

Learning processes of students in competence based pre-vocational secondary education

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Aims In the Netherlands, around 60% of the children between the age of 12 and 16 attend pre-vocational secondary education (PVSE) schools. Currently, students in Dutch schools for PVSE are increasingly confronted with different forms of competence-based learning environments. The focus of learning in such environments is on the development of competencies in which knowledge, skills and attitudes are integrated. In competence-based learning environments students' goal orientations and their information processing strategies are supposed to play a significant role (Van der Sanden, 2003). Students' goal orientations stem from either intrinsic or extrinsic motivation and reflect the goals they prefer to pursue (Van der Sanden, 2003). In particular, mastery-oriented goals and performance-oriented goals are distinguished with work-avoidance goals (i.e., doing things well but with as little effort as possible) sometimes added in as well (Duda & Nicholls, 1992). Information processing strategies are particular combinations of cognitive learning activities that directly refer to the processing of information to reach learning goals (Vermunt, 1992). Information processing strategies can be classified in two types: deep processing strategies and surface processing strategies (Novak, 2002). Goal orientations and information processing strategies are essential for students to develop the conceptual knowledge that is necessary to become qualified and competent professionals. Little is known, however, about the learning processes and actual knowledge development of PVSE students in general and those in competence-based education in particular. The purpose of this study was to create and validate a model to elaborate on the relation between goal orientations, information processing strategies and development of conceptual knowledge of PVSE students. This model can be used to describe students' learning processes in competence based education. The central question of this study was: what is the relation between goal orientations, information processing strategies and development of conceptual knowledge of students in competence-based pre-vocational secondary education? Method 719 students from 14 different schools that had implemented elements of competence-based education participated in the study. The students were in the first, second or third year of PVSE and they were all involved in a project. Students' preferences for certain types of goal orientations were investigated by means of a questionnaire that consisted of 29 items rated along a five-point Likert scale (Duda & Nicholls, 1992). For each item, the students had to indicate the extent to which they felt satisfied with respect to a specific aspect of the project. Students' preferences for deep or surface information processing strategies were investigated by means of a questionnaire that consisted of 25 items rated along a five-point Likert scale (Vermunt, Bouhuijs, Piccarelli, Kicken, & Andree, 2006). For each item, the students had to indicate to what extent they executed certain processing strategies with respect to the project. The development of student conceptual knowledge was investigated through concept mapping (Novak, 2002). A pretest in which the students had to design a concept map about a core concept was compared to a posttest in which another concept map about the same core concept was made. During the analysis of the concept maps, attention was paid to the elaborateness (i.e., number of concepts, links, layers, and clusters and the relevance of the concepts) and the organization (relative importance of the concepts included, types of connections and the clusters of concepts) of the concept maps. Results A structural model was created in which all significant relations between variables were described. Different significant relations were found between the students' goal orientations and their preference for certain types of information processing strategies. Striving for mastery and performance goals had a positive effect on students' preference for both deep and surface processing strategies. Work avoidance orientations had a negative influence on

students' preferences for both types of information processing strategies. Besides, performance orientations had a positive effect on the quality of the concept maps during the posttest. Concerning information processing strategies, a significant positive relation could be found between students' preferences for surface processing strategies and their preference for deep processing strategies. Possibly, a certain amount of surface processing could thus be a condition for deep processing to occur. Students' preference for surface processing strategies had a significant negative influence on the quality of student conceptual knowledge during the posttest. Surface processing deteriorates the degree to which conceptual knowledge is elaborated and organized well. Theoretical and educational significance This study contributes to the knowledge about learning processes of students in competence-based PVSE. As the implementation of this type of education is still progressing, some considerations could be taken into account when designing learning environments. Especially the encouragement of mastery and performance goal orientations seemed to be a strategy of schools to improve student learning. Our research shows that schools appear to succeed in this.

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