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(a) Assistant Professor; margarida.pinheiro@ua.pt(b) Assistant Professor; c.s.sarrico@ua.pt(c) Associate Professor with Aggregation; santiago@csjp.ua.pt**Abstract:**

This study reports a case study experience of a PBL (either as project-based learning or problem-based learning) methodology in simulated environments in a vocational higher education.

Keywords: methodologies, higher education, learning, teaching, PBL, simulation.

Context:

PBL was introduced to produce adaptable and competitive graduates whose professional competences are well attuned to the demands of a rapidly changing world.

The idea of PBL as enhancing new work values, from the collaboration between interested parties (students, academic staff, employers, and graduates) seems important to analyze the pertinence of an alliance between pedagogical and professional practices, and also between the elements considered fundamental for the enrichment of the professional profile of the individual (social and personal factors).

Given this outline, the empirical study assumes as its object the course of *Projecto Profissional* (Professional Project) in ISCA-UA (Higher Institute of Accounting and Administration of the University of Aveiro).

The context explored in this study refers to the pursuit of a wide interface between academic and professional environments, involving different working areas in a multidisciplinary perspective. Being the aim of the Professional Project the applied integration of knowledge in a global perspective, capable of intensifying professional, personal and social skills in the future graduates, it seemed obvious to think over the methodological frame of the syllabus. As an answer to that problem and fitting in new emergent methodologies, the Professional Project runs in a simulation and virtual environment, following a PBL methodological type either in a project based learning mode or in a problem based learning way.

Objectives of the study:

From a vast amount of research of the state of the art about teaching methodologies and learning processes, a need was felt to review other subjects, such as the mission of higher education, traditional and modern teaching methods, how these concepts affect the curriculum, how PBL can improve learning, and the role of simulation in learning. From these explanations the specific objective of this study is to understand and to analyze the potential effects of a PBL methodology in simulated environments, from the perspectives of students, academics, employers and graduates.

Research method:

This research employed a qualitative and a quantitative research methodology. Relatively to the quantitative line the data collection was informed by the application of enquiries near the students and graduates that attend the course. Jointly, the strategy used in the qualitative data made use of interviews to academics involved in the Professional Project and to employers who, among its employees, also engage professionals with the course.

To provide anonymity, none of the participants are named. All partakers were fully informed about the study in advance.

The study was performed among all the students during one of the semester's editions of Professional Project and the enquiries were done to all the graduates involved in the course since it begins in 1996. The students did it in the class and the graduates were asked to send their answers by post, and all enquiries sent included an enveloped already stamped and addressed to the investigator. In this terms, the study carried 132 out of 138 students inquires (96%) and 423 out of 881 graduates inquires (48%).

Either enquiries to the students or to the graduates were firstly experienced with a few elements of each group, randomly selected. This enabled to test if the proposed model was not misunderstood and to clarify some of the questions. The planned form was constituted based on reviewed literature about PBL and simulation environments as well as the investigation questions of the research.

All the inquests were attached with filling up instructions and their treatment enfolded optical lecture made possible by a bar code. The processes of digitalization made use of a Cardiff Teleform package. With this we tried not only to minimize potential errors but also to accelerate the data analysis.

The analysis of the quantitative data made use of the SPSS package (statistical package for social sciences).

The academics approach focused in those that have been engaged with the Professional Project for, at least, four years. Fourteen academics were interviewed. A semi-structured interview guide, including six domains, was used: (1) professional competences, (2) social competences, (3) self competences, (4) methodologies and learning processes, (5) motivations and performances, and (6) assessment.

Similarly, the employers semi-structured interview guide, included seven domains: (1) professional competences, (2) social competences, (3) self competences, (4) methodologies and learning processes, (5) motivations and performances, (6) the paper of simulation in working integration, and (7) paper of simulation in the decision of a business creation.

All the interviews were audio-taped and transcribed. Qualitative characteristics were noted with the NUD*IST package (non-numerical unstructured data indexing searching and theorizing).

Results and discussion:

The obtained results understood by the graduates are more consistent with PBL theoretical advantages, than the ones hinted by undergraduates. This differentiation is possibly due to the students' reflections upon ideological fields while graduates' reflections concern their daily practice. Comparatively, employers have exposed a high contrast between PBL graduates and the remaining ones, with the formers denoting a more satisfactory professional global vision.

Despite the fact of the advantages recognized by the graduates that have experienced a PBL methodology type course in simulated environments, this return appears to be particularly worthwhile in early stages of professional integration.

The results also explore that simulation learning in vocational higher education help on a positive and attractive attitude that enables a softer changeover between the academic and the professional world. As well, the interdisciplinary as academics see it, is highly near PBL theories, mostly in what concerns the knowledge production strategy.

Unlike the theoretic argument that PBL theories is a worthwhile for employers, those have let it be known that graduates, although may possess a substantial stock of skills, do not always know how to use them correctly. Assuming the huge importance for vocational higher education institutions to satisfy employers' future prospects, the problem is to know how the prospective analysis of the effective needs of entrepreneurial organizations is done. Using this as a starting point, maybe it becomes indispensable to bring in some assessment structures that can clearly identify the enterprises' requests.

Concluding remarks:

It looks like that PBL methodologies in simulated environments add more value, essentially, at the beginning of the graduate's professional career, but there were concerns about what it seems to be a gap between employers and other stakeholders regarding, especially, social, personal and learning competences. A key impediment to such engagement was the differences in perception of the type of competences truly valued by employers.

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