Interactions of study orientation and students' appreciation of structure in their educational environment

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Abstract. Instructional systems differ in the amount of structure they impose on the 'educational environment' in which learning activities take place, e.g., mastery learning implies highly structured learning, whereas problem-based learning (PBL) claims its effectiveness just because of its 'freedom in learning'. Yet there seems to be a lot of structure in the educational system in which PBL is embedded. In this study dimensions of structure were explored in a curriculum based on PBL. Factor analysis on student judgments unfolded three forms of structure concerning different aspects of the educational environment: content, organization, and social setting.

When looking for interactions between structure and student characteristics, e.g., in research on the effectiveness of PBL, it could be important to take this distinction in structure dimensions into account. In general, ATI-research suggests interaction effects for structure. The study that is presented here explored interactions between study orientation and students' appreciation of the three structure dimensions, revealing a rather consistent pattern of differences in appreciation tendencies influenced by the orientation of the student: meaning, dependence, minimalistic, or strategic.

Introduction

A core aspect in describing a learning task, a curriculum, or, more generally, an educational environment is its structure. Structure is assumed to be an important factor in the effectiveness of instruction and learning, and the success of some kinds of instructional programming, e.g., mastery learning, is explained by their extended amount of structure. Besides, based on research on the effectiveness of educational treatments that take into account individual differences in learning (ATI), it can be concluded that, at least in some respects, there are substantial influences of student characteristics on the need for and the effectiveness of structure (Cronbach and Snow 1977).

It is interesting to note that one educational approach, problem-based learning, claims its effectiveness just because of a lack of structure. In problem-based learning (PBL) the learning process is initiated and guided by a sequence of problem tasks that are intended to trigger learning processes characterized by great intensity and self-maintenance power. Learning matter is not directly presented to students, but covered by tasks that are offered to students in a workbook. Working in a small group setting supported by a tutor, students analyze the problem that is extracted from the task description, discuss relevant aspects of the problem and hypothesize about possible conceptualizations and solutions. This 'thinking aloud' process promotes the activation of relevant preknowledge and makes students aware of uncertainties and gaps in their knowledge base. Spontaneously questions arise, that can be elaborated into 'learning objectives', giving a natural starting point to
students for processing subject matter in study books. Next group session findings are reported and discussed and acquired knowledge is checked and integrated. Students are to a large extent self-responsible for the choice and quality of learning activities. (See for a more extended description: Schmidt 1983; Moust and Nuy 1987.)

The model of an extremely loose learning situation leads some to great expectations about the value of this educational approach, for many others it rather raises scepticism. However, it should not be overlooked that the educational context in which PBL takes place also has other characteristics that, on the contrary, really can be seen as bringing structure into the learning situation, that is to say: (a) the whole task of studying a subject matter domain is subdivided into smaller parts presented to students by means of a sequence of (problem) tasks, giving 'organizational structure' to it, a scheduling of study activities in time; and (b) instructional activities are organized in small groups of about ten students guided by a tutor, giving a small scale atmosphere to the educational environment (here: university level), embedding learning activities in a 'social structure'. In these respects PBL contrasts positively with more traditional forms of education at university (Gaff, Crombag and Chang, 1976). It is quite possible that the other two structure dimensions compensate somehow for the lack of content structure in problem-based learning.

The differentiation of structure into several dimensions could give a useful perspective for a more elaborate analysis of interactions between characteristics of students' approach to learning and their appreciation of structure in the educational environment. Both De Volder and Collignon (1987) and De Volder, De Grave, and Dobbelaere (1988) failed to detect differences between students high and low in fear of failure in their appreciation of problem-based learning, which seems contradictory to general findings on interactions between fear of failure and structure in learning. This can be accounted for by the 'compensation hypothesis' mentioned above: it is conceivable that positive experiences on other structure dimensions eliminate possibly negative effects of the lack in 'content structure'. In the research reported here we explored, guided by this point of view, the interaction of study orientation and students' appreciation of structure.

More generally there is evidence of relationships between study orientation and students' evaluation of teaching and preferences for constrasting kinds of learning environments. Systematic differences has been found between students with a meaning orientation, adopting a deep approach in their studying, and students whose study orientations are dominated by a surface approach (Entwistle and Tait 1990).

In theories and research on student learning in higher education a distinction in three main study orientations is widely accepted, indicated respectively as meaning or internalizing orientation, reproduction or utilizing orientation, and achieving or strategic orientation (Entwistle, Hanley, and Hounsell 1979; Biggs 1978). Based on factor analysis results on data collected with the 'Inventory of Study Approaches in Problem-Based Learning' we subdivided the reproduction orientation into a 'dependence orientation' and a 'minimalistic orientation', resulting in a four-