SHORT COMMUNICATION

TESTING THE THEORY OF THRESHOLD CONCEPTS IN A CONTEXT OF DENTAL EDUCATION. PRELIMINARY ANALYSIS.

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This paper reports on the pilot phase of a phenomenographic study which explores the relationship between teachers' and students' perceptions of the curriculum and theory of threshold concepts, which claims that there are concepts in all disciplines which must be understood, if learners are to progress to a more advanced level of understanding. It is suggested that threshold concepts may represent ways of thinking and practising within disciplines [1]. In this study consideration is given to the troublesome aspects of knowledge as described by David Perkins (1999) [2] and further developed by Meyer and Land (2003) [3]. Researcher's intention is to investigate if students experience any conceptual difficulties and what the nature of these might be. Students' and teachers' accounts of how they perceive the dental curriculum might help to verify if there is a relationship between the curriculum and the theory of threshold concepts. Analysis of the troublesome aspects of knowledge may lead to the identification of threshold concepts in the dental curriculum.

Key words
curriculum, knowledge structures, threshold concepts, troublesome knowledge

Introduction

A growing body of research demonstrates that there is a strong relationship between the curriculum structure and student knowledge acquisition. It has also been postulated that students' approaches to learning might mirror the way the knowledge is delivered by teachers [4, 5]. The study draws upon the division of knowledge into linear and hierarchical structures which stems from three theories of education: Ausubel's Assimilation Theory [6], Novak's Human Constructivism [7] and Bernstein's Pedagogic Discourse [8]. There are two fundamental types of knowledge in the structure of dentistry: theoretical knowledge and clinical knowledge around which dental curricula are constructed. Operating between the theory and practice is the essence of dentist work. Therefore, dental undergraduates need to learn how to apply theoretical knowledge in the practice. The theory is represented by networks of understanding and the practical aspects of dentistry are taught in the clinic is described in literature as chains of practice [4]. Networks of understanding form a hierarchical knowledge structure in which all concepts are interrelated, whilst chains of practice represent clinical procedures described as linear sequences of isolated pieces of information. During the process of becoming a dentist students learn how to look after patient's oral health and how to provide the dental treatment. Without having developed networks of understanding a student might be able to provide dental treatment, however his ability to assess, diagnose, and plan it will be limited. Relying on chains of practice gives the learner very limited choice of selecting the best possible treatment. A broad range of interrelated theoretical concepts is necessary for making an informed clinical decision. Kinchin and others advocate that learning how to link the theory with practice might be possible through the acquisition of threshold concepts [4]. The theory of threshold concepts is focused on discipline specific learning and is underpinned by the idea that there are 'portals'

to be passed in all disciplines. These portals may represent ways of thinking within a discipline as well as a way of practising within that discipline. Experts from a variety of disciplines agreed that a threshold concept can on its own constitute, or its application lead to troublesome knowledge [9]. Passing through the threshold results in transformation of knowledge. It has been proposed that the possible function of the threshold concepts could be to close the gap between qualitatively different knowledge structures. Through the notion of troublesome knowledge this study attempts to explore these areas of the curriculum which may be the source of conceptual difficulties and struggles for the students in the learning process. The identification of the troublesome areas of knowledge may help to inform curriculum design so the barriers to students' understanding can be minimised, if not eliminated.

Materials and Methods

The focus on description of people's conceptions of the dental curriculum is informed by the phenomenographic framework which requires an explorative and interpretive approach [10] and is based on the assumption that these conceptions are the way of describing processes of learning and teaching or the meaning of disciplinary concepts [11]. A qualitative method was used to gather data using semi-structured interviews. Prior to the interviews the researcher undertook observations in the lecture theatre and in the clinic to inform the generation of interview questions. During one-to-one interviews the perceptions of 4 teachers and 4 undergraduate students were probed about the curriculum. Different sets of questions were given to each group. All interviews were recorded and transcribed.

Results

Analysis of the interview transcripts revealed themes among the staff and students which indicated that there might be problematic areas within the curriculum. Teachers reported discrepancies between the official and the delivered curriculum. The data suggest that members of the teaching staff have a limited understanding of the curriculum. Both groups of respondents emphasized the importance of one-to-one interaction in the clinic. Students' responses showed their learning struggles to be related to the ability of applying theoretical knowledge in the clinical context. Both students and teachers expressed their concerns about the knowledge content in the curriculum; however, the examples given were different. Students do not have a clear understanding why certain topics are the part of the curriculum. They question the relevance of some theoretical knowledge to the dentistry. While students complained about the overloaded curriculum, teachers' concerns referred to discrepancies between the official and the taught curriculum.

Discussion

Although teachers expect from students the ability to link in the general medical knowledge with practice, they do not seem to have a clear idea of how to teach that ability. Is has been proposed that the reason why the teaching of how to link theory with practice might be problematic is that teaching in the clinical context relies on tacit knowledge, which has been described as a knowledge that can be troublesome [2, 3]. The tacit knowledge is not easy to access and it can cause communication barriers between the teacher and the students [12]. Teachers understanding of the curriculum might also be linked to their beliefs' and intentions concerning the teaching [13] as well as to how they understand the subject matter [14].

Conclusions

This pilot study could only give some indications as to what the dental teachers and students think of the curriculum and learning. In the pilot I only interviewed clinical teachers as they responded positively to my invitation. Therefore, the next step is to interview lecturers not involved in the practical side of the dental education as well as senior academics and who perhaps are responsible for developing the curriculum. It would be interesting to compare different perceptions to see what they have in common and where they differ.

The application of the theory in the clinical context has been identified as a potential source of the troublesome knowledge. Although there were, a few topics and concepts reported as difficult, it is too early to speculate what the threshold concepts in dentistry are. Therefore, the issue of linking chains of practice with the relevant networks of understanding remains the main focus where the theory of threshold concepts is considered. The notion of troublesome knowledge in the process of becoming a dentist will be further explored in the main phase of this study.

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