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Approaches to learning in higher education: A review

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ABSTRACT

The concept of approaches to learning (deep, surface and strategic) has been influential in higher education research, policy and practice, particularly, in the world's leading universities. In this review, published international research investigating the relationship between approaches to learning and educational outcomes in higher education is evaluated. There is evidence that deep approaches to learning are associated with a deep understanding of educational material but not conclusively high academic achievement (as measured by assessment results). This may be because the assessment methods adopted by higher education institutions do not always reward deep learning. It is recommended that higher educational institutions in sub-Saharan Africa aim to encourage students to develop a deep approach to learning, leading to a deep understanding of subject matter. This can be achieved through the incorporation of well organised curricula and teaching and assessment methods that promote deep understanding, such as, essay writing, problem based learning, inquiry based learning, reflective learning and research projects.

Keywords: Approaches to learning, assessment, educational outcomes, higher education, sub-Saharan Africa.

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INTRODUCTION

The concept of approaches to learning (deep and surface) originated from a study carried out by researchers Marton and Saljo at the University of Gothenburg, Sweden in the 1970s (Marton and Saljo, 1976a). The fundamental aim of their research was to investigate differences in learning processes amongst students in higher education. Marton and Saljo used a phenomenography approach; a research method that involves obtaining descriptions of peoples experiences and performing qualitative analysis to categorise and examine relationships between them (Marton and Saljo, 2005). In their study, volunteer higher education students were recruited and provided with reading material which they were instructed to learn before being given questions to answer on the content. The students' answers to the questions helped the researchers ascertain the students' depth of understanding of the reading material. Furthermore, the students were asked questions about the process of their learning. The researchers compared the students' responses about their learning process with their level of understanding of the reading material and found that there was a relationship between them. Based on their work, Marton and Saljo were able to describe two approaches to learning which they called surface level processing and deep level processing. In surface-level processing, the students had the intention of memorising the text itself and not necessarily understanding it, they were described as adopting a rote learning strategy. Students who engaged in deep level processing had the intention of trying to really understand the line of reasoning and arguments made by the author, they engaged with the text in an active and reflective way. Through understanding these students were able to remember the contents of the text. Surface level processing was found to be associated with a low level of understanding and hence a poor learning outcome whilst deep level processing was associated with a deep level of understanding and consequently a good learning outcome.

Noel Entwistle the director of a research programme investigating learning processes considered the term 'levels of processing' too constricting in relation to learning differences and favoured the term 'approaches to learning'. Approaches to learning; deep approach and surface approach have since become widely accepted terms in the educational psychology literature (Marton and Saljo, 2005).

Entwistle (1987) described a third learning approach called the strategic approach in which the student's intention is to obtain the highest possible grade (Entwistle, 1987). Students who adopt this approach are likely to predict exam questions using previous exam papers, pay attention to clues about marking schemes and assessment questions and organise their time and intellectual resources effectively. Students who take a strategic approach to their learning may move between a deep and surface approach depending on their perception of what is required of them in the assessments (Diseth and Martinsen, 2003).

It has been reported that the approach a learner takes to their learning is not fixed but may depend on the context of the learning, motivation and cognitive style of the learner (Marton and Saljo 1976b; Fransson, 1977; van Rossum and Schenk, 1984; Dahlgren, 2005).

The 'approaches to learning' theories have been highly influential in higher education research, policy and practice, particularly, in world class universities. In this review, international research investigating the association between approaches to learning and educational outcomes in higher education are explored with the aim of making recommendations for educational policy and teaching practices in African Universities.

EDUCATIONAL OUTCOMES

Learning in higher education can be described as a multi-factorial and complex phenomenon. Just as there are a wide variety of subjects to learn about there are also a wide variety of factors that influence educational outcomes (Dahlgren, 2005). Educational outcomes in higher education could refer to the level of understanding of a subject, conceptual changes that occur as a result of learning, cognitive adaptation (assimilation and accommodation of schemata), acquisition of subject specific knowledge and terminology, problem solving and critical thinking ability, as well as examination results and in a wider context competence in future employment.

Structure of Observed Learning Outcomes (SOLO) taxonomy is also applicable to the examination of educational outcomes in higher education (Biggs and Collis, 1982). SOLO taxonomy provides a 5 level structural model of the outcomes of learning and how they develop in intricacy from surface level understanding to deep level understanding (Watkins, 1983; Krathwohl 2002; Svensson, 1977).

DO LEARNING APPROACHES EXPLAIN EDUCATIONAL OUTCOMES?

The work of Marton and Saljo (1976, described in 2005) provides evidence that surface approaches to learning result in the acquisition of a superficial level of knowledge that lacks depth of understanding whilst the deep approach to learning results in profound understanding of educational content. Their work provides a valid insight into the relationship between approaches to learning and learning outcomes, however, relating their findings to the real life multi-factorial nature of higher education learning practices and outcomes may be complex. Their study lacked the real life examination pressures and academic consequences of failure faced by many students, were based on a relatively small volume of learning material in comparison to what a student may have to learn on a higher education course and were carried out within one subject discipline and within one cultural context.

With an awareness of the aforementioned criticisms Watkins (1983) carried out a study investigating relationships between learning processes and learning outcomes by analysing the actual work that students were doing across three different university faculties. SOLO taxonomy was used to assess the quality of the learning outcome. The results of the study provided evidence to support the hypothesis that depth of processing is related positively to the quality of the learning outcome. Svensson (1977) reported findings that were in accordance with Marton and Saljo (1976a) but used different terminology; holistic and atomistic approaches as opposed to deep and surface approaches to learning respectively. In an American study by Schmeck and Grove (1979) it was shown that deep processing correlated with higher academic achievement in terms of grade point average (GPA). On the other hand, a study by Diseth and Martinsen (2003) exploring the association between learning approaches and academic achievement in undergraduate psychology students reported that a deep approach to learning was not associated with higher academic achievement. The authors related this to the nature of the curriculum and assessments because exploration of learning materials beyond the course work was not rewarded. Also, Newble and Hejka (1991) found a poor correlation between deep approaches to learning and superior academic performance amongst medical students. The authors felt that an overloaded curriculum and assessment methods that require remembering large amounts of factual information were encouraging and rewarding students who adopted strategic or surface approaches to their learning.

In more recent times, a study by Ward (2011a) showed that medical students who took a strategic approach to their studies were more likely to perform highly in terms of their collective grades at the end of their first and second years and performance on a medical licensing

examination. Deep approaches were associated with adequate performance and surface approaches with inadequate performance on the same outcomes. In another study by Ward (2011b) it was reported that mean grades of first year medical students on a gross anatomy course who took a strategic approach were significantly higher than those who took a surface approach to their learning. Mansouri et al. (2006) reported that Nursing and Midwifery students who adopted a deep or strategic approach to learning exhibited higher grade point averages compared to students who adopted a surface approach. Ryan et al. (2004) reported that grades were associated positively with both the deep and strategic approaches but negatively with surface approaches for veterinary medicine students in their pre-clinical years.

THE VIEWS OF EDUCATIONAL RESEARCHERS

Haggis (2003) provides several criticisms of the widely accepted approaches to learning theories that have greatly influenced higher education policy, funding priorities and curriculum. Haggis feels that there is a lack of critique of the approaches to learning theories and their extensive use in higher education. She describes the theories as being an over generalisation and too narrow to fully encompass the complexity of learning practices and the diversity of student circumstances in higher education. A major criticism that Haggis makes is that the approaches to learning theories may not reflect the goals and aims of many students but reflect the class based values of academics. She is concerned that students may not be able to engage with their learning material in the way that higher education institutions would like because they do not understand the aims as conveyed through teaching and assessment or because they are coming from a different cultural perspective or are juggling work or parental responsibilities.

In response to Haggis's critique, Marshall and Case (2005) state that the academic goals associated with a deep approach such as intellectual curiosity and personal and meaningful relation with a subject are essential to higher education and while some student's may find them hard to attain they should certainly be strived for.

RECOMMENDATIONS FOR BEST PRACTICE

The research literature supports the theory that deep approaches to learning leads to a deep understanding of academic material (Marton and Saljo, 1976a; Marton and Saljo 1976b; Biggs 1979; Watkins 1983). Based on this evidence, higher education should be aiming to encourage academic practices that are in line with the deep approach to learning. Higher education courses are preparing many students for the work place, that is, training them for vocations associated with their chosen subject. A student who has completed a Bachelor of Science degree, for example, may work as a research scientist. The work of a research scientist requires a deep understanding of their topic of research to enable identification of gaps in the literature, critical thinking about contradictory findings, experimental design, analyses of results, problem solving and reflection on practices. Students should therefore be equipped with the skills associated with a deep approach to learning to enable them to be successful in their chosen profession. This view is supported by the work of Newble et al. (1990) which showed that specialist physicians take a deep approach to their learning. Haggis (2003) suggests that the deep approach simply reflects the values of academics; however, it should be considered that the deep approach is a requirement of many professions and should therefore be valued and strived for in higher education.

In relation to exam performance, the findings described above suggest that taking a strategic approach to learning, as opposed to a deep or surface approach, is associated with higher exam success. This may not be the optimal scenario for higher education institutions as while students who take the strategic approach perform well on exams, parts of their understanding may be deficient. The research findings on the relationship between deep and surface approaches to learning and exam success are controversial and this is likely to be related to differences in curriculum and assessment methods across disciplines and universities.

Understanding is a complex phenomenon that has been described as being internal and not fully observable; through assessment lecturers are able to gather evidence that a student probably understands (Potter and Kustra, 2012; Entwistle and Nisbet, 2013). If higher institutions aspire to deep understanding and the academic qualities associated with the deep approach then they should aim to encourage and reward such qualities in their curriculum, teaching methods and assessments. Studies have shown that problem based learning; research projects, reflective learning, essay writing and the creation of learning outcomes and aligned assessments are associated positively with a deep approach and deep understanding whilst lecture based learning, heavy workloads, objective tests and assessments that require the recall of large amounts of factual information promote the more undesirable surface approaches to learning (Newble and Hejka, 1991; Scouller, 1998; Leung and Kember, 2003; Ryan et al., 2004; Craddock and Mathias, 2009; Ward, 2011b; Potter and Kustra, 2012; Grant et al., 2012).

Problem based learning (PBL) is a teaching method that is used by many medical schools around the world today. As opposed to lecture based learning (LBL) where the aim is to deliver knowledge to the learner, the aim of PBL is to stimulate cognitive activities, self-directed learning, problem solving skills, collaboration and deep

understanding (Dolmans et al., 2005). In PBL, students, in small groups, are given problems which serve to stimulate the learning process; discussion, explanations, note taking and asking questions are all encouraged. Tutors serve to facilitate the learning process by promoting deep discussion, interaction amongst students, clarification and by ensuring that all students are involved. For PBL to be effective it is recommended that problems are challenging, complex and ill structured. Ideally, tutors should be neither too dominant nor too passive and be equipped with the skills to deal with problems that arise due to difficulties in group dynamics (Hmelo-Silver, 2004; Hendry et al., 2003; Dolmans et al., 2001). Whilst PBL has been shown to promote deep and self-directed learning, as well as student and lecturer satisfaction, the ability of PBL to induce improved knowledge in comparison to LBL is controversial (Blumberg and Michael, 1992; Schmidt and van der Molen, 2001; Colliver, 2000; Dochy et al., 2003; Beers, 2005; Nandi et al., 2000; Meo, 2013). It may be that a combination of both PBL and LBL will be the optimal strategy for teaching in higher education.

Inquiry based learning (IBL) is another teaching approach that has been widely encouraged within the life sciences but is also applicable to other subject areas (Smith et al., 2013). IBL is believed to promote problem solving skills, peer discussion, active learning, critical thinking, innovation and deep understanding. In IBL lecturers may encourage students to take on the role of a scientific researcher, actively solving research based problems or explaining research findings with their peers as collaborators. This approach is contrasted with LBL where students take a more passive role in their learning by mainly listening to the lecturer's presentation. We believe, however, that whilst IBL should be encouraged it should not undermine the student's developmental understanding of scientific concepts, theories and explanations which can often be achieved through more traditional lecture based teaching methods.

Reflective learning is another learning strategy that encourages critical thinking, deep understanding and improved future performance. In reflective learning students reflect upon their learning experiences by writing them down, analysing them critically from different perspectives and relating theory to practice. In medical education, for example, this may take the form of the creation of reflective portfolio's or journals following clinical training. Research has shown that the use of reflective portfolios in medical education improves knowledge and understanding (Buckley et al., 2009). A possible drawback of this type of learning is that it is time consuming and may distract from other forms of clinical learning. Reflective learning has also been used successfully in the life sciences to enhance student knowledge and understanding and improve team working skills (Mayne, 2012).

Traditionally, a teaching qualification is not a requirement for a lecturing post in higher education; however, at universities in the United Kingdom (UK), a teaching qualification has become more and more desirable. Many new lecturers appointed to lecturing posts in the UK are now required to undertake study for a postgraduate diploma or certificate in higher education. This may be an approach that universities in sub-Saharan Africa may wish to adopt, where lecturers are required to obtain a teaching qualification or undergo some form of professional development training in higher education in order to promote best practice.

Simpler strategies for promoting deep learning may include creating a course brochure containing information on curriculum, timetable, submission dates for essays/ research project reports, required referencing style and information on plagiarism. Such a brochure, given to students at the start of each academic year, will help students to organise their study time more effectively and enable deep learning. Utilisation of plagiarism checkers such as Turnitin to ensure original work and ideas is also likely to ensure deep learning.

In modern times, the internet has afforded many new educational tools such as blackboard, podcasting and Web 2.0. Web 2.0, for example, allows students and lecturers to create user generated content in a virtual community. Brown (2012) reported that academics in higher education had mixed views about the usefulness of Web 2.0 in their teaching. Whilst some academics felt it enhanced knowledge exchange, reflection and criticality others suggested that proper research studies were required to demonstrate its pedagogical benefits and effectiveness in improving understanding of a subject. Online interactive educational materials have been shown to reinforce information provided in lectures and e-learning systems such as PeerWise that allow students to author their own multiple choice questions and associated explanations, are associated with a deeper understanding of educational material (Thompson et al., 2011; Bates et al, 2011). It is recommended that online learning discussions remain focused on subject matter and online materials be well-structured to encourage deep learning (Chacon, 2005). Research should continue towards the development of design strategies for online courses that promote deep learning (Ke and Xie, 2009).

Infrastructural problems in some countries, underfunded higher education systems and institutional cultures may induce teaching practices that do not encourage deep approaches to learning. It is also important to consider that school leavers and mature students starting higher education for the first time may not initially have the meta-cognitive skills and learning strategies to engage with the learning material in a deep way; teaching strategies that promote a deep approach to learning may have to be introduced gradually into the curriculum and some students may benefit from study skills counselling (Watkins and Hattie, 1981; Haggis, 2003). Organisational self-learning strategies such as

selecting the main ideas from the text and sketching a map of the most important ideas are associated with a deeper understanding of educational material (Pintrich, 1999).

One must consider however that other external factors beyond the context of the learning such as motivation or personal circumstances e.g. financial penury may influence the learning approach adopted and that changing the learning approach of a student may not be straightforward as demonstrated in the work of Marton and Saljo (1976b). Studies have shown that factors such as age, ethnicity, parental involvement and the learning environment can influence the approach a student takes to their learning (Chacon, 2005; Kek et al., 2007). As the number of private universities continues to increase in sub-Saharan Africa it is important that these new universities address the total learning environment of its students. Future research could examine the correlation between learning approaches and learning outcomes in different types of higher education institutions for example public, private and open universities.

Other factors, such as, IQ, personality, socioeconomic status/social factors, disorganised study habits and learning pathologies are likely to influence educational outcomes in higher education to varying degrees (Watkins and Hattie, 1981; Newble and Hejka, 1991; Walpole, 2003; Matthews et al., 2005; Deary and Johnson, 2010).

CONCLUSION

The evidence described above suggests that approaches to learning do impact upon educational outcomes and the approaches to learning concepts should therefore be influential in higher education teaching and practice in sub-Saharan Africa and by extension universities worldwide, however higher education institutions should also consider the multi-factorial nature of learning and the diversity of its students. Critiques of the approaches to learning theories should be welcomed and research should continue, in particular, to identify optimal ways of promoting deep approaches to learning in higher education and to understand their relevance in different cultural contexts.

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