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Insights on best teaching practices for promoting students' learning

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Abstract: *The Department of Educational Sciences and the Department of Electronic & Telecommunications at the University of Aveiro (Portugal) have been working together with the Department of Computer & Information Sciences at the University of Strathclyde (UK), with the aim of improving the teaching and learning of introductory programming courses. Both institutions belong to the "European Consortium of Innovative Universities" (ECIU), with a commitment to "developing and implementing new forms of teaching, training, and research; to assuring an innovative culture within their walls; to experimenting with new forms of management and administration; and to sustaining and nurturing internationally-minded staff" (ECIU).Over the past two years, data has been collected through interviews, questionnaires and class observation, to better understand the organization of the different courses and approaches to teaching and learning. Members of academic staff have been actively involved in trying to enhance the students' learning experience through reflection on teaching methods and trying new ideas to aid student success. During this process we have assimilated insights on teaching philosophies, methods and suggestions for course redesign. As an important piece of the "puzzle", students also provided useful feedback on differing aspects of teaching and course organization. The present paper presents a meta-analysis of our findings on the relevance of teaching practices for promoting students' learning. In addition, we discuss the impact that teaching philosophies and course organization may have on best teaching practices.*

Introduction

There is considerable educational literature to suggest that student learning achievements are strongly related to the way students approach learning, which in turn is influenced by a range of personal and contextual factors (Marton & Booth, 1997). This complex process is described by Ramsden (1992) as a "heuristic, not deterministic" model of learning (Ramsden, 1992, p.84). An understanding of the students' learning outcomes supports the development of "points of intervention to enhance the quality of student learning by changing the curricula we construct, the teaching methods we use, and the ways in which we assess our students" (Ramsden, 1992, p. 84). Within this perspective, academics must appreciate the importance of the students' model of learning and teaching practice for achieving the desired student success. Thereby, exploring teaching philosophies and students' views of teaching practices yields insights on the teaching and learning process in higher education. In addition, an appreciation of courses conception and curriculum design complement this understanding and contribute to a more reliable and valid study.

Design of the study

The authors selected to follow a multiple case study (Yin, 1994) embodied in an action research methodology. Multiple case studies may be held in national or cross-national settings. In this instance, we chose to develop a cross-national case study (kohn, 1989) with two units of analysis. Our sample is constituted by students and lecturers from introductory programming courses at the Universities of Strathclyde (UK) and Aveiro (Portugal).

Different types of research methods were interrelated to bring more reliable data (Yin, 1994). Aiming to analyse the students' perception of their lecturers and teaching practice and the influence that those perceptions might have on students' attendance at lectures, motivation for the course and expectations, the authors designed the "Programming Course Experience Questionnaire" (PQEQ). This questionnaire was based on some items of the "Course Experience Questionnaire" (Ramsden, 1991) and the "Students' Evaluations of Educational Quality" (Marsh, 1987). Some of the items were reformulated and others translated from the original. Nevertheless, most of the items were adapted to the Portuguese and Scottish contexts and also considered suggestions from lecturers at these institutions.

A series of structured and semi-structured interviews were employed to collect academics views on the relevance of pedagogy for teaching quality and students' academic success and the relevance of teaching training for university lecturers. In addition, class observation was undertaken for a better understanding of the course organization and the students' involvement in class.

The validity and reliability of the constructs, as well as the detailed findings of each research method have been reported in national and international proceedings, journals and books (c.f., Huet, Pacheco, & Tavares, 2003; Huet, Tavares, Weir, Ferguson, & Wilson, 2003; José Tavares, Brzezinski, Huet, Cabral, & Neri, 2001; J. Tavares et al., 2004).

Teaching philosophies

Three lecturers at the University of Aveiro believe that students' learning outcomes depend mainly upon the students themselves and that teaching does not necessarily enhance learning if students are not motivated to learn. There is still a present idea that a substantial part of university learning can take place "apart from lectures and other formal classes" (Ramsden, 1992, p. 88). This idea implies that teaching is not so relevant after all. If students are motivated and interested to learn, teaching might be considered as secondary since students will look for information in other sources of knowledge. Ramsden (1992) emphasized the idea that there is a myth in the culture of university teaching and that "learning is something separate from teaching" (p. 88).

The authors conclude that the majority of the surveyed academics attribute to the learner the major role for his or her learning achievement, followed by the design of the course

and curriculum. Teaching will enhance learning if these conditions are applied. Teaching is perceived in conjunction with the design of the course and curriculum. These academics feel constrained in adjusting their teaching if the course design and curriculum are not the most suitable one. Indeed, data revealed a significant correlation between the curriculum design and students' motivation and academic achievement (c.f. Huet, Pacheco & Tavares, 2003). The authors also concluded that curricular redesign of introductory programming courses led to different teaching approaches which thereby enhanced student learning.

Good teaching

Research indicates that "enthusiastic teaching may lead to greater student involvement and commitment to the subject, while its lacklustre and rambling counterpart results in negative attitudes and a sense of futility" (Ramsden, 1992, p. 73). Nevertheless, research also suggests that a good performance or a "colourful presentation" (Ramsden, 1992, p.74), does not necessarily means good teaching and that students are often quite critical on this issue.

In spite of lecturers' doubts about the reliability of the students' evaluations of teaching, Ramsden argues that students are "extremely astute commentators on teaching" (Ramsden, 1992, p. 89). Marsh (1982, 1984) concluded that "student ratings are clearly multidimensional, quite reliable, reasonably valid, relatively uncontaminated by many variables often seen to be useful by students, faculty and administrators".

Nevertheless, the students' ratings of teaching do not necessarily improve teaching. It is necessary to present the results in a way that leads lecturers to reflect upon that information and make necessary changes in their teaching.

Partnerships of learning

Since the beginning of our study, lecturers from both institutions showed interest to be updated with the results of the research and to discuss the findings with the researcher. Furthermore, appropriate feedback was given through the organization of seminars and individual meetings. One major objective addressed in this study was accomplished, since academics showed an increased interest in pedagogical issues and some actually participated in educational research projects. As an outcome of this activity we have two papers published at the Frontiers in Education Conference, involving programming lecturers and the organization of two seminars held in both institutions. This joint work proved positive since it established time for lecturers to reflect on teaching practice and possible strategies to improve their teaching performance.

Conclusions

Close inspection of the findings from qualitative and quantitative studies reveals that academics are concerned with the causes that lead to students' retention and academic failure. From the outset of this research, academics demonstrated a strong interest and curiosity to know how their foreign colleagues approached teaching, how different courses' and curriculum designs could affect teaching approaches and what would be

the impact of teaching best practices for the students' learning outcomes. Indications are that such reflection is a positive step toward recognising the learning needs of students.

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