Newly qualified teachers should be able to demonstrate:

- An understanding of the knowledge, concepts and skills of their specialist subjects and of the place of these subjects in the school curriculum.
- Knowledge and understanding of the National Curriculum and attainment targets and the programmes of study in the subjects they are preparing to teach, together with an understanding of the framework of the statutory requirements.
- A breadth and depth of subject knowledge beyond programmes of study and examination syllabuses in school.

Competences with a narrow and broad focus

Subject Application

Newly qualified teachers should be able to:

- Produce coherent lesson plans which take account of National Curriculum and attainment targets and of the school's curriculum policies.
- Ensure continuity and progression within and between classes and in subjects.
- Set appropriately demanding expectations for pupils.
- Employ a range of teaching strategies appropriate to the age, ability and attainment levels of pupils.
- Present subject content in clear language and in a stimulating manner.
- Contribute to the development of pupils' language and communications skills.
- Demonstrate ability to select and use appropriate resources, including Information Technology.

Class Management

Newly qualified teachers should be able to:

- Decide when teaching the whole class groups, pairs or individuals what is appropriate for particular learning purposes. Create and maintain a purposeful and orderly environment for the pupils.
- Devise and use appropriate rewards and sanctions to maintain an effective learning environment.
- Maintain pupils' interest and motivation.

Handout B 2.3-3-2 **Some examples of competences expected of newly qualified teachers in England and Wales** (Department for Education and the Welsh Office, 1992)

Competences and learning outcomes

It is clear that some of the competences listed above are statements of a general nature (e.g. "demonstrate understanding of the knowledge, concepts and skills) and other are learning outcomes (e.g. "produce lesson plans ….."., "present subject content..."). Thus, competences with a narrow focus can be written as learning outcomes.

The confusion caused by using the term competence as a broad term as well as a narrow term is apparent in the description of competence put forward by Dooley et al. (2004): "Competency-based behavioural

anchors are defined as performance capabilities needed to demonstrate knowledge, skill and ability (competency) acquisition". As Winterton et al. point out (2005), this definition means that competency is a subset of itself!

Competence a "fuzzy concept"

While van der Klink and Boon (2002) describe competence as a "fuzzy concept" nevertheless they suggest that it is a "useful term, bridging the gap between education and job requirements". They express the opinion that in the UK the term competence appears to refer to the performance standards for functions and professions such as those developed for National Vocational Qualifications. The same authors also point out that in the USA the term competence refers to the "skills, knowledge and characteristics of persons,that is traits, motives and self-concept which contribute to performance excellence" (Van der Klink and Boon. 2003). Thus, the interpretation of the term competence appears to depend not only on the views of the authors discussing it but also varies from country to country.

Many of the careers in which the concept of competence appears to be used are in the vocational area, e.g. nursing, teaching and social work. The concept of competence is often embedded into requirements for recognition of qualifications or membership of a licensing organisation. Frequently, competence is measured by assessing some type of "performance" in the workplace. However, van der Klink and Boon warn against associating competences exclusively with skills:

> *Staff members are not always too willing to adopt the notion of competency-based education. Teachers are concerned that competencies will result in an exclusive focus on vocational skills and this might lead to an underestimation of reflective and/or academic competencies in the curricula*
>
> (Van der Klink and Boon, 2002)

3. Competence and competency

The same meaning or different meanings?

Some authors (Boam and Sparrow, 1992; Hendry, Arthur and Jones 1995; Mitrani, Dalziel and Fitt, 1992; Smith, 1993) use the term competency (plural competencies) when referring to occupational competences. For examples, Mitrani et al (1992) refer to competency as "an underlying characteristic of an individual which is causally related to effective or superior performance in a job". However, other authors treat the terms competence and competency as being synonymous (Brown, 1993, 1994; McBeath, 1990).

In fact, McBeath (1990) refers to the term competencies as "relatively new jargon" and states that the word did not feature in the indexes of

most management development books published up to 1986. Hartle (1995) describes competency as "a characteristic of an individual that has been shown to drive superior job performance" and refers to visible competencies of knowledge and skills as well as underlying elements of competencies such as characteristics and motives. He summarises his view of the term competencies by stating that "competencies describe what make people effective in a given role". Elkin (1990) associates competences with micro-level job performance and competencies with higher management attributes. Cockerill (1989) describes output competences such as effective presentation skills, with input competencies such as self-confidence (Winterton et al., 2005).

Van der Klink and Boon (2002) attempt to trace the different interpretations of the concept of competence within the educational systems of various countries:

Different interpretations in different countries and educational systems

> *There is considerable confusion about what competency actually means… First, differences can be observed between nations along the lines of different national educational policies and different types of relations between education and the labour market, many of which have an historic origin. In the British approach it refers to the ability to meet the performance standards for functions and professions such as those developed for National Vocational Qualifications (NVQs) in the UK. In the USA, competencies refer to the skills, knowledge and characteristics of persons, that is traits, motives and self-concept, which contribute to performance excellence. These differences are evident even in the words themselves: competences (UK) and competencies (USA). To put it simply: competences refer to work and its achievement; competencies concern the people who do the work….. More than in the UK or the USA, the German perspective stresses a holistic view of competency. It is not just a random collection of skills and knowledge. Competencies are defined as integrated action programmes that enable individuals to perform adequately in various job contexts within a specific profession* (Van der Klink and Boon, 2002)

Umbrella term

This theme is also discussed by a number of other authors. Burgoyne (1988) distinguishes "being competent" (meeting the demands of the job) from "having competencies" (possessing the necessary attributes to perform competently). Woodruffe (1991) describes competency as "an umbrella term to cover almost anything that might directly or indirectly affect job performance". He attempts to distinguish between competence and competency by describing competence as aspects of the job which an individual can perform with competency referring to a person's behaviour that underpins competent performance.

> *Having arrived at a definition of competency it is important to differentiate it from competence. An essential distinction is between aspects of the job at which the person is competent and aspects of the person that enable him or her to be competent…..Competencies are different from aspects of the job. They are what the person brings to the job….Competencies are dimensions of behaviour which are related to superior job performance. They are ways of behaving that some people carry out better than others.* (Woodruffe, 1991)

Tate (1995) agrees with Woodruffe's general description of competency and warns against confusing "input competencies with output competences".

Whilst the terms "competence" and "competency" are open to different interpretations, there is general agreement that an individual who has the necessary knowledge, skills and attitude may be described as being competent in their particular occupation.

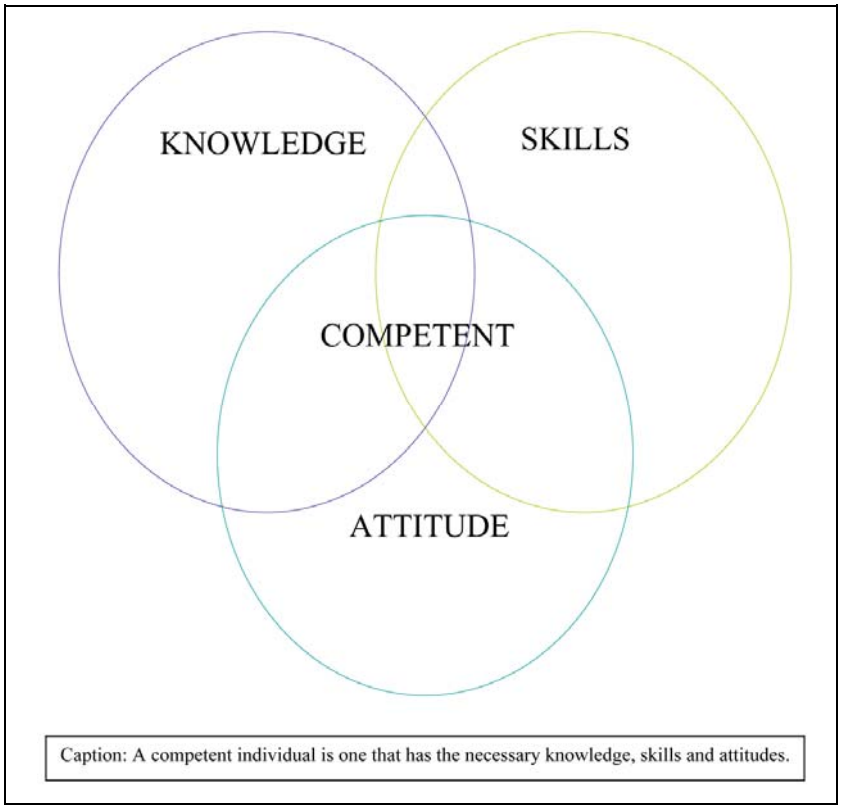


Fig. B 2.3-3-1 The concept of being competent

4. Relating competences, objectives and learning outcomes

The relationship between competences, objectives and learning outcomes is discussed by Hartel and Foegeding (2004). In this paper they define competence as "a general statement detailing the desired knowledge and skills of students graduating from our course or program". As an example of a competence in the area of food engineering and processing they give the following example: *The student should be able to use the mass and energy balances for a given food process*. Arising from this competence Hartel and Foegeding derive two objectives and four learning outcomes. These are summarised in Fig. B 2.3-3-2.

Relating competences, objectives and learning outcomes

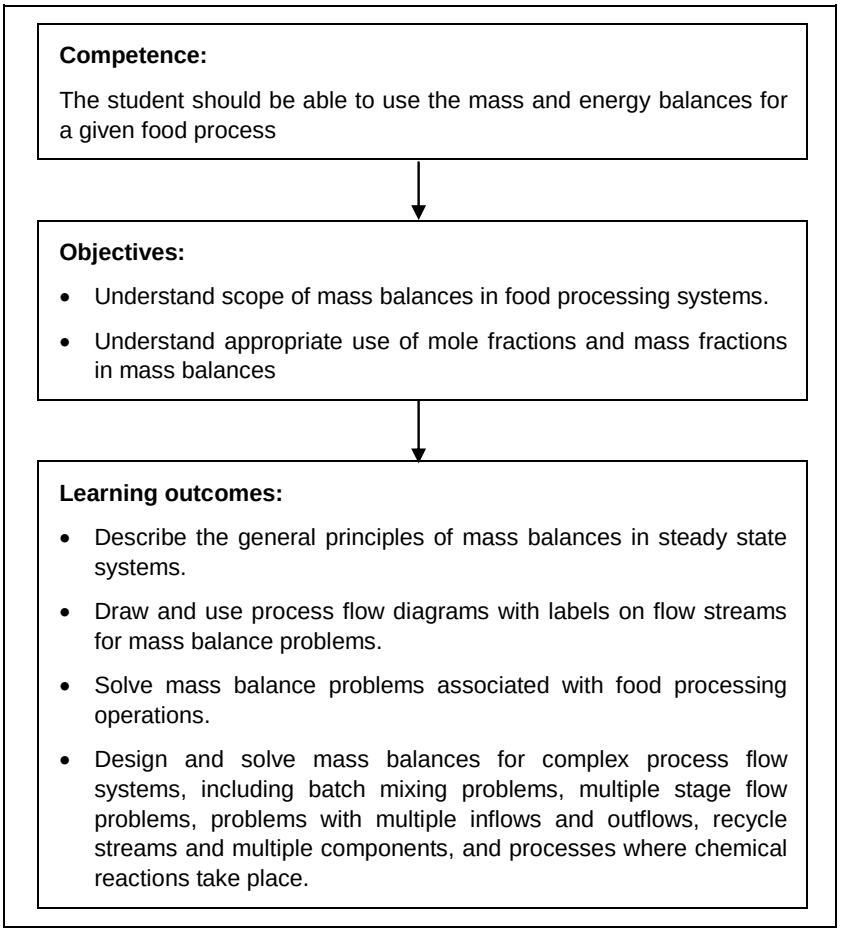


Fig. B 2.3-3-2 **An example showing the relationship between competence, objectives and learning outcomes in the area of food engineering** (Hartel and Foegeding, 2004)

From the above example of a competence, it is clear that the learning outcomes written by Hartel and Foegeding specify precisely what it is expected that the students will be able to do in order to demonstrate that they have acquired this particular competence. This point is echoed by Neary (2002) when discussing the area of teaching for competence who points out that the challenge for the teacher is to "select appropriate learning outcomes which will lead to achieving the competencies, specify evaluation indicators and develop a functional delivery system".

5. Competence within a specific profession

Competence in the dental profession

It is helpful to understand the concept of competence if we consider an example of this competence being used in one particular profession, e.g. the dental profession. This is discussed in some detail by Oliver et al. (2008). The definition of competence quoted by Oliver et al. is that put forward by Chambers (1994) and is stated as follows:

> *"Chambers has provided a useful definition of competence: The behaviour expected of beginning independent practitioners. This behaviour incorporates understanding, skills, and values in an integrated response to the full range of circumstances encountered in general professional practice. This level of performance requires some degree of speed and accuracy consistent with patient well being but not performance at the highest level possible. It also requires an awareness of what constitutes acceptable performance under the circumstances and desire for self-improvement".* (Oliver et al., 2008)

Competence supported by learning outcomes

It is interesting to note that Oliver et al. do not appear to distinguish between the terms **competence** and **competency** as the definition of competence that they quote is from a paper discussing competency. Oliver et al (2008) go on to describe competences as broad statements that outline the knowledge, skills and attitudes of the new graduate. They also state that competences may be considered similar to aims and may be supported by learning outcomes. They point out that assessment of competence does not just relate to skill but also requires appropriate knowledge and attitudes, including self awareness, i.e. an ability to recognise personal strengths and weaknesses. They describe the link between competences and learning outcomes as follows:

> *Learning outcomes support the competences, are at a greater level of detail and form the basis of both learning and assessment. Properly constructed, competences and learning outcomes are precisely formulated to indicate what the students should know about, what the students should understand, and*

> *what the students should be able to do and how well, using language and context that indicates the level at which they will be assessed.* (Oliver et al., 2008)

Competence – avoiding items that are difficult to measure

When summing up, Oliver et al. (2008) recommend that the curriculum should have a number of features, among which are that it should be competency and outcome based. Chambers takes up this point when discussing the concept of competencies within the profession of dentistry. He describes competencies in terms of what dentists do on a regular basis to meet patients' needs. He discusses competencies in terms of psychomotor skill performance and understanding of what is being done and supported by professional values. He highlights the problem of inferring general capacity to perform based on specific samples of behaviour and explains how the profession of dentistry has approached this problem:

> *Dentistry has tended to solve this problem by emphasising the mechanical and the detailed while avoiding those things that are difficult to measure… Competencies is a comfortable term that finds its way into conversation when a general word is needed referring to good dentistry. I have never met anyone who is against competent dentists. But it is also difficult to be precise about what exactly that means.* (Chambers 1994)

In short, whilst the term competence or competency is used within certain professions, even within these professions it can be difficult to state precisely what is meant by these terms.

6. Conclusions and Recommendations

It is clear that there is no single definition of the term competence. Descriptions of the term competence range from that of a broad overarching attribute to that of a very specific task. The situation is nicely summarised by Brown (1994) when discussing the use of the term in the context of managerial competence:

Competence – "an ill-defined concept"

> *One of the reasons for the debate about the usefulness of managerial competence may be the soft focus and blurred edges of the term "competence". Social science has the habit of taking a word from our common vocabulary and altering the meaning by its adoption as a technical or academic term. This process is still happening to "competence" and a common consensus has yet to be established as to what the word should mean when used in management applications.* (Brown, 1994)

The above conclusion is echoed by van der Klink and Boon (2003) when discussing the "fuzzy concept" of competences:

> *The fact that the concept of competencies serves as a remedy for solving rather different problems probably has to do with its diffuse nature. It is actually an ill-defined concept with no clear content, thus allowing ample interpretations. This major vagueness is partly caused by the application of the concept in various countries, different settings and for different purposes. Its vagueness is probably at the same time the explanation for its prominent status today but it makes it difficult to use the concept as a sound cornerstone for designing HRD [Human Resource Development] and educational practices.*
>
> (Van der Klink and Boon, 2003)

The confusion and vagueness in the use of the term competence is in contrast with the clear definition of the concept of a learning outcome found in the literature (ECTS 2009, Kennedy et al. 2006, Kennedy 2007). In concluding their article on competencies, van der Klink and Boon (2003) address the question of research in this area and they "encourage researchers to unravel the fuzzy concept of competencies!". This is a formidable task due to the lack of clarity associated with the term and also the lack of any clear guidelines on how they should be written. In contrast to this, the guidelines for writing learning outcomes are very clearly laid out in the literature.

Avoiding confusion when using the term competence

Given the considerable confusion about the concept of competence in the literature, if this term must be used, then its meaning needs to be clearly defined for the context in which it is being used. It is obvious from the literature that within certain professions, the term competence has a shared meaning. Hence, there is no problem with using the concept of competence since there is a common understanding of its meaning among the members of that profession. The problem arises when the term competence is used in a general context without defining what is meant by the term. Therefore, in order to avoid confusion it is recommended that when using the term competence, the following guidelines should be followed:

1. State the definition of competence that is being used in the particular context.

2. To ensure clarity of meaning, write competences using the vocabulary of learning outcomes, i.e. express the required competence in terms of the students achieving specific programme learning outcomes or module learning outcomes.

Since there is not a common understanding of the term competence, learning outcomes have become more commonly used than competences when describing what students are expected to know, understand

and/or be able to demonstrate at the end of a module or programme. The "fuzziness" of competences disappears in the clarity of learning outcomes!

References

[1] Adam, S. (2004): *Using Learning Outcomes: A consideration of the nature, role, application and implications for European education of employing learning outcomes at the local, national and international levels.* Report on United Kingdom, Bologna Seminar, July 2004, Herriot-Watt University.

[2] Boam, R. and Sparrow, P. (Eds) (1992): *Designing and achieving competency*, London: McGraw-Hill

[3] Brown, R.B. (1993): Meta-competence: a recipe for reframing the competence debate, in *Personnel Review*, 22(6) pp 25-36.

[4] Brown, R.B. (1994): Reframing the competency debate: management knowledge and meta-competence in graduate education, in *Management Learning*, 25(2) pp 289-99.

[5] Burgoyne, J. (1988a): *Competency Based Approaches to Management Development, Lancaster*: Centre for the Study of Management Learning.

[6] Capel, S, Leask, M and Turner, T (1997):*Learning to Teach in the Secondary School*. London: Routledge.

[7] Chambers, D.W. (1994): Competencies: a new view of becoming a dentist *in J Dent Education* (58) pp 342-345

[8] Cockerill, T. (1989): The kind of competence for rapid change, in *Personnel Management*, September, 52-56

[9] Dooley, K. E., Lindner, J. R., Dooley, L. M. and Alagaraja, M. (2004): Behaviorally anchored competencies: evaluation tool for training via distance, in *Human Resource Development International*, 7(3) pp 315-332.

[10] Elkin, G. (1990): Competency-based human resource development, *in Industrial and Commercial Training*, 22(4) pp 20-25

[11] ECTS Users' Guide (2009): available at: http://ec.europa.eu/education/lifelong-learning-policy/doc/ects/guide_en.pdf

[12] Hartel, .R.W. and E.A. Foegeding (2004): Learning: Objectives, Competencies, or Outcomes, in *Journal of Food Science Education*, (3) 69 – 70.

[13] Hartle, F. (1995): *How to re-engineer your Performance Management Process*, London: Kogan Page

[14] Hendry, C., Arthur, M.B. and Jones, A.M. (1995): *Strategy through People: Adaptation and Learning in the Small-Medium Enterprise*, London: Routledge.

[15] HETAC (2006): *Explanatory Guidelines on the Direct Application to HETAC for a Named Award*, Dublin: Higher Education and Training Awards Council.

[16] Jarvis, P. (1985): *The sociology of adult and continuing education*, London: Croom Helm.

[17] Kennedy, D. (2007): *Writing and Using Learning Outcomes: A Practical Guide*, Cork: Quality Promotion Unit, University College Cork: http://www.nairtl.ie/

[18] Kennedy, D, Hyland, A and Ryan N. (2007): Writing and using learning outcomes: A practical guide, in *Froment, E, Kohler J, Purser L and Wilson L (eds.): EUA Bologna Handbook – Making Bologna Work, article C 3.4-1* (Berlin: Raabe Verlag)

[19] McBeath, G. (1990): *Practical Management Development: Strategies for Management Resourcing and Development in the 1990s*, Oxford: Blackwell

[20] Miller, C, Hoggan, J., Pringle, S. and West, C. (1988): *Credit Where Credit's Due*. Report of the Accreditation of Work-based Learning Project. Glasgow. SCOTVEC.

[21] Mitrani, A., Dalziel, M and Fitt, D. (1992): *Competency Based Human Resource Management*, London: Kogan Page.

[22] Neary, M. (2002): *Curriculum studies in post-compulsory and adult education*. Cheltenham: Nelson Thornes.

[23] Oliver et al (2008): Curriculum structure: principles and strategy, *in European Journal of Dental Education.* (12) 74 – 84.

[24] Smith, B. (1993): Building managers from the inside out: competency based action learning, in *Journal of Management Development*, 12, 1: 43-8

[25] Tate, W. (1995): *Developing Managerial Competence: A Critical Guide to Methods and Materials*, London: Gower.

[26] Training Agency (1989): Development of Accessible Standards for National Certification Guidance, *in Note No.1, Sheffield Employment Department/Training Agency.*

[27] Tuning Educational Structures in Europe (2000): *http://tuning.unideusto.org/tuningeu/*

[28] Van der Klink, M and Boon, J. (2002): Competencies: The triumph of a fuzzy concept, in *International Journal Human Resources Development and Management* 3(2), pp 125 – 137.

[29] Winterton J, Delamare-Le Deist F and Stringfellow E (2005): *Typology of knowledge, skills and competences: clarification of the concept and prototype*. CEDEFOP: Tolouse: http://www.ecotec.com/europeaninventory/ publications/method/CEDEFOP_typology.pdf

[30] Wolf, A. (1989): *Can competence and knowledge mix*?, in J. W Burke (ed). Competency-based Education and Training. Lewes: Falmer Press.

[31] Woodruffe, C. (1991): Competent by any other name, in *Personnel Management*, September, 30-31.

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