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The influence of tutor training for peer tutors in the dissection course on the learning behavior of students

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ABSTRACT

Introduction: Student tutors in the dissection course are expected to meet high demands in their job, to fulfill these expectations they receive training. Combined tutor training is well accepted by tutors and tutees, however, it is not known how tutor training influences student learning. Deduced from the learning goals of the tutor training, a randomized, controlled, single-blinded study was set up with a quantitative cross-sectional analysis to compare student learning behavior.
Methods: A total of 197 medical students, coached either by ten trained or ten untrained tutors, were enlisted in the study. To assess the students' learning behavior we employed the LIST questionnaire. A common factor analysis was calculated to extract dimensions. Factor scores of the extracted dimensions were calculated for both groups to estimate differences in learning behavior.
Results: Factor analysis of the LIST questionnaire revealed eight factors explaining 47.57% of the overall variance. The eight factors comprise: deep learning, attention, learning organization, cooperative learning, time management, learning effort, superficial learning and learning environment. Comparing the factor scores of the extracted dimensions, students coached by trained tutors learned significantly more with their fellow students (factor score in cooperative learning 0.194 vs. −0.205, $p < 0.05$), than students trained by untrained tutors. Students coached by trained tutors also tend to be better organized in their learning (factor score in learning organization 0.115 vs. −0.122, $p = 0.16$).
Conclusion: The learning behavior of students coached by trained tutors differs from the learning behavior of students coached by untrained tutors. Students coached by trained tutors learn significantly more often in teams than their colleagues and are better organized.

1. Introduction

Tutor training has become an important component in successful peer teaching concepts (Andrew Jay et al., 2013; Dandavino et al., 2007; Lachman et al., 2013; Pasquinelli and Greenberg, 2008). Institutions introducing problem-based learning were first to think about curricula for training peer tutors (Grand'Maison and Des Marchais, 1991). Similar faculty development programs were introduced for practical skills curricula (Weyrich et al., 2008). Peer-assisted learning also has a long tradition in anatomy, in the case of the Institute of Clinical Anatomy and Cell Analysis Tuebingen it dates back more than 100 years (Moerike, 1988). In continuation of the tradition, and inspired by the development of tutor training programs, a needs assessment led to the development of a new tutor training program for the dissection course (Shiozawa et al., 2010a).

The tutor training in Tuebingen is realized in a three-week combined technical and didactical program (Shiozawa et al., 2010a), preceding the dissection course in which the tutors then take care of their peers. The learning objectives for the didactical training provide modules for the role of the tutor, giving effective feedback, promote active learning and group dynamics. The learning objectives for the technical training involve dissection and prosection of difficult and complex topographic regions. The training program prepares the tutors for their task to teach and support their peers, and is well accepted by tutors as well as tutees (Shiozawa et al., 2010b).

It has been proven that peer teaching with student tutors is effective for the tutees (Bridgham and Scarborough, 1992; Shields et al., 2007; Topping, 1996; Torke et al., 2007; Trevino and Eiland,

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1980; Walker-Bartnick et al., 1984). However, it is not exactly clear how this effect is actually achieved. In consistency with the common measures of academic performance, also applied in the cited publications, it would be logical to assume that peer teaching with student tutors should benefit student learning. Learning in the academic context is a largely self-regulated process. Different models put the cognitive and motivational aspects of learning into conceptual frameworks, among which the self-determination theory by Deci and Ryan (1985) is the most common. This theory states that the learning outcome is determined by the degree of committing oneself to the learning subject. Prenzel (1993) and Schiefele et al. (2003) applied this concept to academic learning, developing measures and identifying categories of learning behavior. According to this concept, learning motivation holds a central position in the choice and appliance of learning strategies, which then again determine the quality of the learning outcome; i.e., academic performance (Schiefele et al., 2003). Wild and Schiefele validated this concept in the academic context (Wild and Schiefele, 1994), which is the reason this study refers to this established conceptual framework.

If student tutors have an effect on the students' academic outcome, they should also have had an effect on the students' learning process. Tutor training should consider student learning and furthermore facilitate and improve it, in order to enhance the academic performance of the tutees. This study was set up to investigate the quality of student learning in the context of peer teaching by tutors, who underwent a structured tutor training program.

The research question of this study is: What effect do trained student tutors have on the learning behavior of their tutees compared to untrained tutors in the dissection course?

2. Methods

To assess the tutees' learning behavior and determine effects of trained or non-trained tutors a prospective, controlled, randomized, single-blinded trial was set up. The study took place during the obligatory dissection course of the winter term in 2008/2009, with second and third term medical students participating. Students work in teams of ten, supervised by one student tutor. Student tutors are expected to watch over the dissection, facilitate the group work and help with learning. However, they are not supposed to replace the academic staff. The course covers eleven weeks of dissection with three sessions of three hours each week. Tutor training was accomplished as published previously (Shiozawa et al., 2010a). Peer-teaching by trained tutors represents the independent variable (compared to peer-teaching by non-trained tutors in the control group); the students' learning behavior is the dependent variable.

To adequately compare both trained and non-trained tutor groups we determined in- and exclusion criteria for the tutors. Inclusion criterion was academic progress to the second- or third-year of medical studies, exclusion criterion the previous teaching experience as a tutor in the dissection or other courses. This was to control longitudinal interfering effects from previous teaching experience, advanced academic studies or other training programs. Of thirty-seven tutors in the dissection course, twenty could be included in the study following the aforementioned selection criteria. Ten tutors were enrolled randomly in the training program, the other ten formed the control group.

To assess and compare student learning behavior, the inventory established by Wild et al. was used (LIST questionnaire, LIST = Lernstrategien Im STudium/learning strategies for academic studies) (Wild and Schiefele, 1994; Wild et al., 1992). The questionnaire is a common validated tool, based on the Motivated Strategies for Learning Questionnaire (MSQL) by Pintrich and De Groot (1990) and Pintrich et al. (1989) and the Learning and Study Strategies Inventory (LASSI) by Weinstein (1987). It covers different cognitive, meta-cognitive and resource-dependent learning variables.

The LIST questionnaire's inventory comprises 77 items in form of statements describing personal learning behavior, which are rated on a five-point Likert scale (1 = very rarely, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often). Wild and Schiefele extracted eleven factors, which describe different learning styles and environmental variables (Wild and Schiefele, 1994). The data from the questionnaires were analyzed in SPSS Statistics 17.0.1 (SPSS Inc., Chicago, IL, USA).

A factor analysis was calculated to test whether Schiefele's scales are also verifiable in the present study group. The calculation used the principal axis method and subsequent varimax rotation (Kaiser, 1958). Cronbach's α was determined to survey the internal consistency of the extracted factors. For the extracted scales, the factor score was calculated as an additional variable. The comparison of the factor scores was calculated with Student's t-test for independent samples. The level of significance was set to $\alpha = 0.05$.

The number of students and thus the number of peer tutors were limited to the number of admissions to the semester cohort. Given that the variance is stable, an effect size of $E > 0.5$ is reached with $n \geq 65$ ($\alpha < 0.05$, $1 - \beta > 0.8$).

The survey is single blinded, as the students did not know whether their tutor was enlisted in the training program or not. Students were assigned externally to the tutorial groups by the deanery of student affairs, so the distribution can be considered as randomized. The questionnaires were distributed and recollected on the same day, during the eighth week of the dissection course. To respect the tutors' personal rights and to match the data to the peer tutors, the questionnaires were tagged with a pseudonymous personal code of each tutor. Fig. 1 summarizes the study design.

The Ethics Commission of the Medical Faculty Tuebingen approved this research project with letters 296/2008A and 508/2008A.

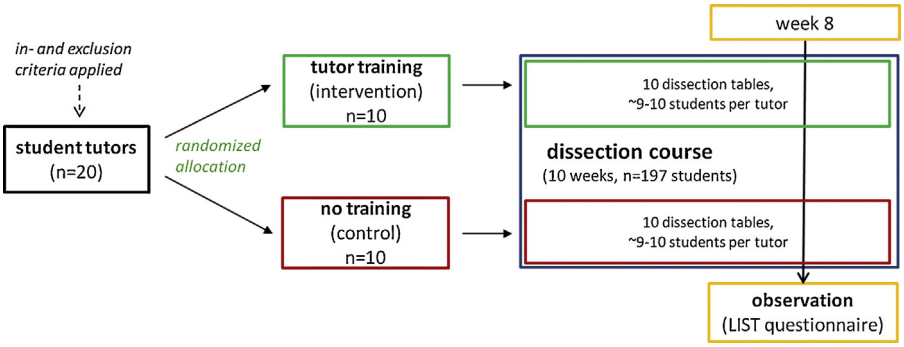

Fig. 1. Flow chart of the study design.

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