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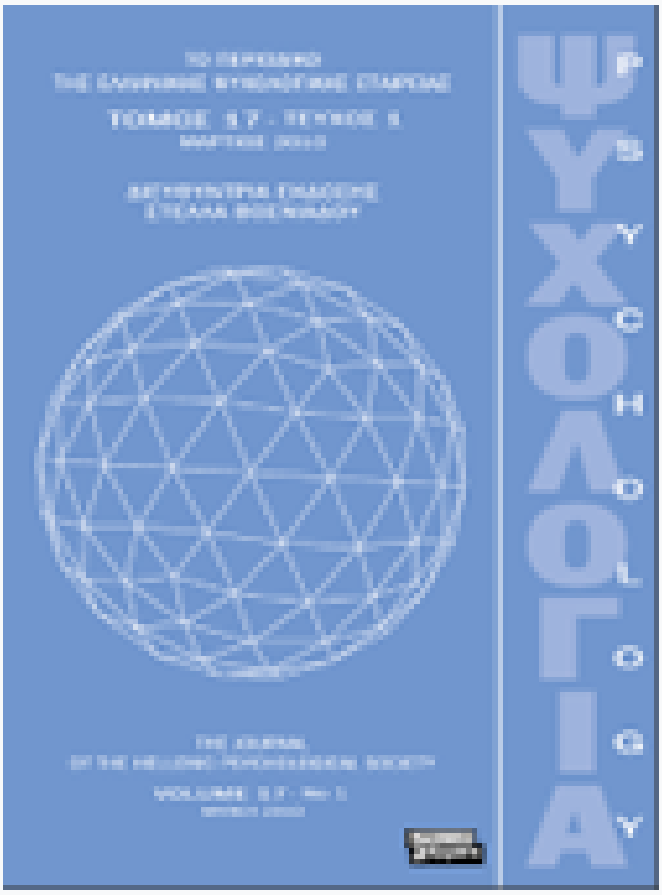

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Research into student understanding within university courses: A commentary on the last three papers

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1. Introduction

This commentary looks at the last three articles on the special issue, those by Velda McCune, Evangelia Karagiannopoulou and Sue Hallam and Hazel Francis. The first two papers focus on exploring students' understanding. Velda McCune explores learner identities and the will to understand of undergraduate bioscience students. Evagelia Karagiannopoulou analyses the effect of in-class experiences and the nature of examinations on understanding of final-year psychology students. The third paper by Sue Hallam and Hazel Francis deals indirectly with understanding and focuses on analysing students' conceptions of the nature of argument. Skills of argumentation are a crucial part of critical thinking skills which, in turn, have been shown to be related to the deep approach to learning.

2. Research on student learning in higher education

In spite of the growing body of research on student learning in higher education, there still are many unanswered questions. In fact, it seems that the more empirical evidence there is, the more new research questions arise. So far, there is a general agreement on the existence of qualitative differences in students' intentions in learning as well as in the processes and strategies they apply when studying (e.g., Biggs, 1979; Entwistle & Entwistle, 1992; Entwistle & Ramsden, 1983; Marton & Säljö, 1976; 1997). Moreover, there is evidence that students' approaches to learning are context dependent and that there is an interaction between approaches to learning and students' experiences of their teaching-learning environments (e.g., Entwistle, Tait, & McCune, 2000; Kreber, 2003; Lawless & Richardson, 2002; McCune, 2004; Parpala et al., 2010; Richardson, 2005; Richardson & Price, 2003; Sadlo & Richardson, 2003). In addition, research indicates that approaches to learning have an effect on the learning outcomes so that the deep approach to learning seems to be related to higher-quality learning outcomes than the surface approach (e.g., Entwistle & Ramsden, 1983; Lindblom-Ylänne & Lonka, 1999; Nieminen, Lindblom-Ylänne, & Lonka 2004). This is especially true, when we look at general or, on average, study success. In the case of individual courses, assessment methods and assessment criteria play an important role in determining study success of students.

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However, many issues still remain unclear. For example, there is not enough evidence on *the specific ways* the students' intentions and actions during the learning process enhance or impede their understanding of the subject matter or how the teaching-learning environment affects student learning. Understanding and skills of argumentation are crucial elements in studying and necessary for successful studying in higher education. The three papers add to our understanding of factors affecting student understanding.

3. Methodological challenges in research on student learning

Research on student learning takes mostly place in natural study settings that pose challenges to the methodological solutions. In particular, when exploring such an abstract phenomenon as understanding, specific attention has to be paid to the selection of research methods. For example, direct questions of students' conceptions of the nature of understanding or the processes they use to reach understanding can bias the results, because such questions presume an aim to understand. A similar problem is faced when inventories are used: studies on student learning systematically report higher average scores on the deep approach than on the surface approach, because items measuring the deep approach describe highly valued intentions and processes. Students seem to have a greater tendency to agree with these items than with items measuring the surface approach. In addition, the abstract nature of the phenomenon makes it difficult for the students to describe their conceptions of understanding or ways to reach understanding, especially for students who do not study behavioural sciences, such as psychology or education. I have personally observed clear disciplinary variation in students' awareness, and even skills, in describing their learning and studying in interviews.

The authors of the three papers have resolved the methodological challenges in different ways. Velda McCune carried out semi-structured group interviews, whereas Evangelia Karagiannopoulou used semi-structured individual interviews. Sue Hallam and Hazel Francis explored students' conceptions of argument by using qualitative methods within a quasi-experimental design.

The paper by Velda McCune focuses on analysing aspects students themselves experienced as enhancing their will to understand. McCune had chosen to use semi-structured group interviews of final year undergraduate biosciences students studying in three one-semester long modules in three different universities. The group interviews did not focus directly on students' will to understand, but instead, on their plans for the future, their experiences of the teaching-learning environment, how they felt they had learned to think or act like a bioscientist and on the impact of the module on their enthusiasm for the subject. Thus, the themes of the interviews "circulated around" understanding and the will to understand, but these were not directly asked. This, I think, was a wise decision especially because the study concerned biosciences students. The numerous interview extracts of McCune's paper show very nicely how students' understanding develops and how integration into a research community and work placements can enhance students' will to understand.

The paper by Evangelia Karagiannopoulou explores the effect of classroom learning experiences and types of assessment on students' learning through individual interviews. The aim was to identify possible differences in the approach to learning used by students taking different types of examination. While the interviews allowed that classification to be made, and despite the interactive form of interviewing, only a few students were able to describe in detail their cognitive activities and learning experiences. This happened even though the method was carefully designed and the participants were psychology students who, in my experience, should be more aware of their intentions in studying and their study strategies than, for example, science students. This shows how difficult it is to capture what actually happens when students study, how students gain understanding, and how understanding develops during university studies.

The methodological design of the Hallam and Francis paper is excellent and provides the readers with rich data. The paper consists of two studies. The data for the first study were collected by using individual semi-structured interviews concentrating on students' conceptions of the nature of argument. The data for the second study were collected by using a quasi experimental design: by dividing the students into two groups and varying the order of tasks given to the students. This research design revealed great variation in students' conceptions of argument. At the same time the paper by Sue Hallam and Hazel Francis importantly showed how much the methodological solutions affect the results. Without this quasi experimental design the richness of the results would have been missing. Well-designed multi-method approaches, such as the one in this study, can take research on student learning into a new level.

4. The effect of in-class experiences and the nature of examination on student learning

In her paper, Evangelia Karagiannopoulou found little evidence that the type of examination affected the approach to learning, contrary to what is often argued to be one of the advantages of changing from closed- to open-book exams. In this study students with a deep approach kept that approach even when faced with closed-book exams, which is in keeping with previous research that has indicated that students with this approach may not be as sensitive to the assessment practices and demands as students who apply the surface or strategic approaches to learning. My own studies (Lindblom-Ylänne & Lonka, 1999, 2001) show that advanced medical students who applied the deep approach to learning seemed to be immune of the effect of assessment practices on their own approaches and practices: they continued in studying for examinations in the way they thought suited them the best. Thus, they did not adapt their study practices according to the assessment forms used even though one advantage of open-book exams has often been suggested to be encouraging personal understanding. Of course, both the open-book and closed-book examinations used in Karagiannopoulou's study contained essay-type questions and might have been perceived as making similar demands on students, unlike the previous research that has shown marked differences between essay examinations and multiple-choice tests.

5. Important practical implications

The results of Velda McCune's paper showed the crucial role of authentic learning experiences on enhancing understanding and identification with their future roles as scientists. The results further show how important it was for the students that they were given personal responsibility for meaningful tasks. Thus, real-world tasks seemed to enhance the development of their identities as scientists. There are many important implications for practice. More emphasis has to be paid on the nature of the learning tasks and to the active role of the students. Students need challenges and more opportunities to engage with experts of their own fields in real-life work environments.

The study by Evangelia Karagiannopoulou showed the effect on students' attitudes to learning of by a mismatch between the declared aims of open-book exams (to foster student independence of thought) and the requirements perceived by students to have been made by some of the tutors choosing open-book exams to conform to the tutor's own understanding in those exams. This seems to be an important warning to university teachers about "practising what they preach": if open-book exams are used, students must be given the freedom to develop their own independent understandings and judged on that basis.

The Hallam and Francis paper highlighted the importance for teachers to be aware of the variation in students' conceptions of argumentation (as well as the conceptions of learning and knowledge). A teacher's own conceptions can be very different from those of his or her students and this has to be taken into account when planning teaching. Teachers' approaches to teaching (i.e., how they teach) and the conceptions they hold about teaching (i.e.,

what they believe about teaching) have been the focus of several studies in recent years. Studies on approaches to teaching have identified two broad categories, the student-centred and the teacher-centred approaches to teaching. The student-centred approach is described as a way of teaching which sees teaching as facilitating the students' learning processes. The teacher-centred approach is described as a way of teaching in which students are considered to be more or less the passive recipients of information transmitted from the teachers to the students (e.g., Kember & Kwan, 2000; Trigwell & Prosser, 1996a, 1996b). Thus, a student-centred teacher takes students' conceptions and understanding as the starting point in teaching, whereas a teacher-centred teacher concentrates more on the content itself without questioning the previous knowledge and conceptions of students.

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