

Students' questioning and academic development in Higher Education: Bringing together practice and research

Portuguese higher education institutions are undertaking a challenging process in moving from a teacher-oriented approach to a student-focused approach (Veiga & Amaral 2009), competences where questioning plays a central role. Questions can help to scaffold ideas, organize tasks and encourage reflection (Watts & Pedrosa-de-Jesus, 2006). Therefore, the promotion of a true spirit of inquiry can improve the quality of teaching and, consequently, the quality of learning (Chin, 2007; Chin & Osborne, 2008; Pedrosa-de-Jesus & Moreira, 2009). Despite these benefits, several studies emphasise the passive attitude of undergraduate students during university lectures (Gunel 2008; Pedrosa-de-Jesus & Moreira 2009; Lopes, Moreira & Pedrosa-de-Jesus 2012), advocating the urgency in rethinking classroom strategies for promoting true enquiry environments. The design and implementation of student-centred approaches, in order to enhance deep and active learning, requires the alignment between teaching strategies, learning outcomes, and particularly assessment methods, with strong influences on students' approaches to learning.

Recognizing the pedagogical value of questioning, several research projects in the field of science education have been developed since the year 2000 at the University of Aveiro. The work reported here, concerning two PhD projects, that has been conducted since 2007. Both projects involve the collaboration of five professors from the Biology Department and a mean number of 150 students attending their classes in each academic year. The first project, entitled "The role of questioning in aligning teaching, learning and assessment" (SFRH/BD/27871/2006) is mainly concerned with the promotion and development of students' questioning skills through the adoption of innovative teaching, learning and assessment strategies. The second project, "Preferential approaches to teaching and teachers' questioning practices: a study in Higher Education of Biology" (SFRH/BD/44611/2008), aims at understanding how teachers deal with students' questions and how they are able to integrate those questions in their own questioning practices. The obtained knowledge has been integrated on the design of academic development strategies.

Both projects have adopted a Co-researcher Model (Macaro & Mutton, 2002), allowing both the researchers and the teachers involved to benefit from the enterprise. First the researchers had the opportunity to develop their work in natural teaching and learning contexts. Second, the teachers were encouraged to reflect on data collected from their own classes, obtaining support for the adoption of innovative strategies. Data was collected through non-participant observation of classroom activities and e-learning environments, with special emphasis on the questioning interactions between teachers and students. Audio support was used to aid the transcription of questioning episodes. Semi-structured interviews were also conducted with the teachers and selected students at different moments of the projects. All the written documents produced by the participants, as a consequence of the research innovations introduced, were also selected for analysis. Since the data gathered is mainly qualitative and descriptive, the main methodology adopted has been content analysis (Tuckman, 1999).

In this presentation we will describe the main conceptual and methodological insights of both projects, illustrating the main results achieved, in order to promote discussion and reflection

about the interplay between research and practice concerning students' questioning and academic development.

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