

Learning in a real context – a case study in Portuguese higher education

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SUMMARY

Relations between higher education institutions and local companies are generally considered to be very important to the success of education provision and for the social fabric surrounding the school. This article describes a case study of bringing together two parties with an interest in the school's action: students and companies. Group work as an assessment tool for resolving a specific problem or analysing a business situation in detail, when carried out in businesses, allows learning to take place in an everyday context. This helps both students and companies to achieve their objectives – learning and academic success for the former and the exchange of knowledge with a collaborative school open to its local environment for the latter.

Keywords

Educational innovation, social partners, pedagogy, examination, problem based learning

Introduction

Since 1973, Portuguese higher education has been organised as a binary system – university education and polytechnic education – with distinct conceptual and educational frameworks (Simão et al., 2005). University education, geared towards research and the creation of knowledge, seeks to provide broad-based scientific know-how to underpin solid technical and cultural training in order to ensure high individual autonomy in relation to knowledge, including the possibility of applying such knowledge, particularly for the purposes of integration into the labour market. Polytechnic education, geared towards understanding and resolving concrete problems, seeks to provide scientific know-how, with emphasis on its application, to underpin solid technical training. The aim is to ensure high autonomy in relation to knowledge as it is applied to professional activities, and to actively participate in development action ⁽¹⁾.

Managers need to combine the theoretical knowledge required to perform their duties with the capacity to work in a team, to communicate appropriately and to develop a process of permanent learning. The latter need is very important because, since businesses exist in constantly changing environments, managers must be able to identify, analyse, assess and implement solutions for new problems. Problem-based learning (Hmelo-Silver, 2004) allows learning objectives to be adapted to each company's specific circumstances, since students can, within certain limits, adapt to the above specific needs.

One of the most recent models for assessing the performance of an organisation on a conceptual basis, the performance prism (Neely et al., 2001), introduces the novel idea of including the organisation's stakeholders in the model from a dual perspective – both what they expect of the organisation, and what they can offer the organisation so that it can continue to deliver value to society. This new strategic approach seems to recognise that organisations do not wish merely to deliver value to their stakeholders, but also to establish more lasting, cooperation-based relations with them (Donaldson and Preston, 1995).

Group work by students within the local business environment therefore reinforces such relations: the Escola Superior de Ciências Empresariais (ESCE) [Business School] links with local businesses, providing them with new knowledge without compromising business decisions taken previously; businesses open their doors to students who are able to think critically and who are not constrained by the various needs of the company itself (i.e. the need to ensure that it functions profitably and is environmentally friendly and socially re-

(1) Basic Law on the Education System; Article 11(3) and (4), Law no 4/86 of 14/10, and Law no 49/2005 of 30/08.

sponsible). The objectives set out above (the link between the School and society, especially businesses), are the fundamental aspects of the work analysed in this article.

This paper is organised as follows: after the introduction, the theoretical bases of problem-based learning or the analysis of business contexts are presented; an explanation is then given of how the stakeholders were identified; where they seek to promote the educational institution's mission and objectives; the learning process and the principal social partners affecting and being affected by the ESCE's teaching activities. Section 3 presents the teaching environment of the subjects involved. Section 4 analyses the importance of the work carried out, both for students and for host organisations. The results are validated in section 5, when the sample is expanded. Section 6 presents the main conclusions.

Learning method and stakeholders

Foundations of problem-based learning

Problem-based learning began in the 1960s at McMaster University's Faculty of Medicine in Hamilton, Ontario, Canada (Camp, 1996; Herried, 2003), and was restricted for many years to the training of health professionals. The success achieved in this area saw the method extended to other areas of knowledge, such as engineering, business management, economics and sociology (Camp, 1996). The method focuses on student participation, the development of critical thinking and self-directed learning in connection with real problems.

Under this method, students are organised into small groups overseen by a tutor. They are then presented with a problem (brief description of a problematic context) that often occurs in day-to-day business and which must be explained or resolved by corrective action (Schmidt, 1993); this functions as the starting point for learning. The problem itself, group work, individual study and the tutor's role are the main components of the method (Schmidt, 1993). The aim is for students to develop their ability to direct their own learning independently, rather than expecting the tutor to wield total control over the definition of learning objectives, resources and methods. The tutor's role is to provide support for the work of the group, ensuring that it engages in appropriate learning behaviour. He or she raises relevant questions that help the group to reflect more deeply on its objectives, on points to be improved and on contradictions to be clarified. The tutor is also responsible for fostering group dynamics to make sure that all members contribute, particularly those with the greatest difficulties in this area, and for developing learners' ability to work in a team (Schmidt, 1993).

Problem-based learning is founded on certain premises. It stresses the importance of students' prior knowledge of a subject, which is the most important determinant of the nature and amount of new information that can be processed. It suggests that prior knowledge needs to be activated by means of cues in the context of which the new information is being studied, thus enabling links to be established between this new information and the prior knowledge. The way knowledge is structured in memory, in semantic networks built on concepts and their interrelations, influences the potential for using existing knowledge. Storing information into memory and retrieving it can also be improved when students are in some way able to elaborate on the new information during the learning process. The contextual dependency of learning presupposes that the activation of knowledge to be used at a future point in time is facilitated when the context in which it was learned and the context in which it must be used are similar. Finally, students' intrinsic motivation favours an increase in the time devoted to studying, and consequently the achievement of better results (Schmidt, 1993). In addition, the contextualisation of learning and group work aimed at clarifying one's own point of view and being confronted with different perspectives tends to stimulate student creativity and intrinsic motivation in relation to the subject being discussed (Lowry and Johnson, 1981).

Identification of stakeholders

The pedagogical assessment process is consistent with the perception of the school as an open system following a contingency approach, which attaches importance to changes or uncertainties in the environment, technology and internal structures of an organisation (Boddy, 2002). This means that the assessment is more personal and objective and is not confined to the classroom. This type of work therefore seeks to counter passive knowledge-absorption strategies and to promote an active, participatory attitude among students, motivating them to apply knowledge transmitted in the classroom to a specific problem and getting them to work in a team. In its pedagogical function, assessment is thus seen as an essential element in the teaching and learning process.

Among the many criteria according to which group work in a real context can be assessed, only the three considered to be the most relevant in this case will be covered:

- a) Mission and objectives of the ESCE;
- b) Bologna Process;
- c) Identification of stakeholders.

The ESCE is a faculty of the Instituto Politécnico de Setúbal. It was founded in December 1994 and currently offers six graduate courses: Accounting and

Finance, Human Resources Management, Marketing, Distribution and Logistics Management, Information Systems Management and Accounting and Finance as an evening course. Two postgraduate courses are offered: Hygiene and Safety at Work, and Taxation. According to its statutes, the ESCE is responsible for teaching, researching and developing business sciences, dignifying humankind and promoting the development of the Setúbal region and the country.

In terms of the 'Bologna Process', Valente (2005) suggests that the recipe for Bologna should be seasoned with the problems of each region and each institution, which must therefore be able to find innovative solutions. Student-centred learning will change mindsets and attitudes, and the enterprise and forms of working. Since the aim is to establish a strong link with the business world and with real life, the region in which educational institutions are based will also have responsibilities in the learning process. This link can be ensured through group work by students, with a minimum number of hours of work in businesses, and by problem solving. Educational institutions will thereby constantly observe the business world through regular contacts between their members (teaching staff, students, administrative staff) and the enterprise. The principal stakeholders (Freeman, 1984) of a polytechnic higher education institution will include its students and regional businesses. This paper therefore seeks to determine how far carrying out a project in companies, in two subjects, helps the region's students and businesses to achieve their objectives. The objective of students is to translate their practical learning into academic success. Educational practices that help transform this work into positive academic results can thus be classified as beneficial to students. The region's businesses, on the other hand, wish to be able to draw on a pool of business-qualified human resources familiar with the regional business environment. Educational practices that foster this objective will be perceived to correspond to their interests.

The Setúbal peninsula is part of the Lisboa e Vale do Tejo region (RLVT), and comprises nine municipalities: Alcochete, Almada, Barreiro, Moita, Montijo, Palmela, Seixal, Sesimbra and Setúbal. The resident population was 714 589 inhabitants in 2001 (around 7 % of the Portuguese total). It stands out as a very attractive region, with inflows of people from other regions of the country and other countries which are classified as internal and international migration flows respectively. The international migration flows are made up of Africans, Brazilians and, more recently, Eastern Europeans. It should be noted that in many cases their living and working conditions give rise to serious social problems which are currently far from being resolved, like exclusion, drug addiction and crime (Rebelo, 2000). In response to these social problems, in 2001 the Setúbal district recorded the greatest number of new social facilities (due to previous shortcomings), with 160 new social institutions

coming into operation. Unemployment in the Setúbal peninsula is consistently higher than the national rate. In 1991 it was almost 4.1 % higher, while in 2001 it was 2.1 % higher (Mata et al., 2005). As at national level, SMEs predominate in the Setúbal district, having grown in the three-year period from 2000 to 2003, both in terms of the number of units and in terms of employment and turnover. The number of large enterprises has fallen, leading to a reduction in jobs (INE, 2005).

Teaching context of the subjects under study

The methodological focus of the subjects studied is student participation, the development of critical thinking and self-directed learning by resolving problems arising in day-to-day business. Students choose companies generally according to convenience, their personal acquaintance with someone who works there, the company's willingness to accept them and the geographical proximity of the ESCE or the area in which the students live ⁽²⁾. The same method is suggested for working students, who may, however, come to agreement with their tutor on a different but equivalent means of participating in problem solving. The two subjects under study are common to the ESCE's courses.

The main aim of this paper is to determine the importance of working in a group, focusing on resolving a problem or describing a business situation in detail, under a system of continuous assessment ⁽³⁾. This section therefore addresses the objectives, the regional and sectoral scope and the perceived association between carrying out the work and success in the subject.

⁽²⁾ Research into the reasons for choosing companies was done in the validation semester. Of the 28 groups surveyed, 20 % attached the greatest importance to the proximity of the premises to the ESCE or the students' homes, while 40 % attached the greatest importance to interpersonal contacts.

⁽³⁾ This paper presents the guidelines and principal findings of a research project which, based on data for the 2004/2005 academic year, aims to determine the results of the teaching and learning method – Group Work in a Real Context – both in terms of meeting students' expectations and meeting the host organisations' expectations (Seabra et al., 2006). The preliminary results of the research were presented at the XVI Jornadas Luso-Espanholas de Gestão Científica, organised by the University of Évora and the University of Seville in February 2006, and were published in the conference proceedings. This article, which was part of the work presented at the Conference, includes a validation of the results based on the first semester of the 2005/2006 academic year, and a survey of students that sought to understand what they thought about the method concerned.

⁽⁴⁾ The students were mostly overseen by the managers themselves (46.4 %), with an average of two interviews, based on a questionnaire given to the students in the validation semester. The questionnaire indicated that 3.6 % of the groups felt that the company provided little support. The information provided by the company arose in visits to factories (82.1 %), working meetings in which clarification was provided (82.1 %), clarifications by e-mail or telephone (60.7 %), and the sharing of institutional information (53.6 %).

The place of the two subjects in the curriculum of the respective courses is as follows:

Courses	Operations Management Principles	Planning and Management Control
	Year / semester	Year / semester
Accounting and Finance	2nd year/1st semester	3rd year/2nd semester
Human Resources Management	2nd year/2nd semester	2nd year/2nd semester
Marketing	2nd year/2nd semester	2nd year/2nd semester
Distribution and Logistics Management	1st year/2nd semester	2nd year/2nd semester
Information Systems Management	3rd year/1st semester	2nd year/2nd semester
Accounting and Finance (evening course)	2nd year/2nd semester	2nd year/2nd semester

This paper analyses data relating to Operations Management Principles and Planning and Management Control because students can prepare projects for both subjects with the support of one and the same company. If they wish to take this approach, students can analyse a company more broadly than when they opt to contact two companies, one for each project. Students must draft two reports in both cases, defending them in discussions with tutors, since the assessment process takes place autonomously, which means that projects based on the same company may produce results that do not coincide.

The results for the 2004/2005 academic year (both semesters) are analysed below.

Subject: Operations Management Principles (OMP).

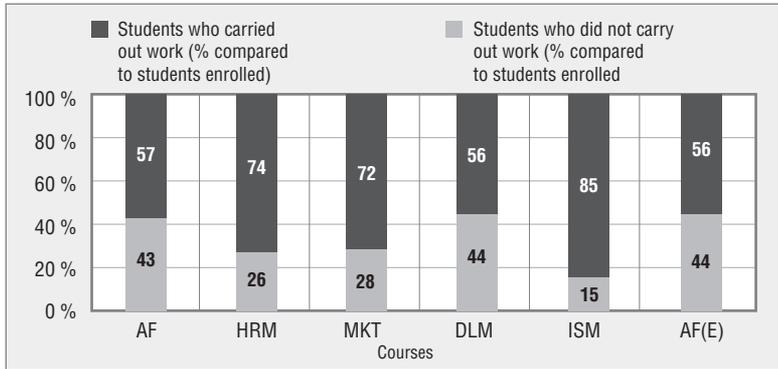
Operations Management Principles is common to all the ESCE's courses. It is taught in different years and semesters and runs in both semesters.

Group work and objectives

Students form groups of four or five members to carry out the continuous assessment work. The objective of the work is to understand how a company works, and the strategic and operational options it applies to its operations.

The group must identify a business in the industrial sector and, after obtaining their tutor's agreement, must ask the respective management if they are willing to be visited and to arrange workshop meetings so that the students can get to know the company and collect relevant documentation⁽⁴⁾. In preparing the work, the group follows a draft outline that can be adapted to the company under study, including a presentation of the company and its strategic approach to operations. The principal characteristics of its operations management must be presented.

Figure 1: **OMP. Student acceptance of continuous assessment work**



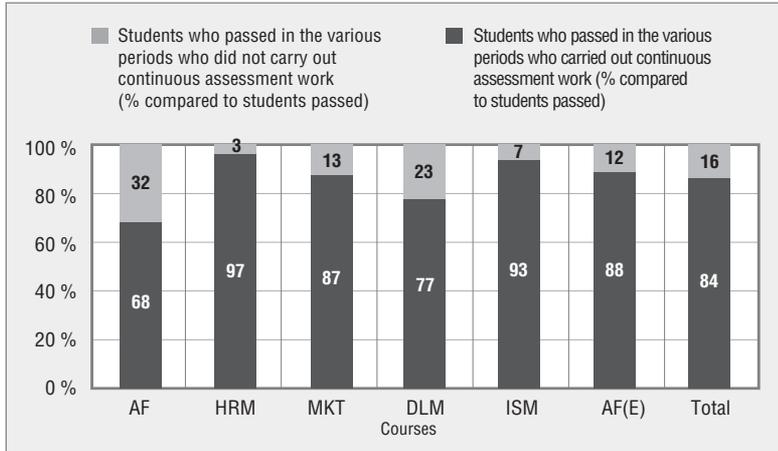
Acceptance of the group work represents acceptance of the continuous assessment process. After the report on the work is delivered, it is discussed by the tutor and the work group. In addition to preparing and discussing the work, the continuous assessment process also involves the sitting of a test. As can be seen from Figure 1, acceptance of the continuous assessment process is high.

Importance of the work to success in the subject

All students who passed by continuous assessment carried out the group work successfully (an essential condition). Students who opt not to accept or who fail the continuous assessment process provide evidence of their knowledge in an examination taken in the normal period or in the resit period. In this case the assessment involves a written test (examination).

The results show that the majority of students who passed the examination in the normal or resit period had already carried out the group work under continuous assessment. The overall results, shown in Figure 2, confirm the link between carrying out the continuous assessment work and passing the subject. In other words the majority of students who passed, irrespective of when they did so, carried out the work. An inverse reading is naturally not possible, since preparation and discussion of the work are supplemented by a test (under continuous assessment); success in the work does not guarantee success in the subject.

Figure 2: **OMP. Overall results (continuous assessment, normal period examination and resit period examination)**



Subject: Planning and Management Control (PMC)

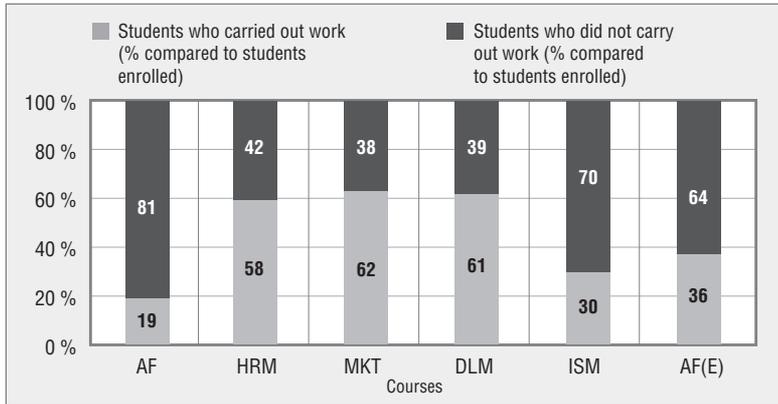
Planning and Management Control is common to all the ESCE's courses, although it is taught in different years and semesters. It runs in both semesters.

Group work and objectives

The method of assessment by group work is consistent with the continuous assessment scheme. The objective is to familiarise students with planning and management control methods. Groups of four to five students are organised to prepare the group work. Each group must identify a business in the industrial sector and, after obtaining their tutor's agreement, must ask the respective management if they are willing to be visited and to arrange workshop meetings so that the students can get to know the company and collect relevant information. Students are given guidelines in advance to prepare for the workshop meetings. These cover the structure of a report with a description of the company, an analysis of its main functions and its strategic aims. The assumptions for constructing the provisional components and the respective control instruments are also presented.

Acceptance of the group work represents acceptance of the continuous assessment process. After the report on the work is delivered, it is discussed by the tutor and the work group. In addition to preparing and discussing the work, the continuous assessment process also involves the sitting of a test. As can be seen from Figure 3, acceptance of the continuous assessment process is high.

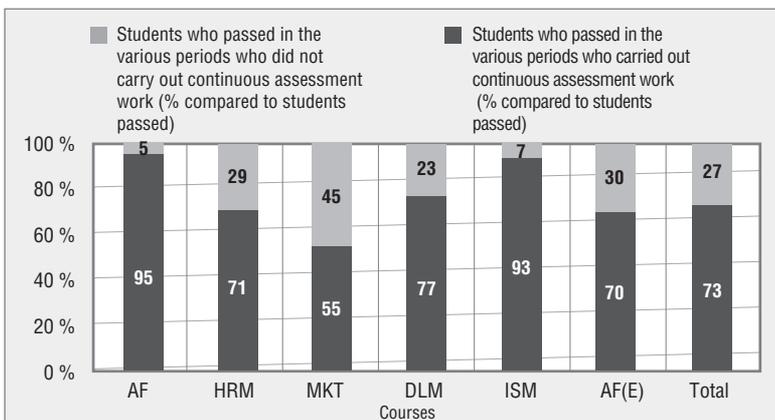
Figure 3: **PMC. Student acceptance of continuous assessment work**



Importance of the work to success in the subject

All students who passed by continuous assessment carried out the group work successfully (an essential condition). Students who opt not to accept or who fail the continuous assessment process provide evidence of their knowledge in an examination taken in the normal period or in the resit period. In this case the assessment involves a written test (examination). In overall terms the group work proved to be a student-friendly tool, 73 % of students passed having opted to carry out group work (Figure 4).

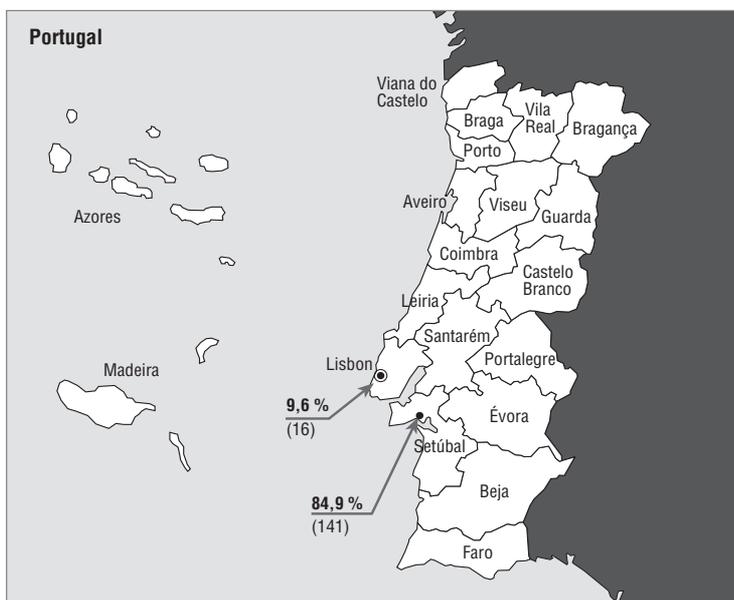
Figure 4: **PMC. Overall results (continuous assessment, examination in the normal period and examination in the resit period)**



Importance of the work to the host organisations

The study carried out on 166 projects (90 in OMP and 76 in PMC) shows that 84.9 % of projects were carried out in the Setúbal district and 9.6 % were carried out in the Lisbon district. The strong concentration of projects in the Setúbal district covers virtually all its municipalities, the most representative economic sectors being manufacturing industry (66 %), wholesaling and retailing (14 %) and the building trade (9 %).

Map of Portugal



To find out what company personnel who supported the students felt about the use of this continuous assessment tool, which clearly encourages the School and businesses to work together, a tutor asked a sample of 21 companies two questions by telephone. The sample includes companies that supported work in the area of OMP or PMC.

The questions were:

- 1- Did you have a good opinion of the group?
- 2- Do you think it is important to carry out work of this type?

These questions were designed to provide an understanding of behavioural aspects, interview preparation and the dynamism and interest shown by members of the work group. A total of 21 favourable answers were received to the first question, 15 company managers having a favourable opinion of the group,

five a very favourable opinion, and one an average opinion. No unfavourable responses were recorded.

All the managers felt that it was important for the School to encourage students to approach companies to carry out work of this type because:

- It allows the theory, practice and perception of the business world to be linked (84.3 %);
- It gives the School's teaching and research a higher profile (7.8 %);
- It allows students to come into contact with potential employers (7.8 %).

Some of the managers contacted ⁽⁵⁾ said that they were grateful they had been offered a copy of the work. Tutors inform students of this at the beginning of the process. Although the work is for academic purposes only, since most of the companies are small ones, it is for many of them their only opportunity to be assessed independently and at no financial cost.

Validation of results

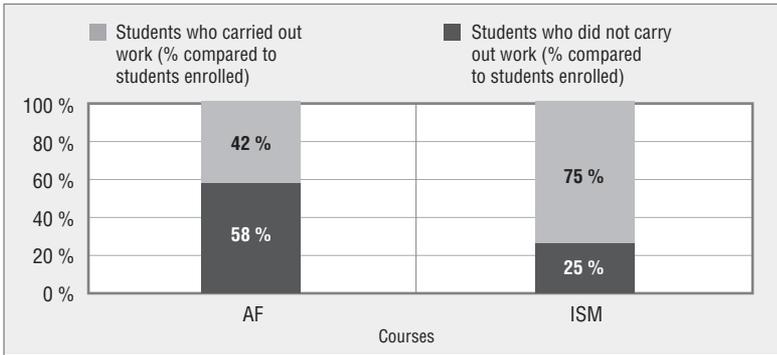
In order to validate the preliminary results, the results of the same pedagogical method used in the first semester of the 2005/2006 academic year were analysed.

Validation of academic success

Research was carried out into the subject of Operational Management and Planning, which is taught in the first academic semester for the Accounting and Finance and Information Systems Management courses. Another semester was included in this research work because of the need to introduce more students and more practical projects (31 projects) to ensure that any characteristics possibly associated to a specific academic year are eliminated from the results. The validation semester results indicate that acceptance of the group work was not as high as in the previous year, but remained very high in Information Systems Management (Figure 5).

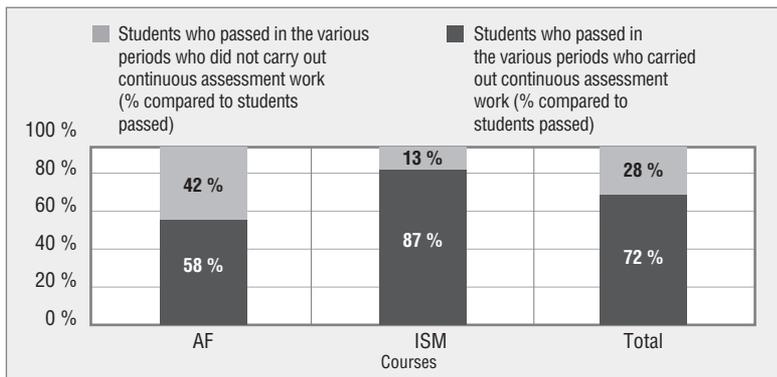
⁽⁵⁾ The companies were contacted by telephone to carry out this survey after the end of the academic year (July/05), when the assessment process relating to the year concerned had concluded.

Figure 5: Student acceptance of continuous assessment work



On the whole, considering all the periods, it can be confirmed that the number of students passed who carried out a project in a real context is greater than the number of students passed who did not do so. In this semester, however, there was an increase in success in the subject without the work in question being carried out (Figure 6).

Figure 6: Overall results (continuous assessment, examination in normal period and examination in resit period)



The geographic distribution of the work carried out confirms the strong regional coverage of the ESCE's area of intervention.

Validation of the survey of business managers

A further telephone survey was carried out ⁽⁶⁾ to validate the findings of the survey of businesses that hosted ESCE students in the 2004-2005 academic year, the same questions being put to a sample of 13 companies that hosted groups in the validation semester (around 41.9 % of the companies contacted by students).

The questions were once again:

1. Did you have a good opinion of the group?
2. Do think it is important to carry out work of this type?

A total of 13 favourable responses were received to the first question, with 69 % of managers having a good opinion of the group and 31 % a very good opinion. No unfavourable responses were recorded.

As regards the second question, all the managers felt that it was important for the School to encourage students to approach companies to carry out work of this type because:

- It allows the theory, practice and perception of the business world to be linked (92.3 %);
- It allows students to come into contact with potential employers (42.9 %).

The results of this second survey confirm the results of the survey of the preliminary research.

Survey of students

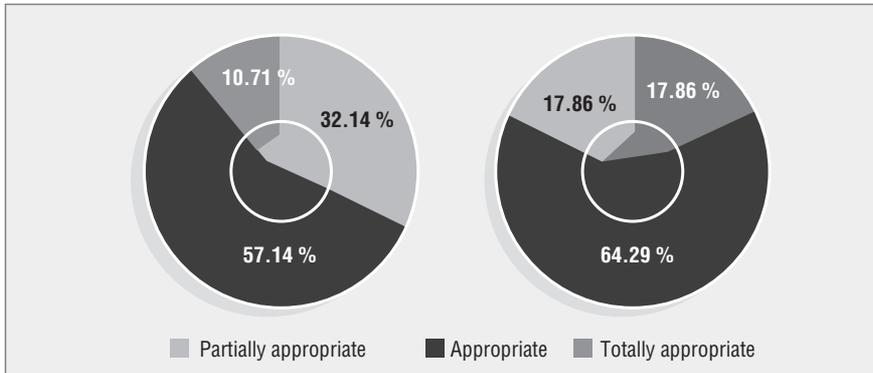
Data from the survey of students came from 28 responses received out of a total of 31 groups that carried out work. The survey was given to students at the end of the semester, with a specific assurance that it would have no effect on the group work assessment.

A majority consider the work to be appropriate for assessing knowledge (Figure 7) and appropriate for learning (Figure 8). The majority of groups do not think the work should be replaced by another assessment tool, and it was suggested that it should be given greater weight in the assessment system.

⁽⁶⁾ Contact was also made after knowledge had been assessed.

Figure 7
Degree of appropriateness
of work to assessing
knowledge

Figure 8
Degree of appropriateness
of work to learning



Around 75 % of the groups felt that the work presented to the tutor gave their members satisfaction (satisfaction or great satisfaction).

Conclusions

It appears that problem-based learning or the analysis of real business situations in companies and organisations helps to meet the expectations of two types of stakeholders of fundamental importance to higher polytechnic education institutions: students and local companies/organisations. Although some students pass exams in examination periods when this method is not used, the results for the target subjects in the three academic semesters analysed unambiguously show that participation in group work in a real context is associated to the success obtained. Such participation is therefore relevant to student success in terms of developing skills, though it is not a necessary condition for achieving that objective.

The following explanations can be given for this link:

- participation in preparing a group project of this type equips students to reflect and to integrate theory into practice. Students who take part in projects thus acquire skills that may not be acquired by others who do not use this tool.
- students who subscribe to a group project will be the students with better basic know-how, or who are predisposed to joining working teams and investing time and effort in them. These are the students who are expected from the outset to be more successful.

In the first case the group work produces effects, while in the second it demonstrates the effects. However, although further research is required, it seems clear that students benefit from carrying out group work in a real context.

The satisfaction shown by managers in the region who were contacted reinforces the conviction that interaction between the School and the business environment is essential for companies. Because of their receptiveness to cooperating with the School, however, care must be taken in interpreting that satisfaction, since it may be coloured by a certain paternalism.

The fact that the students surveyed consider the group work to be appropriate, both as a tool for assessing knowledge and for generating learning, also reinforces the importance tutors attach to the learning methods under study.

On the whole, the results obtained in the validation semester confirm the findings of the exploratory study carried out on the basis of data relating to the 2004/2005 academic year.

Finally, we believe that the 'Bologna Process' favours already enshrined student-centred learning methods. It can be seen that the majority of students who took the subjects of OMP and PMC and some of the businesses in the region surrounding the ESCE now demonstrate a spirit of cooperation. This is reflected in the integrated development of general and specific skills in areas of knowledge in business sciences and in interpersonal skills (related to problem solving, decision taking, learning to learn, research and the use of relevant information, reasoning, communication, cooperation, independence and creativity). The teacher acts as tutor or facilitator, focusing the teaching on the students, asking questions and helping them to be proactive.

Acknowledgements

The authors would like to thank the Department of Economics and Management, the *Escola Superior de Ciências Empresariais* and the *Instituto Politécnico de Setúbal*.

Special thanks are owed to all the organisations and their representatives who worked with our students.

We would also like to thank the students for their willingness to respond to surveys and thereby cooperate in this study.

We would also like to thank the participants in the 'Teaching Methods and Experiences' panel at the *XVI Jornadas Luso-Espanholas de Gestão Científica* for the questions raised and the discussion generated when the exploratory study was presented.

Thanks are also due to two anonymous referees whose criticism and suggestions have helped to improve this text.

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