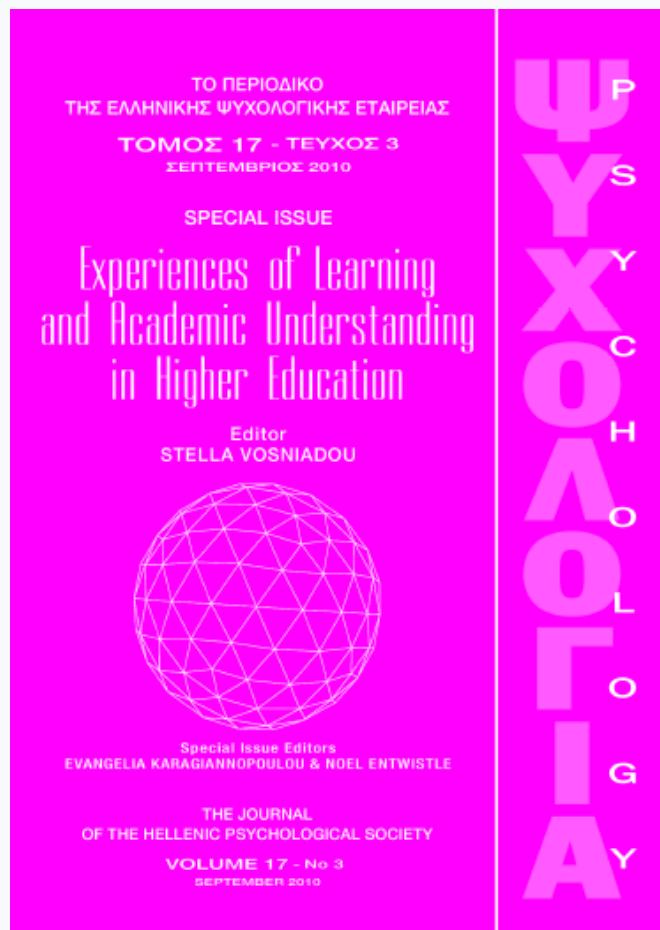


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Striving for a thorough understanding of the discipline: A commentary on the first four papers

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1. Introduction

This commentary looks at the first four articles, those by Hazel Francis, David Hay, Max Scheja and Anna Bonnevier, and Lennart Svensson. Each of these four papers examines the processes by which students come to understand, or fail to understand, ideas within academic disciplines. It concentrates on those ideas introduced in the four papers that contribute most strongly to the main theme of this Special Issue in clarifying the nature of the learning processes through which students strive to reach a thorough understanding. Although the theoretical frameworks used in the analyses are quite different, the conclusions reached nevertheless seem to offer complementary views of how students come to understand. In this commentary, certain aspects from each of the articles are highlighted, leading to a more general discussion to consider how these papers extend the research on student understanding.

2. A brief historical background

The ideas of Gordon Pask and Ference Marton, which both figured in a paper symposium of the *British Journal of Educational Psychology* in

1976, form a historical background against which to consider how these four articles develop the research area on student understanding. Pask (1976) was mainly concerned with how computers might be used to provide tutorial support for students through intelligent tutoring, but it led him to explore the fundamental requirements for developing understanding. He focused on the ways in which elements of knowledge interlinked within "entailment structures" and how students came to recognize these interconnections. But he was also interested in what was required for the most effective learning to take place. He decided that it depended essentially on the quality of the conversations that take place between a well-informed tutor and an individual student, through which understandings can be mutually explored. The tutor leads the student towards understanding through a Socratic dialogue and also provides immediate feedback on the adequacy of the student's current understanding. In practice, and increasingly in mass higher education, this ideal has long gone, but it can be mimicked in various ways, through tutorial discussions or e-learning provision. Pask also drew attention to the fact that such learning depended on the quality of the ongoing internal conversations through which students developed

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their emerging understandings, and also on the quality of feedback provided to help students refine their understanding.

Marton, with his research group in Gothenburg, broke with existing psychological conventions about research into learning by using interviews with students that moved progressively deeper into their experiences of reading and explaining an academic article, until they had covered their intentions, their learning processes, and their levels of understanding (Marton & Säljö, 1976). The research team also broke with tradition by focusing on the learning and understanding of specific academic subject matter within the context of everyday university study. As a result, they identified different "levels of processing" in students' learning that depended on their intentions (to reproduce or to understand) and that corresponded closely with categories describing qualitatively different understandings. Lennart Svensson (1977) subsequently reported an alternative way of describing these differences in terms of how students focused on parts and wholes within the content, leading to the distinction between *holistic* and *atomistic* cognitive approaches. Out of these two conceptualisations emerged the notion of deep and surface *approaches to learning* which, importantly, were "relational" in the sense that the approach adopted depended on both the content and the context within which the learning took place. In subsequent work the research approach was developed into phenomenography which, both in interviewing strategies and in techniques of qualitative analysis, has had a profound influence on subsequent thinking about student learning (Entwistle, 2009).

3. Conversation theory and language learning

Hazel Francis uses Pask's conversation theory to explore the reasons why some students fail to understand what other students have grasped quite readily, and to suggest what might be done to overcome such difficulties. She draws on his ideas about the "architecture of a learning

conversation" between tutor and student to show how tutors can help students recognize the meaning, not just of important ideas within the discipline, but also the purpose of the learning processes that enable that meaning to be grasped. Her earlier work on young children learning to read had convinced her that a crucial reason for difficulties in reading, or learning generally, came from a lack of understanding of what was going on within learning situations. That failure could often be tracked down to a cultural background that did not provide the necessary explanations about what reading involved, but the failure to understand the purpose of a learning activity has equally negative effects on student learning at university.

Pask had also stressed the importance of the implicit contract that was needed within a learning conversation. In her article, Francis draws attention to what that implies for the student and the tutor. The student has to accept "a commitment to learning through actions on words and deeds – a thrust towards understanding", whereas students often see learning as involving no more than the ability to reproduce ideas that have been provided in lectures or tutorials. The tutor, in turn, has to make sure, not only that the student has grasped the meaning of a topic, but is also able to use that understanding effectively in novel situations. The tutor has to ensure that students apply "firmly-based effort" to make the understandings they reach their own, and to recognize that those understandings are intended to be translated into action.

Francis argues persuasively that words and actions have to act in consort if understanding is to be within reach. "Learning requires relating these ways of acting to a language that can function adequately to communicate about them – new experience to new expression, new deeds to new words... Somewhere along the line verbal expression has to touch ground with physical and social reality." Students have to acquire the language of the discipline in order to reach and convey an academic understanding, and in recent research on graduate students initial misunderstanding was common as they met an unfamiliar discourse

that they were forced to interpret through an earlier inappropriate one.

4. Dialogic interaction

The starting point of the series of studies by David Hay and his colleagues in London was an exploration of the use of concept mapping both to encourage students to develop their understanding and to indicate the extent of academic understanding reached. Initially they were drawing on the conventional form of concept mapping developed by Novak and based on Ausubel's ideas about the nature of concepts and their interrelationships. The technique was tried out across several contrasting subject areas suggesting that the method had considerable constraints created by clear-cut rules for their use. Relaxing these rules allowed students and staff more flexibility in exploring appropriate ways of using them across these subject areas. And, considering why this more flexible form was necessary, led to theoretical explorations of the nature of dialogue in learning at university. While the main inspiration for this thinking came from the semiotic theory of Bakhtin, its conclusions overlap with those reached by Pask in his conversation theory.

In his article, David Hay describes this background in more detail before presenting in-depth analyses based on the reflections of two students who agreed to explain how their learning was affected by their adaptation of free-form concept mapping to their own ways of working as they tried to make sense of complex academic subject matter. Within these reflections, one of the students described the effects of feedback from a tutor that had fundamentally affected his approach to studying, as he realised that he had, previously, been satisfied with no more than a superficial understanding of the topic. The other student used the concept maps to test her emerging grasp of the whole subject area as she read widely and thought deeply about it. It seemed that both students began to use their imagination in drawing their understanding closer to the substance of the physical reality the

interplay between concepts was seeking to describe. And in so doing they were coming closer to the essence of the subject, and developing a real feeling for it.

From these two in-depth case studies, along with a series of on-going studies, David Hay is developing a different way of thinking about academic understanding, one which offers dialogic concept-mapping as a tool for encouraging students to become more conscious of their developing personal understanding, but also providing a theoretical underpinning that shows how students make use of other areas of knowledge, their previous experiences, and the dialogue they have with tutors and with other students, to build up a personal understanding that also accords with disciplinary constraints. He argues that "One compelling aspect of semiotics is to acknowledge that the 'languages' of disciplinary representation are so inter-twined that a 'way of saying' and an 'object of inquiry' are inseparable".

5. Contextual analysis

In their study into medical students' understanding, Max Scheja and Anna Bonnevier draw on the theoretical framework developed by Ola Halldén and his colleagues in Stockholm (Halldén, Scheja & Haglund, 2008). That framework emerges from research into young children's conceptual development and adolescents' ways of learning school work, which recognizes that people can, at the same time, hold alternative conceptions of the same idea which are linked to different contexts and which are evoked by similar contexts. The research findings also stress the importance of the different levels of conceptualisation that people have when learning, involving both the content itself and the social and academic context within which the learning takes place. And it is this latter contextualisation that comes out most clearly in the paper by Scheja and Bonnevier.

In semi-structured interviewing, medical students explained the difficulties they had initially experienced in facing an overwhelming diet of factual information but, once embarked on the

clinical phase of their degree programme, they increasingly recognized how the parts related to the whole, how the clinical information allowed them to make sense of symptoms presented by patients. The students seemed to be thinking increasingly about the nature of understanding within the medical curriculum and the importance of "seeing the big picture". In the analysis, the researchers were able to demonstrate within medical education "how students develop personal understandings of learning tasks and concepts by putting them in a particular interpretive context or framework where they make sense for the learners in the perceived circumstances". They also concluded that the students were developing more fundamental conceptualisations of the nature of medicine, not through specific concepts, but through grouping facts and concepts together to form what medical experts have described as "illness scripts" that can more readily applied to the circumstances of a clinical case. The interviews did not reveal such scripts, but the linking of parts to wholes, which was repeatedly mentioned, suggested a movement in that direction.

6. Contextual phenomenography

Phenomenographic research has concentrated on identifying the differing conceptions that students are found to hold of specific concepts (Marton & Booth, 1997), but this concentration on content led to a lack of concern for the context within which the learning is taking place. For this reason, Lennart Svensson and his research group in Lund have been developing a variant of phenomenography, using a similar interview methodology, but keeping both content and context firmly in focus. They have also deepened the examination of the context to include not just the learning environment, but also the personal context within which students try to make sense of academic topics. In his article, Svensson uses three case studies to explore both the cognitive approaches students have been using (holistic or atomistic) and also the personal context and how it affects the way students

explain their understanding. In each case, he is able to demonstrate that these students were, at times, using their own language and experience in attempting to make sense of an academic topic or phenomenon for themselves. In so doing, they were adopting an idiosyncratic terminology, running to some extent counter to the technical concepts expected by the tutors.

From this study, Svensson concludes that "the importance of the agency of the learner, and the approach characteristic involved in the use of language, implies that the flexibility and variation in the approach and use of language has to be considered, especially in an educational context aiming at new personal understandings". In more general terms, he argues that we must treat seriously the implications of this aspect of personal understanding, by recognising the different forms of contextualisation that affect learning.

7. Learning processes involved in reaching understanding

The extensive review of the literature on research into student understanding provided by Scheja and Bonnevier in this issue has already indicated additional conceptualisations beyond those used in the articles in this group. They trace the development of research into understanding through the description of different "forms of understanding", as students prepared for finals examinations, to the experiences of "knowledge objects" (Entwistle & Marton, 1994; Entwistle & Entwistle, 2003) where students had adopted active deep approaches in developing their understanding into tightly structured entities that they could "almost see". That provides part of the picture of how students develop understanding, but this description is essentially rooted in a cognitive perspective. Even though it still describes students' own experiences of understanding, it focuses mainly on the end-point of understanding, whereas here we are looking at the processes that lead up to understanding, and that has brought us closer to recognizing the individuality of those seeking that understanding.

The articles all bring in additional elements.

Francis and Hay both stress the importance of dialogue and tutorial support in leading towards understanding, as well as pointing up the necessary connection between language and conceptions. Most of the earlier literature on conceptual change has focused on how students can be led towards disciplinarily acceptable understandings, whereas the personal understandings students reach will almost always be rather less than that. Svensson demonstrates a feature that has also been missing in earlier research, namely students using their own terminology as they try to understand phenomena, and in so doing throw light on the way they make sense of those events. Of course, these “home spun” explanations are unlikely to have the power or accuracy of the academic ones, but they may well represent one way in which students move towards the accepted conceptualisations.

The three students in Svensson’s analysis were all adopting a deep approach but, as he points out, that does not mean that they are also being holistic in looking at relationships between the parts and the whole. Scheja and Bonnevier track the changes taking place as medical students recognize the importance of linking the parts to the whole, with the previously rote learned information building up into integrative “scripts” that guide clinical reasoning. In Hay’s study, one of the students starts with a surface approach, which changes radically once he recognizes, in his concept map, a serious lack of personal understanding of the topic. Thereafter, his approach is deep and his interest in the substance of the subject is engaged. The other student already had a thoroughly deep approach, suggesting what has recently been described as a *disposition to understand for oneself* (Entwistle & McCune, 2009) with its continuing determination to reach a personal understanding. This student was confident enough to abandon earlier concept maps altogether to avoid her understanding being constrained by her previous structures. This is similar to the medical students whose understanding is “moving” (Fyrenius, Wirrell, & Silén, 2007), being never fully satisfied with their existing understanding and always looking for ways of improving it.

All of the articles have brought out issues to

do with “contextualisation” that go beyond the initial concern with content and context by recognising the importance of students’ conceptions of not just the reason for the task they are tackling, but also their awareness of the nature of knowledge and discourse within the discipline they are studying. Three of the articles show how students engage with specific academic topics or courses, bringing out the crucial importance of seeing the distinctiveness of different disciplines and the need for teaching and learning activities to take account of what has been described as *the inner logic of the subject and its pedagogy* (Entwistle, 2009).

Finally, what do these articles have to say about the implications for university education? Francis and Hay both stress the crucial role of tutorial support and how feedback helps to shape understanding of both the topic and the academic discourse. And yet the provision of this type of support has been one of the main casualties of the reduced teaching resources made available, and is now even more severely threatened by further financial cutbacks. Hay also shows how a much more open form of dialogic concept-mapping can both encourage the development of personal understanding and show what stage has been reached. Scheja and Bonnevier suggest, as does Francis, that students need to be shown the whole picture much earlier than is often currently the case, while both Svensson and Hay want university teachers to become more aware of the important personal characteristics within students’ understanding that need to be appreciated, even cherished.

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