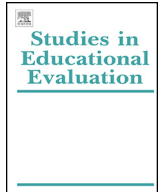




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Students' goal orientations and learning strategies in a powerful learning environment: A case study

Maaïke Koopman^{a,*}, Anouke Bakx^b, Douwe Beijaard^a

^aEindhoven School of Education, Eindhoven University of Technology, Eindhoven, The Netherlands

^bFontys University of Applied Sciences, Eindhoven, The Netherlands

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ABSTRACT

In Dutch secondary education, experiments with powerful social constructivist learning environments are conducted that aim to appeal to students' intrinsic goal orientations, use of deep cognitive learning strategies, and self-direction of meta-cognitive learning strategies. The aim of this study is to gain insight into the relation between learning environment characteristics and students' goal orientations and learning strategies, by means of a case study of one innovative school. Ten lesson observations were carried out. Students ($n = 138$) filled out questionnaires about their learning preferences. Results showed that characteristics of powerful learning environments were present. Students showed relatively strong preferences for mastery goals and had equal preferences for deep and surface cognitive learning strategies. Preferences for self-direction of meta-cognitive strategies were rather low.

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Introduction

This study focuses on the evaluation of an educational programme, with particular attention for the implemented characteristics of the learning environment and the manner in which students learn in this programme. In secondary education experiments with new types of learning environments are being conducted for the last two decades. Many of these learning environments are based on social constructivist views on learning (de Kock, Slegers, & Voeten, 2004; Murphy, 1997), in which learning is considered an active process with learners constructing knowledge while interacting with others (Philips, 1995). Reasons for these experiments often originate from intentions to improve student learning (Simons, van der Linden, & Duffy, 2000). In the study we present here, we investigate one of the experiments taking place in the Netherlands, paying attention to two important aspects: the design characteristics of powerful learning environments, based on social constructivist conceptions of knowledge and learning, and students' learning processes within this learning environment. In this manner, we evaluate whether the school succeeds in implementing social constructivist characteristics in

their learning environment and in eliciting the type of student learning they aim at.

With regard to students' learning processes in powerful learning environments (LEs), three aspects are expected to be relevant. First, the implemented characteristics are often aimed at increasing student engagement and motivation (Deci & Ryan, 2000; Levin, 2000) by making an appeal to students' intrinsic goal orientations underlying their comprehension of learning content (Koopman et al., 2008). Second, it is considered important that students are encouraged to construct their own knowledge in interaction with others (Kanselaar, 2002). When knowledge is constructed by students, deep cognitive learning strategies are carried out, such as structuring the learning content and making mental depictions of learning content (Marton & Säljö, 1976). Third, in powerful LEs an active role of students themselves is needed regarding regulation of their learning (Könings, Brand-Grüwel, & van Merriënboer, 2005). Students are made – partly – responsible for controlling their learning process. In order to do so they need meta-cognitive learning strategies such as orientating, planning, and evaluating (Vermunt & Verloop, 1999). Intrinsic goal orientations, as well as the execution of deep learning strategies, and student-direction of meta-cognitive learning strategies are assumed to have a positive effect on learning outcomes. The relation between LE characteristics and student learning, however, may be complicated by for example strong personal preferences for certain learning strategies students may hold and by the manner in which students interpret the LE they are

* Corresponding author. Tel.: +31402472707.

E-mail addresses: m.koopman@tue.nl, a.bakx@fontys.nl (M. Koopman).

confronted with (Segers, Nijhuis, & Gijsselaers, 2006; van Hout-Wolters, 2009).

Powerful LEs that are based on social constructivist views on learning vary, but often share some basic characteristics (Jonassen, 1994; Murphy, 1997). In order to make learning content more meaningful, the traditional subject areas are integrated. Active student learning, for example by having students conduct research, is frequently visible (Nie & Lau, 2010) and therefore project-based or problem-based education is often chosen as starting point for organizing tasks and learning content (Dochy, Segers, van den Bossche, & Gijbels, 2003; Levin, 2000). Little is known however about the effects of such characteristics in secondary education on student learning, as far as their goal orientations and learning strategies are concerned. Most research concentrates on different, rather isolated, aspects of LEs and its effects, such as effects of problem-based learning (Dochy et al., 2003), and effects of collaborative learning (Hattie, 2009). However, research that integrally investigates the relation between various characteristics of powerful LEs and student learning processes within these environments is needed (Richardson, 2003).

In the Netherlands, the first nationwide initiatives regarding LEs originating from social constructivism were taken in the nineties, but after a lack of success with their implementation only local initiatives remained (Roelofs & Terwel, 1999; Teurlings, van Wolput, & Vermeulen, 2006). Although some of these local practices exist for quite some years now, little evaluation research has been done on the degree to which the schools with such LEs succeed in encouraging effective learning processes. The aim of this study is to gain insight into relation between characteristics of the LE on the one hand and students' goal orientations and learning strategies on the other, by means of a case study of one school in the Netherlands. The school that was selected to participate in the study is considered as one of the schools at the forefront of innovative education in the Netherlands. The central question is: How can students' goal orientations and their preferences for cognitive and meta-cognitive learning strategies be characterized in a LE that is based on a social constructivist view on learning? As such, this research contributes to knowledge about the design of LEs for secondary education that aim to make an appeal to students' intrinsic goals, the execution of deep cognitive learning strategies and self-direction of meta-cognitive learning strategies by students. The results of this evaluation study may further help schools to properly translate the social constructivist theory about learning into classroom practices and teacher guidance that optimally support student learning (Nie & Lau, 2010).

Theoretical framework

Learning environments based on social constructivism

Recent developments in secondary education are often attached to social constructivism. Constructivism can be considered a theory about knowledge development in which learning is assumed to be a process of active construction of knowledge through experience (von Glasersfeld, 1989). The social constructivist version of the theory emphasizes the importance of social interaction (Simons, 2000). Constructivist ideas have had an impact on many educational reforms "that seek to create constructivist-based classroom environments and instructional practices to enhance students' deep understanding of knowledge" (Nie & Lau, 2010, 411). These reforms may take different forms in actual LEs but have some characteristics in common.

First, connections to real-world problems and situations are often the starting point for learning in order to emphasize the relevance and authenticity of learning content (Honebein, 1996; Nie & Lau, 2010). Realistic approaches to solve these real-world

problems are taught (Jonassen, 1994). Second, deep understanding of knowledge and knowledge building is strived for (Bolhuis & Voeten, 2001; Honebein, 1996; Nie & Lau, 2010). This mostly entails a rejection of the knowledge transmission model for education and the acceptance of a student-centred instructional approach. Within this student-centred approach, conceptual interrelatedness is stressed, for example by providing multiple representations of learning content (Jonassen, 1994; Murphy, 1997). Third, communication and interaction between students are emphasized (Honebein, 1996; Nie & Lau, 2010). Such collaborative learning is assumed to reflect outside school learning and is supposed to make students learn from each other. Fourth, student self-regulation of the learning process is ultimately strived for (Bolhuis & Voeten, 2001; Jonassen, 1994), which can prepare students to fulfil societal demands regarding lifelong learning. This needs to be supported by an environment in which tools are provided to students that help them to interpret and understand the learning content (Jonassen, 1994). Teacher guidance in powerful LEs involves coaching students' learning processes (Vermunt & Verloop, 1999), for example by analyzing and diagnosing the strategies used to solve the real-world problems (Jonassen, 1994), challenging the students to think of new strategies, and monitoring and evaluating the strategies used. Also, student learning can be encouraged through active teacher support, such as asking questions, providing assignments, and modelling learning strategies by demonstration (Vermunt & Verloop, 1999).

de Bruijn et al. (2005) created a model in which aspects of (a) the content and organization and (b) the type of guidance in these LEs were integrated. The content dimension can be divided into four components along which schools can differ; these pertain to:

- the actual subject matter and the manner in which it is presented (e.g. authenticity of the subject to be studied, integration of subject areas, tasks which resemble professional practice, a focus on learning-to-learn);
- the structure and range of the subject matter (e.g. the adoption of authentic situations as the starting point for the development of knowledge and practice of skills);
- the starting points regarding the delivery of the subject matter (e.g. use of a mixture of teaching methods, different sources of information, input from students, interaction with students);
- forms of processing the subject matter by students (e.g. active learning, explorative learning, reflective learning).

The guidance dimension concerns: characteristics of the systematic guidance provided by teachers and peers; the guidance, clarification and promotion of the student learning trajectory via a fixed programme framework; the provision of guidance aimed at the learning of skills; and the guidance of learning processes using 10 different forms of guidance (instruction, demonstration, thinking aloud, promoting understanding, allowing autonomous student work, active support, coaching, provision of help when necessary, evaluation, feedback). de Bruijn et al. (2005) assume that a teacher should carry out all 10 of these specific forms of guidance in order to provide complete assistance to students.

Student learning processes

The present study deals with the relation between characteristics of powerful LEs and students' learning processes in terms of their goal orientations and cognitive and meta-cognitive learning strategies.

Goal orientations

Research on achievement motivation has led to an achievement goal framework that integrates affective and cognitive aspects of learning goals (Ames, 1992). These goal orientations reflect the

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