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University students' self- and co-regulation of learning and processes of understanding: A person-oriented approach

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ABSTRACT

The study used a person-oriented approach to identify different profiles relating to the self- and co-regulation of learning as well as university students' processes of understanding. Altogether 33 participating university students were interviewed. The data were analysed using qualitative inductive and deductive content analysis. Three student profiles were identified: 1) self-regulated students not using co-regulation, 2) actively co-regulating students with average self-regulation skills, and 3) students with self-regulation problems relying on co-regulation. Self-regulated students not using co-regulation showed evidence of excellent self-regulation skills and deep-level processing, whereas actively co-regulating students with average self-regulation skills showed an active use of co-regulation of learning, some problems in self-regulation, and challenges in deep processing. Students with self-regulation problems relying on co-regulation emphasised other students' support when studying, and exhibited surface-level processing. The results imply that by recognising the profiles of university students it is possible to identify those who may be at risk and in need of more support in their studying.

1. Introduction

The regulation of learning and deep processing of understanding are essential in effective university studying. A rich body of research has addressed the self-regulation of learning in the university context in order to add to the knowledge of learning. Recent years have also seen increasing interest in the co-regulation – i.e., social regulation – of learning. However, little is known about the co-regulation of learning in the university context – although it is more important than ever due to the increase in collaborative learning practices in university education and the emphasis on group-work skills. These skills are also important in working life after graduation, because experts need to continue learning as part of their everyday work as well as be able to reflect on their learning and performance (Brooks & Everett, 2008; Van de Wiel, Van den Bossche, Janssen, & Jossberger, 2011) and work collaboratively. The knowledge base that students acquire while studying expires rapidly, and after graduation students have to keep their knowledge and skills up-to-date (Brooks & Everett, 2008). Preparing regulation skills and deep learning is an important challenge for higher education (Endedijk & Vermunt, 2013; Segers, Nijhuis, & Gijselaers, 2006) because students are expected to move towards self-regulation and deep learning while at university (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2013). Recent years have seen a growing interest in how these skills develop during university education (Coertjens et al., 2013; Donche, Coertjens, & Van Petegem, 2010).

Despite growing agreement on understanding the regulation of learning as both an individual and social process (e.g. Volet, Vauras, & Salonen, 2009), research focusing on both processes as well as individual combinations related to self- and co-regulation along with the processes of understanding is scarce. Therefore, a person-oriented approach was used in the present study. Our major aim was thus to identify profiles related to the self- and co-regulation of learning as well as university students' processes of understanding.

1.1. Self- and co-regulation of learning

Self-regulation of learning refers to students' proactive and intentional action in which students regulate their cognition, behaviour, motivation and emotions in order to enhance their learning processes (Hadwin, Järvelä, & Miller, 2011; Pintrich, 2004; Schunk & Zimmerman, 2012; Zimmerman & Schunk, 2011). Self-regulated learning includes three different phases: 1) goal setting and planning before studying, 2) using different strategies, and monitoring and controlling learning as one studies, and 3) reflecting on learning after studying (Zimmerman, 2000, 2002, 2012). The self-regulation process is cyclical in nature because feedback from prior performance is used for adjusting future performance (Zimmerman, 2000; Pintrich, 2004; Winne & Hadwin, 2012). Moreover, self-regulation is dependent on the context (Pintrich, 2004). Research shows that university students may experience difficulty in regulating learning particularly at the beginning of studies, and may avoid challenging goals and situations when studying (Heikkilä, Lonka, Nieminen, & Niemivirta, 2012). Because of the cyclical nature of the self-regulation process, supportive motivational beliefs, such as self-efficacy beliefs,

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have an important role in engaging in self-regulation (Pajares, 2012; Schunk & Usher, 2011; Wolters, Benzon, & Arroyo-Giner, 2011; Zimmerman & Martinez-Pons, 1990; Zimmerman & Schunk, 2011, 2012). Self-efficacy refers to one's perceived capabilities for learning (Bandura, 1997).

Co-regulation of learning refers to social regulation of learning in which learners temporarily regulate their cognition, behaviour, motivation and emotions together with other students or a teacher (Hadwin et al., 2011; Järvelä & Järvenoja, 2011; Järvenoja & Järvelä, 2009). In co-regulation, the regulation of learning is shared between oneself and others (Hadwin & Oshige, 2011; Volet, Summers, & Thurman, 2009). The aim is a transition towards self-regulation (Hadwin et al., 2011). There is evidence that co-regulation may qualitatively vary from a low-level to high-level type. Lower level co-regulation refers to a simple exchange or sharing of facts (Volet, Summers, et al., 2009), or using scaffolding in which one person supports the other in developing self-regulation skills (Hadwin et al., 2011). High-level co-regulation refers to using shared regulation in which students collectively share regulation processes that aim to achieve a shared outcome (Hadwin et al., 2011; Volet, Summers, et al., 2009).

Previous research concerning university students' self-regulation of learning shows that self-regulation of learning plays an important role in university students' well-being (Heikkilä, Niemivirta, Nieminen, & Lonka, 2011; Heikkilä et al., 2012). However, research indicates that university students may experience difficulty in regulating learning particularly at the beginning of their studies (Heikkilä et al., 2012). Research also shows that lack of regulation is associated with the non-completion of higher education studies (Vanthournout, Gijbels, Coertjens, Donche, & Van Petegem, 2012). Previous research regarding university students' co-regulation of learning shows that co-regulation of learning can assist students in feeling able to cope and overcome in difficult study situations (Järvenoja & Järvelä, 2009).

1.2. Processes of understanding

The research on the processes of understanding originates from the work of Marton and Säljö in the 1970s, who identified two qualitatively different ways students processed knowledge: deep processing, including students' intention to understand, and surface processing, including students' intention to remember and reproduce knowledge (Marton & Säljö, 1976). Researchers also refer to these qualitatively different ways of processing as 'deep' and 'surface' approaches to learning (Entwistle, 2009; Entwistle & Ramsden, 1983; Marton & Säljö, 1976, 1997; Prosser & Trigwell, 1999), which describe students' intentions in learning and in their study processes (Marton & Säljö, 1984).

Studies show that self-regulation is related to deep processing, whereas external regulation and problems in self-regulation are related to surface processing (Heikkilä & Lonka, 2006; Heikkilä et al., 2011, 2012; Lonka & Lindblom-Ylänne, 1996; Vermunt & van Rijswijk, 1988). Interestingly, research also shows that some students using deep processing may, however, have problems in self-regulation (Parpala, Lindblom-Ylänne, Komulainen, Litmanen, & Hirsto, 2010).

1.3. The present study

Despite the extensive research concerning the self-regulation of learning and processes of understanding, research on the co-regulation of learning in the university context is still scarce. Previous research on the co-regulation of learning has focused on primary and secondary schools, and has shown that co-regulation of learning with peers and a teacher plays an important role in supporting the development of students' metacognition and self-regulation (Grau & Whitebread, 2012; Salonen, Vauras, & Efklides, 2005). Moreover, self- and co-regulation have mostly been explored separately to show how students regulate their learning individually and socially. In order to better understand the regulation of learning, empirical research which takes into account both self- and co-regulation of learning is needed. The present study examines individual combinations of self- and co-regulation of learning as well as the processes of understanding through a qualitative research approach.

2. Method

2.1. Participants

The study participants were 33 university students at a large research-intensive university in Finland. They represented four disciplines, namely bioscience ($n = 9$), educational sciences ($n = 16$), mathematics ($n = 3$) and theology ($n = 5$). The mean age of the participants was 26 years ($SD = 7.40$; Mo = 20; Min/Max = 19–48 years). In terms of age, the sample was well representative of the Finnish student population. The majority of participants were female ($n = 22$) and the minority male ($n = 11$). Most were either first- or second-year students.

2.2. Protocol

Student profiles were explored through semi-structured interviews (Kvale & Brinkman, 2009). The students were asked about their studying and learning experiences at university in general and in a particular course they had just completed. They were not specifically asked about self- and co-regulation of learning. The aim was that they would freely describe the aspects which they considered to be important in their own studying. With the students not being directly asked about their regulation of learning it was possible to recognise how important the regulation of learning was in their studying. The students were encouraged to explain their answers by asking them clarifying and follow-up questions.

2.3. Procedure

In collaboration with the participating faculties, the data were collected from seven compulsory Bachelor-level courses in which the students had participated. The courses are presented in Table 1. The first author went to lectures and told the students about the study. The students were given interview invitations and were asked to submit their contact information if they wished to participate in the study. They were then contacted by e-mail and interviewed after the course. The interviews lasted 40 min on average and were recorded and transcribed verbatim. The procedures followed the guidelines of the national research ethics committee (Academy of Finland, 2003).

2.4. Data analysis

The interview data were qualitatively content analysed (Patton, 2002). The analysis consisted of five phases, as visualised in Fig. 1. In the first phase, interviews were transcribed by the first and second author. Each author read the interviews through several times in order to gain a good comprehensive picture.

The second phase focused on identifying elements of the students' processes of understanding by using inductive content analysis in which the data were analysed without theoretical assumptions (Elo & Kyngäs, 2007). Inductive content analysis was used to analyse how the students described their university studying and learning in general and in a specific course. The analysis involved three steps: data reduction, grouping, and conceptualisation (Flick, 2009; Patton, 2002). First, in the data reduction, all text segments in which students referred to the process of understanding were identified and coded into the same category. Second, the descriptions in this category were coded into two exclusive and qualitatively different categories according to the level of the process of understanding that each student described. Third, these categories were conceptualised as (1) *deep-level processing*, including descriptions in which the students reported relating ideas, integrating new into previous knowledge and evaluating knowledge critically, and (2) *surface-level processing*, including descriptions about