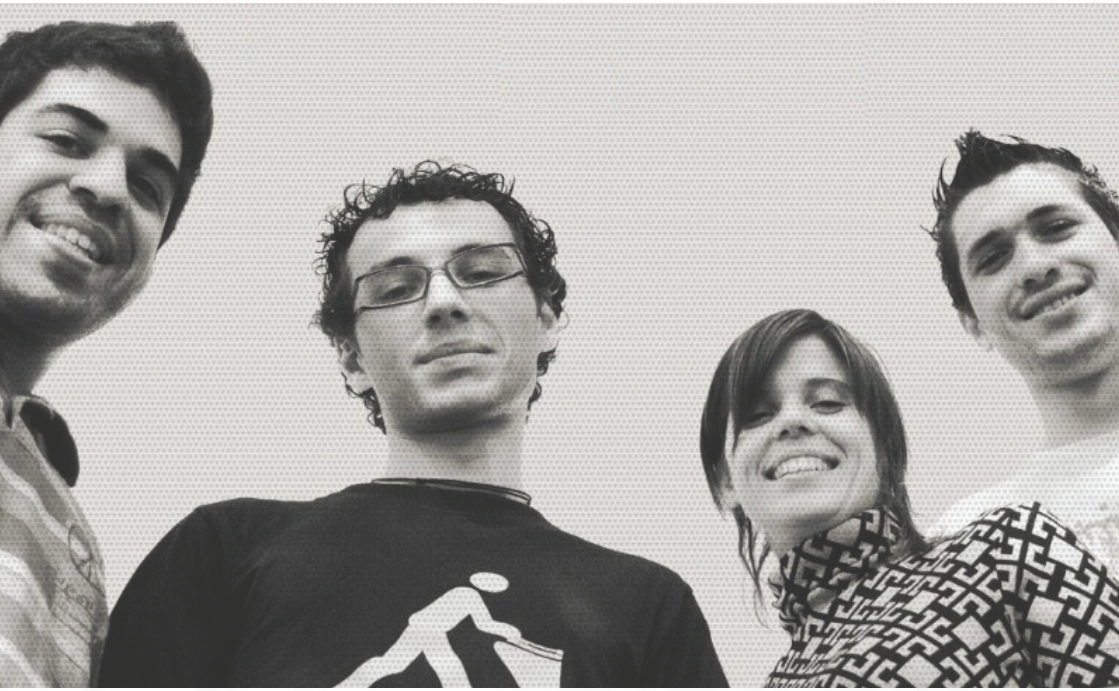
International Conference

The Higher Short Term.
The CET and the Future.



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Index

Introductory Note

As part of the activities of the Centre for Policy Research and Education Systems (CIPSE), the Polytechnic Institute of Leiria, in collaboration with the FOR.CET, organizational unit of the Institute which is responsible for the achievement of technological specialization courses (CET), held on in 2011, the International Conference “the Higher Short Term: the CET and the Future.”

The papers presented are gathered in this publication, available to the community of stakeholders in education and training, a set of texts from specialists and testimonials from entrepreneurs and graduates who can contribute to further reflection on the role of Technological Specialization Courses, as well as their contribution to the training and development of the country and its future in the context of similar training in EU countries.

The conference goal is shaped in this edition, whose intent is to contribute for the collection of information that allows a better understanding of the Portuguese experience in this area and a perspective for the future, including a possible evolution towards Short Cycle Higher Education (SCHE).

José Manuel Silva

THE PORTUGUESE CASE AND THE INTERNATIONAL EXPERIENCES

FINDINGS OF THE 2011 SURVEY: SHORT CYCLE HIGHER EDUCATION IN EUROPE – L5 THE MISSING LINK

Magda Kirsch

Since 2005 Short Cycle Higher Education[1] has been integrated into the Qualifications framework for the European Higher Education Area(QF-EHEA). In 2004 a Dublin descriptor was also developed for this short cycle within or linked to the first cycle of the European Higher Education Area framework. The 2011 study on "Short Cycle Higher Education in Europe- L5, the missing link"had as an objective to make a detailed analysis of existing Short Cycle Higher Education (SCHE) as an intermediate level of the first level of higher education or at level 5 of the European Qualifications Framework (EQF) in 32 of the Bologna signatory countries: the 27 member states of the European Union, the EFTA countries and Turkey. One of the specific objectives was to find out what changes had taken place in the short cycle higher education landscape since 2003 when the former EURASHE study on SCHE (Kirsch et al.) was made. Another objective was to see to what extent the development and implementation of SCHE is contributing to the implementation of the strategic framework for Education and Training 2020 (ET 2020) of the European Union and the objectives outlined in the Leuven Communiqué of 2010 after the meeting of the ministers of higher education. Overall, the comparative study attempts to highlight the major developments in SCHE over the past 7 years, focusing on similarities and differences across Europe.

Context of the study

At the moment Europe is being faced with 20% of unemployed young people most of them unskilled or low-skilled workers. At the same time national and European studies (CEDEFOP, 2010, Skills Supply and Demand in Europe) have demonstrated that the labour market needs highly skilled technicians and service workers and that in the future the need for highly skill technicians service workers will still grow. As a result a growing number of adult workers (have to) return to education to upgrade their skills in order to be up skilled. Moreover, although our knowledge society needs more graduates from higher education, many young people especially coming from a low socio-economic background are ill-prepared to access HE.

The European Commission with its strategic framework for European cooperation in education and training ('ET 2020') wants to make lifelong learning and mobility a reality, improve the quality and efficiency of education and training,

[1] Short Cycle Higher Education, SCHE.

promote equity, social cohesion and active citizenship and enhance creativity and innovation, including entrepreneurship. Also within the Bologna process there is a growing concern for the social dimension. In the Leuven Communiqué (Bologna Process: Leuven, 2010) the objectives were amongst others: equitable access and completion of HE striving for excellence in all aspects of higher education.

The study wanted to find out where SCHE had been introduced and whether SCHE could contribute to meeting the labour market needs and also to reaching the objectives of ET 2020 and of the Leuven Communiqué. It also wanted to find out if and how these objectives were being met.

Some of the key questions addressed in the study are: have more countries developed SCHE? Is SCHE always seen as an intermediate level within the first level of higher education? Is it always situated at level 5 of the EQF? What is the profile of the students and the lecturers in SCHE? What is the contribution of SCHE to lifelong learning? Is SCHE seen as a means of progression towards further degree studies? How are SCHE institutions cooperating with industry and other social partners? What about student and teacher mobility and internationalisation in SCHE? What about QA in SCHE? What about employability, multilingualism, active citizenship and social commitment in SCHE? The authors have tried to address these key questions in the present study.

Situation of SCHE in Europe

SCHE - level 5 studies are definitely gaining ground compared to the situation in 2003. At the moment 19 of the European countries (or regions) studied do have SCHE – level 5. A few of those countries have just started up SCHE - level 5 studies and others intend to do so in the near future. 1,694,080 students at least are studying in SCHE-programmes. Especially non-traditional and mature students are increasingly participating in SCHE. It must however be stressed that these figures have been contaminated by the numbers of Turkish students participating in SCHE. Not less than 900.000 of the SCHE students (approximately 30% of students in Turkish higher education) are indeed Turkish.

The Bologna process has made SCHE visible but there are still a number of problems concerning SCHE. Although in most countries studies at level 5 of the EQF are also SCHE and although they are considered to be compatible, this is not always the case. Indeed in some countries there are level 5 studies or training of a professional nature which are not considered to be SCHE as they are not an intermediate level within the first level of higher education. Especially German speaking countries where it is considered that level 5 studies do not comply with the logic of higher education. In yet other countries two parallel systems exist with on the one hand SCHE – level 5 studies (within HE) and on the other level 5 professional higher education which is not considered to be part of higher education. In Portugal we encounter a situation where level 5 courses, although mainly being delivered by Higher Education Institutions and giving the possibility of transferring some ECTS credits towards the Bachelor's degree are not recognized as higher education. All together qualifications at level 5 remain quite blurred in several countries. We are thus even going in some countries towards a new binary system at level 5 with on the one hand SCHE and on the other qualifications at level 5 that are mainly focusing the labour market. In all countries providing SCHE there is specific legislation either as part of HE legislation in general or as a separate legislation for SCHE level 5 studies.

In most cases SCHE level 5 is organised by the State and provided by various public education providers but in some cases it is organised by private providers. In both cases it may sometimes be organised in cooperation with sectoral or professional organisations, with chambers of commerce, with individual companies, with trade unions etc. In most countries SCHE level 5 is provided by various public education providers such as universities, university colleges, universities of applied sciences, regional technical institutes, further education or adult education organisations or even upper secondary schools. However, in the majority of countries it is either provided by higher education institutions or the institutions providing SCHE have strong structural links with higher education institutions. In all countries surveyed SCHE is subsidised by the State or other authorities. In some cases there may be some (indirect) funding by companies.

The fact that SCHE is provided in such a wide variety of settings enhances the opportunities of non-traditional learners to participate in higher education. However, it is also to be noted that although SCHE is offered in a wide variety of settings, HEI are very often the awarding or responsible organisation or body.

In most countries two progression routes

First of all, SCHE can be considered to be the missing link between secondary and higher education. The fact that the Bologna process has led to the introduction of the Qualifications Framework for the EHEA (including, within national contexts, the possibility of intermediate qualifications) has definitely enhanced the status of SCHE. SCHE enables students to climb the ladder of higher education step by step while at the same time offering them opportunities to find a job on the labour market.

In most countries the main objective of level 5 - SCHE studies is professional specialization focusing on employment. It must be stressed that SCHE level 5 studies always clearly lead to a vocational HE qualification; this means that every student who has obtained a SCHE level 5-certificate or diploma has a qualification that enables him or her to apply for a job at that level on the labour market.

However, in the majority of countries surveyed students can also use most of

the credits earned in SCHE to progress to degree courses. In some countries students can even use all the credits earned to progress to a bachelor's award. The minimum students can transfer is 30 ECTS. Sometimes the number of credits depends on the articulation between programmes.

Characteristics of SCHE-studies

Although the bulk of the study programmes offered in SCHE are in the area of business studies, administration, building, catering and hospitality, engineering and mechanics, it is interesting to point out that new programmes are being developed in areas such as logistics, ecology, forestry, security, entrepreneurship, wine sales, aquaculture, driving instructor, aircraft mechanics etc. This indicates that SCHE is a thriving sector which quickly responds to the needs and demands of industry. It is therefore not surprising that in most countries the employability rate of students is good and therefore SCHE could contribute to reducing youth unemployment.

In all countries SCHE level 5 HE has a very strong focus on cooperation with industry and other economic and social partners. In some cases cooperation with companies is compulsory. The key argument to do so is the need to have more highly educated and trained technicians that are required by industry and who respond to the explicit needs of industry. As SCHE studies try to respond swiftly to demands of industry and as SCHE studies are employment-oriented it is obvious that collaboration with industry and business in designing the programmes and curricula and in defining the learning outcomes is very strongly targeted. This collaboration with industry takes different forms: representatives of industry sit on management boards of institutions or in regional programme committees, they are involved in external QA panels or they sit on examination boards for final exams and last but not least industry offers placements or internships. Many lecturers in SCHE also have strong links with industry as the majority of institutions have representatives of industry teaching at their institution.

There is a genuine need for students with a SCHE diploma or certificate and most of them find a job fairly easily within a reasonable period after their studies. This study also reveals that students are employed at their level as highly skilled technicians in various kinds of jobs. The fact that SCHE focuses on immediate and concrete employment results in industry being closely involved in outlining the contents of level 5 SCHE studies. It also results in the fact that SCHE-courses put considerable emphasis on employability in various ways.

Employability is focused upon especially by stressing vocational competences, by taking industry needs into account while setting up programmes and drafting curricula, by regularly adapting curricula to the needs of industry, by using a modular approach, by placements or internships and by using innovative pedagogical methods (such as projects in cooperation with industry) etc. Employability is definitely also enhanced by the fact that in most countries SCHE institutions have a mixture of lecturers with an academic and a professional profile. In some countries legislation states that a certain percentage of lecturers have to have a professional profile appropriate to the professions for which training is provided. This also means that the teachers with a professional profile very often combine education with work in a company, which means they are very well aware of the latest developments in the profession concerned.

Although it is generally believed that multilingualism helps to enhance the employability of graduates the attention given to multilingualism in SCHE is minimal. Placements abroad and foreign guest lecturers are appreciated to promote multilingualism but a minority of SCHE institutions and ministries consider offering language courses to be useful. Multilingualism is definitely not an issue in English-speaking countries.

SCHE contributes to making lifelong learning a reality

It should be stressed that the development and the implementation of SCHE contributes greatly to making lifelong learning a reality. As has been demonstrated in the study, many of the students in SCHE are non-traditional and mature students who return to education at a later stage in life, thus enabling them to make lifelong learning a reality. An important number of these mature students combine work with education and training.

Although entry requirements in most countries are similar to those for other levels of higher education (a secondary school certificate) access requirements for SCHE programmes usually also provide more flexibility either through recognition of prior learning or through testing of adult or mature students.

Provision of SCHE is also quite flexible through part-time learning, dual learning and blended learning systems including ODL, time-tables meeting the needs of the learners etc. This proves that most countries see SCHE- level 5 in a lifelong learning perspective focusing on flexible access and flexible learning pathways. Notwithstanding the fact that many countries offer flexible learning pathways the majority of the students are still full-time students. However in a few countries the majority or a considerable percentage of students are part-time students. Those who study part-time are in most cases adult or mature students who may already be working. In those cases they combine work and learning.

SCHE is not only seen as an opportunity to widen access to higher education but also to stimulate their progress towards a bachelor's degree at a later stage. Legislative frameworks are provided in most countries to enable this. The credits students get recognized when pursuing their studies differ according to the country.

Active citizenship and social commitment is promoted by several institutions in various ways: by engaging students in local social projects, by teaching corporate social responsibility, by implementing a sustainable development policy or by collaborating with NGOs. However, only a small number of institutions have a diversity charter promoting the involvement of disadvantaged students.

As they very often offer technical and technological specializations, SCHE-institutions are open to new technologies and innovation. As shown in the list of recently introduced programmes it is clear many programmes are state-of the art and responding to new trends (e.g. green jobs) and new technologies. Moreover several institutions provide programmes that enhance entrepreneurship and many of them teach entrepreneurship as a subject.

Without any doubt, the fact that many lecturers are entrepreneurs themselves and that creative pedagogical methods are used (e.g. projects in companies) enhances creativity, innovation and entrepreneurship among the students.

It is quite remarkable that the majority of the countries that have SCHE still express the workload in years. Typically the programmes cover two-year full-time study. Only a few countries express the workload in ECTS credits ranging from 90 to 150 ECTS credits. Exceptions as to the length and the workload of programmes concern mainly nursing programmes. The Diploma Supplement is only generally used in 13 of the 20 countries that have SCHE. This is the case because they are legally obliged to do so. In a few cases they are invited to use it. The majority believe that the Diploma Supplement facilitates transition to degree studies or access to the labour market or internationalisation.

In the majority of countries having SCHE the curriculum is a mixture of theory, practice (within the HEI) and a work placement.

The titles, degrees, certificates or diplomas awarded are quite different in nature and in terminology. The great variety of terms used fails to enhance the transparency and readability or user friendliness of the awards granted.

SCHE contributes to widening access to and participation in higher education

Europe needs more highly educated and trained people and SCHE can make a major contribution to this. It should be highlighted very strongly that SCHE is a unique opportunity to attract more students (and especially students of a socially disadvantaged background). Although there are more women participating in SCHE, men seem to participate more in SCHE programmes than they do in other higher education programmes. Thus SCHE could contribute to reducing growing gender inequity in higher education.

SCHE is definitely contributing to widening participation in higher education and to enhancing social cohesion and equity as more disadvantaged students and more mature students are involved in SCHE. Although hardly any data are available, the majority of ministries and institutions think that compared to other levels of education there are more disadvantaged students in SCHE. The majority of respondent institutions providing SCHE even think that disadvantaged students are over-represented in SCHE. The lack of data as to underprivileged students shows that efforts still have to be made to improve and enhance data collection in certain areas. Finally the lack of information as to concrete diversity policies implemented within HEI in many countries also needs to be addressed.

SCHE contributes to the development of NQFs and to getting the EQF better known

The introduction of the QF-EHEA and the EQF have led to countries restructuring their higher education structure and in some countries this has led to the introduction of SCHE and in others to upgrading vocational programmes in higher education to bachelor programmes.

Most, if not all, of the countries concerned, are reflecting on level 5 of the EQF while implementing their National Qualifications Framework (NQF). In some cases they are wondering how to fill in level 5 of the EQF in their NQF. We might say that thus SCHE is contributing to developing the NQF and getting the EQF better known.
Virtually all countries have developed or are developing their NQF but the referencing in most cases has not yet been finalized. This results in some countries still not having decided where to position certain professional higher education / training courses. In some cases it is still undecided whether to put these studies at level 5 or level 6 of the EQF. In other cases it is not yet clear whether some post-secondary vocational programmes should be considered as level 4 or level 5 SCHE programmes. Moreover, some countries that do not organise SCHE at the moment yet might do so in the near future. This means that the present report can only be seen as a state of affairs at the end of 2010 and that the situation might change considerably in the near future.

SCHE makes mobility and internationalisation a limited reality

The majority of SCHE institutions stress that SCHE lecturers and students participate in various mobility programmes such as Erasmus, Leonardo, Comenius, Grundtvig or regional programmes (e.g. Nordplus for Scandinavian countries). SCHE students participate mainly in the Erasmus and Leonardo mobility but have difficulties to do so, mainly as the SCHE studies are short which makes it difficult to integrate mobility periods into the programmes.

Mobility tools such as the learning agreement and the transcript of records

under Erasmus and the training agreement under Leonardo are used by an important number of SCHE institutions but more information is still needed to have them more widely used. Europass mobility documents are only used by a small group as most SCHE lecturers and students are involved in Erasmus mobility.

SCHE institutions are mainly involved in Erasmus and Leonardo projects. Some are involved in Comenius and some adult education or further education institutions organising SCHE are involved in Grundtvig projects. An important group of SCHE institutions is still involved in no cooperation at all. This is very often due to the fact that they are small and have little time and HR to invest in internationalisation. The staff also lacks language skills and sometimes motivation to get involved. SCHE students from a disadvantaged background have no or little financial means to get involved. Working students can also not participate in long-term mobility.

SCHE contributes to improving the quality and efficiency of education and training

Half of the respondent SCHE institutions carry out internal quality assurance (self-) evaluations and mostly because they are obliged to do so. Furthermore in all countries (except one) there is always some kind of external quality assurance. However in several countries it is still the case that the external quality assurance agencies are yet to be the independent agencies as defined by ENQA.

Most of the countries have accreditation but in three of those the accreditation is ex ante which means the SCHE programmes have to be accredited before being introduced. Also here accreditation is not always carried out by independent agencies. Although already a lot of efforts are being made this is an area where there is still room for improvement especially as far as internal quality assurance and independent bodies for external quality assurance and accreditation are concerned.

SCHE is contributing to efficiency in higher education as it may help reduce drop-out rates of students at other levels of higher education as in most countries there is articulation between secondary VET-courses and SCHE.

SCHE contributes to reaching the objectives of the 2020 ET strategy and of the Leuven Communiqué

For all the reasons given above it can be stated that SCHE contributes to reaching most of the objectives of the 2020 ET strategy and of the Leuven Communiqué 'Learning for the future: higher education priorities for the decade to come'.

Bibliography

Bologna Process: Berlin. (2003). Realizing the European Higher Education Area. Retrieved from http://www.bologna-bergen2005.no/Docs/00-Main_doc/030919Berlin_Communique.PDF

Bologna Joint Quality Initiative. (2004). Shared 'Dublin' descriptors for Short Cycle, First Cycle, Second Cycle and Third Cycle awards. Retrieved from http://www.uni-due.de/imperia/md/content/bologna/dublin_descriptors.pdf

Bologna Process: Bergen. (2005). The European Higher Education Area - Achieving the Goals. Retrieved from: http://www.bologna-bergen2005.no/Docs/00-Main_doc/050520_Bergen_Communique.pdf

Bologna Process: Leuven and Louvain-la-Neuve. (2009). The Bologna Process 2020 - The European Higher Education Area in the new decade. Retrieved from http://www.ond.vlaanderen.be/hogeronderwijs/bologna/conference/documents/Leuven_Louvain-la-Neuve_Communiqu%C3%A9_April_2009.pdf

CCISP (2010). Documents 2010. http://www.ccisp.pt/Documentos/Estudos%20e%20Estatisticas/Document%20about%20portuguese%20higher%20education.pdf

CEDEFOP (2010). The development of national qualifications frameworks in Europe. Retrieved from http://www.cedefop.europa.eu/EN/publications/16666.aspx

CEDEFOP (2010). Skills Supply and Demand in Europe. Medium-term forecast up to 2020. Retrieved from: http://www.cedefop.europa.eu/EN/Files/3052_en.pdf

European Association for Quality Assurance in Higher Education (2009). ENQA Report on Standards and Guidelines for Quality Assurance in the European Higher Education Area. Helsinki: ENQA. Retrieved from: http://www.enqa.eu/files/ESG_3edition%20%282%29.pdf

European Commission (2009). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Progress towards the Lisbon Objectives In Education and Training; Analysis of implementation at the European and national levels, COM(2009) 640. Brussels/ European Commission. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2009:1598:FIN:EN:PDF

European Commission (2010), 'New Skills for New Jobs: Action now, A report by the Expert Group on New Skills for New Jobs prepared for the European Commission, Luxembourg: EU publications office. Retrieved from: ec.europa.eu/social/BlobServlet?docId=4508&langId=en

European Commission (2010). Education and training. The European Qualifications Framework (EQF). Retrieved in October 2010 from: http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm#doc

European Commission (2008). Explaining the European Qualifications Framework for Lifelong Learning http://62.77.61.20/asp/RAP/RAP_SendAllegato.asp?Id=18

European Commission. 2010. Eurostat. Unemployment Statistics. Retrieved in October 2010 from: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Unemployment_statistics

Kirsch, M., Beernaert, Y. & Norgaard, S. (2003). Tertiary short cycle education in Europe. A comparative study. Brussels: EURASHE.

Kirsch, M., Beernaert, Y. (2011). Short cycle higher education in Europe. Level 5: the missing link. Brussels: EURASHE.

Ministry of Science, Technology and Higher Education, Portugal (2010). A new landscape for Science, Technology and Tertiary Education in Portugal. http://www.dges.mctes.pt/NR/rdonlyres/90DBE647-5CB6-4846-B88F-101180D9E425/4832/New_landscapes_v18Jun20102.pdf

Ministry of Science, Technology and Higher Education, Portugal (2010). The framework for higher education qualifications in Portugal. MCTS. http://www.dges.mctes.pt/NR/rdonlyres/90DBE647-5CB6-4846-B88F-101180D9E425/4933/FHEQPortugal_22Nov_2010.pdf

SHORT CYCLES IN HIGHER EDUCATION

Sylvie Bonichon

A bit of history

Short Cycle Higher Education[1] in France has been part of the educational landscape for long. Indeed, the first SCHE programmes were created in the 1960s in order to meet the companies needs and expectations by providing students with higher vocational, technical or technological skills.

The first programmes to be implemented in the early 1960s prepared students to a BTS (Brevet de Technicien Supérieur) a Higher Technician Qualification. At that period, there were already programmes at the level of vocational secondary education, leading to a professional certificate and to a technician certificate. This is logically then, that the BTS programmes were implemented in secondary schools (Lycées) where the specific know-how and the necessary equipment were.

In the mid 1960s, IUTs (Instituts Universitaires de Technologie), University Institutes of Technology, were set up by universities to prepare students to a DUT, a University Diploma of Technology. The objective was to respond to demands from the industries that needed technicians with high technological skills to second and assist engineers.

Both systems have been co-existing and considered as Higher Education since then, closely linked to the world of work. BTS and DUT are national diplomas.

Today's situation

There are two here are two main providers for SCHE in France

1. Higher Education Sections in Lycées (upper secondary schools) propose BTS programmes that count 87 specialities in the fields of services, production and agriculture. About 230,000 students are registered in BTS in academic year 2010/2011.
2. University Institutes of Technology propose DUT programmes that count 24 specialities mainly in the domain of production but also in services. About 117,000 students are registered in DUT in academic year 2010/2011.

Surveys show that after graduation, BTS students will be more employed in SMEs while DUT students will mainly work in the industry and in big companies. Apart from these two main providers, a number of schools of Chambers of Commerce and Industry also propose BTS programmes. Furthermore, institutions in the domain of

[1] Short Cycle Higher Education - SCHE

Arts have other SCHE programmes leading to DMA (Diplômes des Métiers de l'Art), Diplomas of Art professions.

Format

Whatever the provider and the diploma prepared, SCHE in France are 2-year programmes awarding120 ECTS (European Credits). They are vocational, professional and technological oriented.

Programmes are composed of academic and professional/technological subjects for an average of 30 contact hours per week, plus 12 to 16 weeks (or more) in-company work experience.

Applied research is mainly included in IUT programmes.

For both BTS and DUT programmes, admission is very selective. Selection is made on transcript of records and motivation.

In France, they are more than 20% of the total number of Higher Education students studying in SCHE programmes.

Learning paths

Different learning paths are offered to students who can choose among the following:
- Full time education is mainly chosen by students who have just finished secondary school
- Apprenticeship or blended/dual education means that a student will spend one week (or part of a week) studying at school and one week (or part of the week) training in a company. This path is becoming more and more popular in France not only among students who can gain professional experience and receive a salary from the company, but also among companies who can train future staff and, in counterpart, get advantage of less costly skilled and innovative labour force for two years.
- Continuing education is for students who already have a job and want to get a higher qualification by taking evening courses or by taking advantage of their right to get paid leaves for it, as written in the French legislation.
- Distant learning is for all those who can't go and study in an institution for any reasons. They still have to have the traineeship period in a company to complete their degree.
- Prior Learning Recognition is the possibility for an experienced adult to get part or the whole of a diploma by having his/her previous formal, informal or non-formal learning recognized, as it is ruled by the French law.

After graduating

BTS and DUT are thus end-of-education diplomas and their first purpose is to enable students to get access to the labour market. However, after graduating, students can also further their studies and get direct admission to prepare a 'Licence professionnelle', the French name for professional Bachelor, or any equivalent qualification, level 6 of the European Qualification Framework.

According to national figures, about 30% of students graduated with a BTS want to further studies, while nearly 85% of students graduated with a DUT go for a Bachelor degree.

Implementation of SCHE programmes

As already mentioned, SCHE programmes have been created to answer employers' demands for higher skilled technicians, and thus to respond to the needs of the labour market and the national economy. The world of work is therefore an important stakeholder in the whole implementation process.

French BTS and DUT are ruled and regulated at a national level, which makes it a very centralised system.

At a national level
National pedagogical and professional commissions evaluate the needs for the creation of a programme and decide on the terms of reference. Representatives of the world of work also participate in the content of the curricula

At a regional level
Regional commissions with local representatives of the ministry of education and the world of work examine the relevance of implementing a programme in their area

At the institutional level
Local implementation is made in respect of the Terms of reference (Curriculum/HR/ Equipment/ Students Recruitment...). Representatives of the world of work are also involved and committed at this level: they are members of examination board, they provide institutions with equipment, they also act as external lecturers....

Quality Assurance

As to the relevance and the contents at national/regional levels:
Regular evaluations are carried out and remediation is proposed. It may lead to reforms, renovations, modernisation, or even to the termination of programmes.

As to the local/institutional level:
QA approach will vary according to the specificity of the educational providers

NQF/EQF

The French National Qualification Framework for LLL is composed of 5 levels: SCHE programmes are level 3 (level 2 is for Bachelor degrees or equivalent, level 4 is for end-of-secondary education).

In the European Qualification Framework, and in accordance with the Dublin descriptors for short cycles within the 1st cylce, French SCHE is level 5.

Economic and social dimension

Largely appreciated by employers, SCHE offers higher skilled technicians, able to adapt to changing situations and different contexts. It is also renowned for the rapid efficiency of the newly graduates in the workplace.

A study conducted in 2010 shows that durable employment rate after graduation reaches 86% for SCHE students graduated in 2007 (*Study 2010, Génération 2007 -Céreq, Centre d'études et de Recherche sur les qualifications*).

SCHE mainly attracts students who are aware of the importance of getting a HE qualification but who are not willing to study for a longer period, or who sees SCHE as a step towards further studies that they will be able to undertake right after their two-year programme, or in a later future. The recognition of SCHE programmes by companies in France and the good employability also reinforce this attractiveness.

Furthermore, even if students registered in SCHE come from different family contexts, a large number of them have families with a lower or medium social status background. It is seen then as an opportunity to get access to Higher Education.

Another factor that favors access to and interest for SCHE is the geographic proximity of the institutions/schools providing such programmes. When students can stay at their parents home, it makes education less costly so more accessible.

Last but not least, SCHE offers to anyone a chance to climb the ladder of qualifications step by step. In that aspect it has a real relevance for Lifelong Learning and Prior Learning Recognition, that are very ruled and regulated in France to enable individuals to get higher certificates and degrees. Figures show that French SCHE diplomas are among the most targeted Higher Education diplomas via LLL and PLR processes.

French SCHE in the Bologna Process

As in other countries in Europe, Schort Cycles programmes (EQF L5) in France are integrated within the first cycle of the national Higher Education framework (and in accordance with Dublin descriptors).

They have been granted 120 ECTS by decrees since 2005 (for DUT… and 2007 (for BTS).

Curricula are based on the competences approach and learning outcomes.

As already mentioned, French SCHE is an opportunity to attract more students in Higher Education and also gives an access to a higher level for adult learners in the frame of LLL and RPL, leading to an increase of higher qualified population at the national and, as a consequence, at a European level.

French SCHE highly participate in EU mobility programmes. They are eligible for Erasmus and take advantage of it mainly for traineeship/internship periods in Europe. Some students however, with a greater number of IUT students, go abroad for studying as well.

Outside Europe, there are also strong partnerships with CEGEP (Québec, Ca) and Community Colleges (USA)...

Annexes

Short Cycles in the European Higher Education Area and in the Bologna Process
2 important communiqués: Berlin 2003 and Bergen 2005

Dublin descriptors: Formulating a higher education short cycle (within the first cycle) descriptor...
A range of higher education awards are available to students who have undertaken a programme of study within the Bologna first cycle, but which do not represent the full extent of this cycle.

Such awards may prepare the student for employment, while also providing preparation for, and access to, studies to completion of the first cycle. These awards are referred to as higher education short cycle (within the first cycle)National systems may have various qualifications within the first cycle.

This descriptor is intended for a commonly found type, which approximates to 120 ECTS credits or equivalent.

Qualifications that signify completion of the higher education short cycle (within the first cycle) are awarded to students who:

- Have demonstrated knowledge and understanding in a field of study that builds upon general secondary education and is typically at a level supported by advanced textbooks; such knowledge provides an underpinning for a field of work or vocation, personal development, and further studies to complete the first cycle;
- Can apply their knowledge and understanding in occupational contexts;
- Have the ability to identify and use data to formulate responses to well-defined concrete and abstract problems;
- Can communicate about their understanding, skills and activities, with peers, supervisors and clients;
- Have the learning skills to undertake further studies with some autonomy.

FREE COMMUNICATIONS

DYNAMICS TO OPERATIONAL KNOWLEDGE AND THE SCIENTIFIC KNOWLEDGE: The Experience Project ELAGE under the Emergency Logistics Course

Daniel Neves

Summary

We all have characteristics that differ from each other, we are the result of influences received throughout our existence. We are beings capable of creating, producing and assimilate ideas. We have innate and acquired qualities, which give us the power to excel behind those who weren't able to develop.

The Competence makes the person and this one makes the organization. Competence can be defined as a set of knowledge (to know), skills (know /to do) and attitudes (know / to be) which, when integrated and used strategically, allows achieving successful results that are expected of in the organization. Thus, the competences are the result of learning and skills are associated with the practice, and they are only recognized after of being exercised, it's not enough just having knowledge, it is necessary to exercise it in order to consolidate and achieve it.

In this context, the fact of being aware that there is a fruitful path to follow in planning at the level of security and civil protection at several levels and difficulties in managing emergencies through ignorance or even the under information is distributed to various locations (demographics, equipment or housing to evacuate and where the affected citizens should be evacuated, among others) are systematically problems posed to Civil Protection Agents.

The purpose of the SLSEM project is to provide the municipality of Rio Maior a tactical and operational tool as a complement to the Municipal Emergency Plan for Civil Protection, able to assist the management of emergencies associated to different events, always thought as a view of responding to the operational needs of that moment, who in any field often have to take responsibility for the response.

SLSEM Project is based on a detailed work of elements inventory (means and resources), and elements that are dangerous and to its incorporation is a single database with reading on GIS - Geographic Information Systems. So, more than giving embody to the various legislation recently introduced in the System of Civil protection in Portugal, it should be assumed as a valuable business tool to support coordination and management of protection and rescue operations.

Keywords
Competence, Knowledge, Emergency Logistics, Dangers, Efficiency, Means and Resources.

Education and Training in Portugal

Despite the significant progress in the fields of Education and Training since the Restructuring of Democracy in 1974 to the present, it appears that the Portuguese population continues to present significant delays at the educational level compared to other countries.

The qualification of the workforce is low, secondary education has historically shown few vocational exits, being overwhelmingly oriented towards further study. There is a clear mismatching between the labor market needs and the demanding of higher education, which results in a high unemployment rate among the holders of some university courses.

In the last decades we have seen profound social economic and policies changes, and on a global scale. The globalization of the economy and markets, the spread of information technology and communication, the progressive transformation of traditional production systems, the emergence of global enterprises and multi-cultural, knowledge-based organizations and new alliances between countries, the emergence and growing importance of services sector are, among others, aspects that contributed to those changes.

In addition to this reality, the decline in birth rates and increasing life expectancy of populations in developed countries with an aging population, unemployment, the disappearance of the concept of employment for life, the increasing mobility of people migration and new, that make the challenges facing people today are very different.

Given the rapid social, economic, technological and organizational changes that we see, educational issues have assumed a central role, either for people or for organizations and countries. Education and training are no longer a “capital” that accumulated or acquired before entering the labor market, usually in early life adult and following an educational process sequential and chained, to become something that accompanies people throughout their lives, in particular, professional, could result in formal settings, non-formal or informal.

In addition to this reality, the decline in birth rates and the increasing of populations life expectancy in developed countries with the population consequent aging, unemployment, the disappearance of the concept of employment for life, the increasing mobility of people and the new migration phenomenon, contributes for a new vision of challenges that people are facing today are very different from past times. Due to the rapid social, economic, technological and organizational changes that we have been assisting to, educational issues have assumed a central role, either for people, organizations or even countries.

Education and training are no longer a “capital” that accumulated or acquired before entering in the labor market, usually in the early adult life and in the sequential of a following and chained educational process, to become something that accompanies people throughout their lives, in particular, professional, could result in formal settings, non-formal or informal. They are also having an increasing importance in the access and maintenance of workplace and in the improving of people’s life conditions.

The companies and their systems of education and training are thus faced with new needs and challenges, for which answers must be found to enable people to maintain their levels of well-being and employability. The Lifelong Learning (LLL), where the CET are also assuming a central role in policies and programs, either of EU or of the Portuguese state.

Framework for Technological Specialisation Courses

The CET is a specialized technical training of post-secondary non superior nature not which aims a preparation of young and adults for the performance of skilled occupations. They are characterized by having a strong practical component, either in class or in a real work situation. Its successful completion provides a level 4 qualification and allows them to pursue studies in higher education.

Despite the CET teaching has started in the 90s of last century, only in 2006 through the publication of Decree-Law No. 88/2006 of May 23rd, this type of courses are regulated in close coordination with the Law 49/2005 of August 30 - Law of the Education (Education Act), in particular as it regards access conditions to further education or in the case of CET promoted by public higher education institutions, rules financing. These changes allowed the significantly increasing the range of individuals who can apply to CET and constituted an incentive for the involvement of public institutions of higher learning in this type of training, verifyng a marked growth in terms of demand and supply of CET.

In this context, it should be noted that the training plan of the CET is organized in three training components:

- General Education and Science Component - aims to “develop appropriate attitudes and behaviors to professionals with high level of professional qualification and adaptability to the company and world work, improving where this is indispensable, knowledge of areas of scientific underpinning which proves the technologies of the training area “
- Training Technology Component - integrates training units of “oriented-nature technology to the understanding of practical activities and for the resolution of problems within the scope of professional practice.”
- Training Work Context Component - application of “knowledge and the skills acquired to the practical activities of their professional profile and implementation of activities under the guidance, using the techniques, equipment and materials that integrate the processes of production of goods or services”.

They are characterized by having a strong practical component, either in class or in a real work situation. Indeed, the levels of failure and early school leaving and unqualified are enormous, causing many young people entering in the labor market with no qualifications and often without the minimum level of education.

The Logistics Emergency CET

The CET Emergency Logistics is part of the training area of Protection of People and Goods, and aims to train technical professionals who independently or under supervision, analyze and perform field operations support for emergency situations such as accidents, disasters and calamities, in order to optimize resources and maneuvers in the "theater of operations."

The training plan of the CET-Emergency Logistics consists of 14 training units that correspond to 1010 teaching hours and 525 hours of training in work context (Scheme 1).

COMPONENT GENERAL AND SCIENTIFIC

Training Unit	Hours	ECTS
Communication Skills	30	1,5
Technical English	30	1,5
Human Resource Management	45	3
Conflict Management	48	3

TECHNOLOGICAL COMPONENT

Training Unit	Hours	ECTS
Logistics Principles	33	2
Replenishment Logistics Function	70	5
Transportation Logistics Function	50	4
Maintenance Logistics Function	28	1
Logistics Function Evac. and Hospitalization	60	4
Emergency Logistics Planning	70	5
Logistics Study Situation	70	5
Topography	75	4
Project Logistics Emergency	395	20
Study Visit	16	1

ON THE JOB TRAINING

Training Unit	Hours	ECTS
On the Job Training	525	30

Scheme 1. Plan of Organization Studies

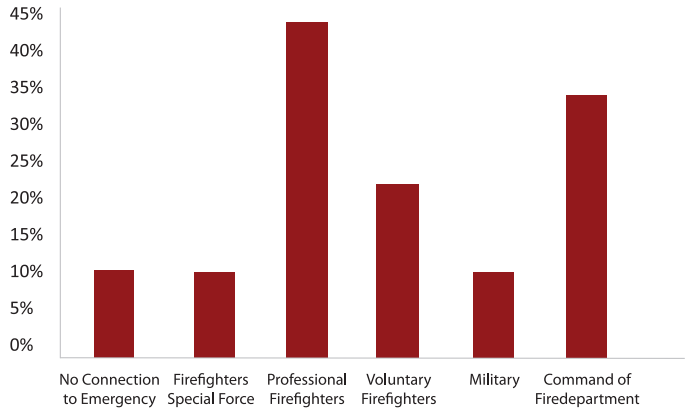
The course provides the following skills: Understanding the importance of logistics and the rationalization of means and resources in a context of "operations theater"; Planning, organizing, preparing and acting in different intervention contexts; Mastering the principles and operating procedures related to refueling, transportation, maintenance, evacuation and hospitalization; Applying the principles of people and goods security .

In order to respond to all requests as efficiently as possible, the logistics has to put into practice a variety of specialized tasks and human resources and logistics surrounding structures in the Logistics maneuver in order to expedite the planning, control, performance and accuracy through a set of activities that work all together for the same purpose.

Operational Knowledge vs. Scientific Knowledge

Training Unit - Project Logistics Emergency

As part of the training units - Emergency Project in Logistics and Study Tour of the Emergency Logistics CET with a workload of around 40.3% of the inherent scientific and technological components, depending on the tactical and operational knowledge of most students mostly linked to positions of leadership and command of fire departments (as Figure 1), the teaching body expedited procedures related to programmatic contents in order to enhance and strengthen scientific content to foster a critical and constructive sense for the definition of strategies and tactical situations inherent to emergency management procedures.



Graphic 1. Connection of Vocational Trainees

It was then perspectivated that the learning results associated to Emergency Logistics Project gathers the operational knowledge acquired by these professionals through life with a scientific top-level knowledge to support the decision making based on the conceptualized logistics doctrine and materialized in the operations management in diverse scenarios, based on the rationalization of means and resources (time, right place, adequate amounts and best conditions of efficiency).

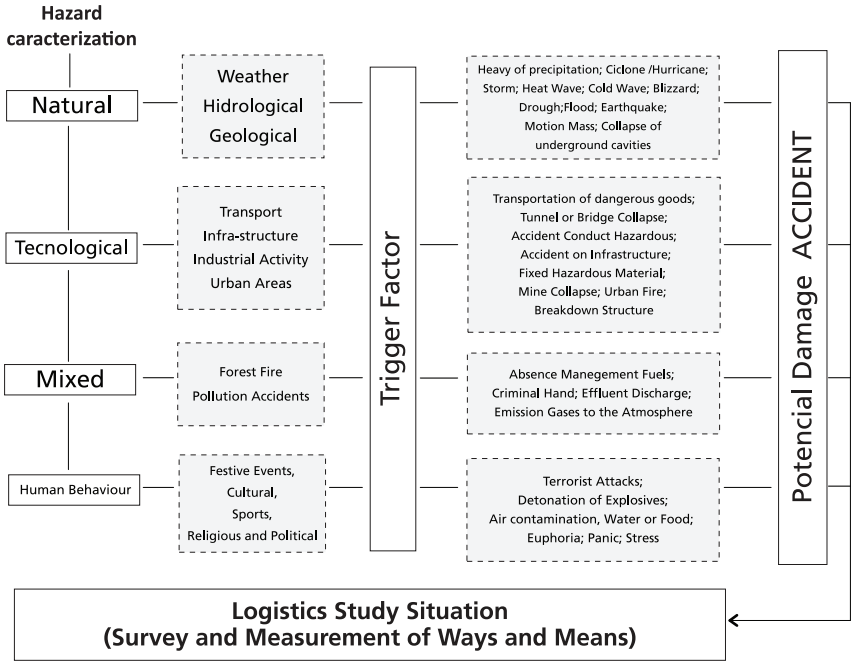
In this context, students acquired knowledge which allows them to use the appropriate tools and software for solving practical problems of planning and project management; they learned to master the concepts, methodologies and techniques in emergency logistics planning, to manage in concerted way Civil Protection Events; to optimize means and civil protection resources, using tools and applications systems with foresight, planning and emergency response; to simulate severe accidents, catastrophes or calamities previewing the principles in emergency logistics, Planning actions to protect and rescue situations for a better impact. It should be noted learning outcomes has been diagnosed by making SLSEM Project - Study Logistics Support Emergency Management.

The Logistics Emergency allows doing the analysis to emergency operations, such as major accidents and catastrophes, with the aim of optimizing resources and the time of intervention, thereby improving the efficiency conditions.

SLSEM Project

Project SLSEM initiative arises from the trainers and trainees initiative of the CET of Logistics Emergency unit promoted by FORCET - IPL facilities in the Professional School of Rio Maior. It should be noted that this class project's main objective was to highlight the theoretical and practical knowledge acquired during the training units of the general component, science and technology. Rather than put into practice the knowledge, the working group intended to contribute to the development of a database for the municipality of Rio Maior, supporting the concept of "Logistics Emergency" which has been proved as vital in the protection operations and rescue, which we, future technicians in the field of civil protection, attach high value in the juncture of the strategy and tactical operations.

Operational Skills versus Scientific Knowledege, Training Unit – Emergency Logistics Project. It was a study object the land area allocated to the municipality of Rio Maior, being its special focus on lifting hazards, means and resources (local and adjacent municipalities). The platform consists of a database that incorporates all the components that represent the dangers and respective parts exposed, inventory and georeferencing of means and resources.Its development allowed defining the support capacity of an emergency response by cross-referencing data and inherently scenarios simulation based on the Microsoft Access and Geographic Information Systems - ArcGIS 9.3 powerful tools. This set practical work mostly focused on the research literature (books, technical information, legislation, news) for the physical, climatic, demographic, and field surveys (topography, historical events, people and other information) and inventory means and resources that contribute to the protection and rescue operations.



Graphic 2 . Project Organization SLSEM

The Experience Project SLSEM

The difficulties observed in the management of emergency situations were mainly through ignorance of the ground reality, or even by information virtue (such as demographics, community facilities to evacuate - educational, social - or even where should the affected citizens be evacuated from, among others), or even the information is distributed in various locations, are daily problems posed to civil protection services.A review of emergency plans and the incorporation of new data is a pre-requirement to the necessary redefinition of strategies and forms of management risk as well as adaptation to local area and the establishment of partnerships. , general or special, of municipal area, district, regional or even national. The presented project assumes a Geographic Information System (GIS), in which may or may not

The awareness on the part of different makers, that an emergency plan must be dynamic and flexible led us to the presentation of the SLSEM project created having as basis the national technical standards and criteria established for the preparation of emergency plans of civil protection, general or special, of municipal area, district, regional or even national. The presented project assumes a Geographic Information System (GIS), in which may or may not be associated with other cards and projects for territorial analysis (Fig. 2) and from which are connected to a different set of databases that integrate different associated thematic areas with various aspects related to safety.

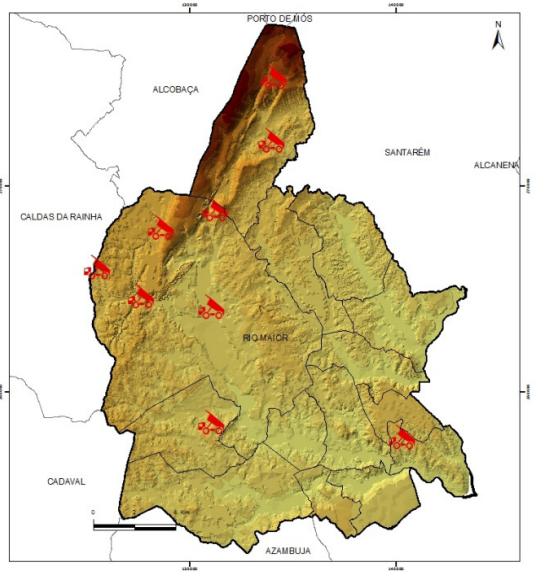


Figure 2 . Geolocation Ways and Means

The first objective in the construction of the platform has to do essentially with the development of a tool capable of providing agents makers in the field of Civil Protection the ability to perform their legal duties, allowing a multi-scale action, according to the emergency degree, taking to the optimization of the various means and resources of a given territory.The platform even allows different uses in logic with complementary perspectives. On the other hand, allowing both the identification of vulnerabilities and the subsequent taking of decisions which aim the progressive reduction and minimizing the effects if the risk such as optimizing its management, when it is actually taking place.

Thus, the system is a powerful tool that is accepted as essential, not only in supporting the management of emergency rescue situations, like, it plays a determinant role in the exercise of planning, identifying and promoting the development of integrated systems at the protection industry.

In addition to the significant focus on forest fires, other dangers were, likewise, considered, such as floods, rupture of structures, accidents with hazardous materials, among others. The platform building wasn't in a tight manner, enables easily updating various hazards, both directly the mapping, as also for changing databases, something that is reflected immediately in the graphical representation.

The implementation of a system / platform capable of supporting the entire structure of civil protection in providing at real time the possibility of managing different events of natural and anthropogenic risks, it constitutes, since long time ago as a project which, while ambitious, was assumed to be a mainstay for the management of any emergency and rescue event.

Rather than give "body" to a legal formality, the methodology of SLSEM intends to be presented as a working instrument per excellence, not only in the daily management of available means and resources, but also in the planning process and planning equipment response to emergency situations and rescue functioning as a main key for any emergency plan and civil protection.

The SLSEM project developed for municipalities in nature, whether in nature, provides moreover, the automation of a set of processes that were previously based on paper documents, which often became difficult to read and interconnect, thus creating conditions for analysis and decisions in short periods of time as well as enabling a continuous process.It should be noted that the public presentation raised the curiosity of many public and local businesses, regional and national by its inherent character in innovative decision support systems for safety and civil protection.

Among the 156 participants in the presentation of the project includes the presence of representatives of the Civil Government, Mayors, the National Authority for Civil Protection Authority for Work, District and Municipal Operational Commanders, Officers and Commanders of Representatives of the Fire Brigades Security Forces, Representative of the National Institute of Emergency Medicine; Elements of Crisis Management Office at Lisbon Airport, National School of Firefighters, National Association of Professional Firefighters and investigators and students.

The Testimony of Training in Work Context

Once authorized by ANPC training in a real work environment at the Center for Protection and Rescue Operations of Santarém, was granted to the student the opportunity to integrate the Logistics Cell Device Operation Fatima in 2010, which played the same role functions of Deputy Commander for Logistics, the commander of operations by assisting in his job tasks.According to the trainee "It was an experience of great value both in academia, professionally and personally levels.

The Pilgrimage to Fatima 12 and 13 May, coinciding with the official visit of His Holiness and Apostolic Pope, characterized by walking directions from a large

number of believers from all over the country, led to a significant increase of pilgrims to the city of Fatima and, particularly, the area of the Sanctuary.

With the long walking to Fatima people arrived in impaired physical and psychological conditions, requiring health and social support and monitoring throughout the period of the ceremonies. Due to various factors such as sun exposure, low night temperatures, the high average level of age, poor nutrition and no-fluid, as well as fatigue and lack of conditions for a good rest, has increased the level of danger and risks.

In order to guarantee a good efficiency of ground forces linked to "safety" for the first time, it has been created a logistics cell that coordinated all the logistical support to forces in the theater. This cell based in CETAC Logistics Center (Tactical Command), equipped with computer facilities, audiovisual and communications, worked through two distinct teams alternating turns. . It had under its control the Support logistical support and ZCR (concentration and Reserve Area) and it had under its responsibility the refueling and sanitary material

The balance of this training period in a real work environment is extremely positive: From it I took His essential teachings to the performance of the Technical Emergency Logistics. The traineeship took place in the best possible way and was received with much appreciation and consideration by the entity, which for me is the best at a District level in relation to the District Civil Protection Area.

During the traineeship period I was assigned of different tasks, all of great responsibility, which demonstrate the confidence placed on me, which I complied with remarkable merit. Please note, the participation and developed activity as an integral member of the Logistics Cell Operation Fatima 2010.

We can say that the logistics used for this operation has not already been the ideal, but there was a great evolutionary step leaving behind the paradigm of "let's go back to the logistics," where we mean "go to food.

I am convinced that my participation in Operation Fatima in 2010, due to the relevant authorities who have visited the Logistics Cell, was the seed launching of the introduction of "our" Logistics in the Context of Emergency "and opening a door for these future Emergency logisticians who now form the present CET.

Concluding Remarks

The Logistics Emergency CET is a valid alternative to the continuation of studies in the field of protection of people and property and brings a useful intermediate level of skills and necessary to define the tactical situation in accident scenarios, as well as in the current management of protection and rescue operations. The CET is a very suitable way for the returning of people who are in active life to the education and training system, particularly when there is a direct relationship between the CET and professional activity, providing an opportunity to update and acquire new knowledge and skills in their professional area, in a perspective of lifelong learning.

The culmination of the Logistics Emergency CET which was helded in the City of Rio Maior, was expressed with the materialization and public presentation of the SLSEM project, which shows a high level of technical training, since the students have revealed the importance of training to update and acquire skills, particularly at the level of know-how and ability to solve problems of strategic order and inherent tactical to the new paradigm of civil protection in Portugal. It should be noted that this course is suited to the Civil Protection Agents and Entities needs with special duty of cooperating in the protection and rescue areas, with a special focus on the practical component and application (field work, exercises, simulations and participation in Task Force - an example of "Operation Fatima 2010" sponsored by the National Civil Protection), providing adequate preparation for the exercise of qualified emerging professions.

Depending on the characteristic education level of the human resources linked to the rescue in Portugal, the CET is a strong contribution to the return to education and training system for those who are in active life, and therefore to pursuit of higher studies in an area that more and more ordinary citizen demands more readily, quality and efficiency. The experience that I've acquired in managing the training process of technical and scientific character as well as the positive feedback from students and organizations are finding that the CET is a high-level technical training, which ensures a qualification with knowledge and developing high technical skills, allowing to the graduates to assume responsibilities independently of design, direction and management activities in the field of Civil Protection.

Bibliography

ALEXANDER, D. (2002) – Principles of emergency planning and management, Oxford University Press, New York.ALMEIDA, A. N. & Vieira, M. M. (2006, Outubro). A escola em Portugal. Lisboa: Imprensa de Ciências Sociais.

ANPC - Unidade de Planeamento/Núcleo de Planeamento de Emergência (2009) – "Guia para a Caracterização de Risco no Âmbito da Elaboração de Planos de Emergência de Protecção Civil", Cadernos Técnicos PROCIV, número 9.

ANPC - Unidade de Planeamento/Núcleo de Planeamento de Emergência 2009) – "Manual de apoio à elaboração e operacionalização de Planos de Emergência de Protecção Civil", Cadernos Técnicos PROCIV, número 3.

ASCENSÃO, P. & Abegão, J. (1998, Abril/Junho). Escolas Tecnológicas: ninguém aprende a nadar fora de água. FORMAR.

AYALA, Carcedo, F. J. (2002) – "Introducción al análisis y gestión de riesgos". In Cantos, Jorge Olcina e Ayala - Carc edo, Francisco Javier (Ed.) – Riesgos naturales, Ariel Ciência, Barcelona.

BOGDAN, R. C. & Biklen, S. K. (1994). Investigação qualitativa em educação. Porto: Porto Editora.

CABRAL, F. Veiga (2006) - Higiene, Segurança, Saúde e Prevenção de Acidentes; Verlag Dashofer Edições Profissionais, Lda

CANÁRIO, R. (2007, Novembro). Aprender sem ser ensinado. A importância estratégica da educação não-formal. Em Conselho Nacional de Educação (Ed.), A educação em Portugal (1986-2006). Alguns contributos de investigação, (pp. 207-267). Lisboa: CNE

CARDIM, J. E. V. C. (2005). Do ensino industrial à formação profissional: as políticas públicas de qualificação em Portugal. Lisboa: ISCSP – Universidade Técnica de Lisboa.

CORREIA, A. M. R. & Mesquita, A. (2006). Novos públicos no ensino superior – Desafios da sociedade do conhecimento. Lisboa: Sílabo.

EMERGENCY MANAGEMENT AUSTRALIA (2004), Emergency Risk Management Applications Guide, Manual 5, Dickson.

HADDOW, George D. e BULLOCK, Jane A. (2006) - Introduction to Emergency Management, second edition.

JULIÃO, R. P., NERY, F., RIBEIRO, J. L., BRANCO, M. C., ZÊZERE, J. L. (2009) – Guia metodológico para a produção de cartografia municipal de risco e para a criação de sistemas de informação geográfica (SIG) de base municipal, Autoridade Nacional de Protecção Civil, Lisboa.

LOURENÇO, Luciano – "Riscos Naturais e Protecção do Ambiente", Coimbra: Colectâneas Cindínicas; 2004.

MAI, Ministério da Administração Interna (2009) – "Compilação Legislativa – Protecção Civil", 2ª edição. ANPC, Lisboa.

MENDES, José Manuel (2007) – "Vulnerabilidade Social, Risco e Segurança das Populações: o papel do Planeamento". FEUC,Coimbra.

NEVES, A. O. (Coord.). (2005). Estudo de avaliação das políticas de aprendizagem ao longo da vida. Colecção Cogitum nº 17. Lisboa: DGEEP/MTSS.

Pires, Patrícia; (2005) - Metodologia de Avaliação de Riscos Ambientais para apoiar a elaboração de planos de emergência;
REBELO, F. (2001) – Riscos Naturais e Acção Antrópica, Coimbra – Imprensa da Universidade, 2º edição revista e aumentada.

SIMÕES, M. F. & Silva, M. P. (2008, Dezembro). A operacionalização de processos de reconhecimento, validação e certificação de competências profissionais – guia de apoio. Lisboa: Agência Nacional para a Qualificação.

CAREER AND TECHNICAL EDUCATION COURSES – AFTEBI A BET ON POST SECONDARY STUDIES OTHER THAN UNDERGRADUATE OR GRADUATE COURSES

Cristina Menaia . Ema Oliveira . Luís Gonçalves

Abstract

A brief historic comment of post-secondary training other than undergraduate or graduate courses is presented in this work, namely those regarding CTE – Career and Technical Education courses, based on the laws produced and on the evolution of this type of training offer. The data obtained on the field by a group of promoting entities – the Technological Schools (TS) – will be outlined, describing some of their mainly competences and presenting a succinct description of its organizational model.

Based on a case study of one of those TS, AFTEBI, the results obtained through auto-evaluation and external evaluation activities are presented, as well as the parameters considered relevant for the success of its functioning model.

The illustration of these aspects is done making use of monitored data throughout the years, focusing on the efficiency level of learning and the resources involved, and also by the discussion of best practices, analyzing their strengths, weaknesses, threats and opportunities.

Keywords
CTE – Career and Technical Education Courses, Post-secondary Training, Technological School, Intermediate level staff, Case Study.

Introduction

Portugal is facing the enormous challenge of increasing the level of qualification of Portuguese people, by promoting initiatives that lead to a significant improvement in social-economic indicators. *"To win this enormous challenge Portugal must be able of better qualifying its youth, fighting, in particular, the high percentage of premature school-leaving (which nowadays results that only around fifty percent of our youth aged between 20 and 24 have concluded secondary studies successfully) and giving new opportunities to adults, promoting their school recovery and professional requalification"* [1]. Numerous are the measures adopted, noting a strong bet in training models of double certification, from which the CTE – Career and Technical Education courses (CET - Cursos de Especialização Tecnológica) stand out and are the focus of this work. From a brief description of the offering evolution of CET in Portugal, we will seek, at the beginning, to analyze the macro environment in which this kind of training is inserted to proceed with a more thorough perspective of its functioning outside

undergraduate and graduate studies (ES – Ensino Superior). In order to do this the main objectives for this work were set: i) understand the legal and institutional scope given to CET throughout time; ii) clarify the role of ET (Technological School) from the Ministry of Economy, Innovation and Development (MEID) had in this kind of training; iii) analyze the model of organizational development of one of these ET and the results achieved; and iv) discuss successful cases, identified as potential carriers of multiplying effects.

Evolution of the legal and institutional scope of CET

The offering of CET in Portugal started within a group of ET created in the 90's with the support of the former Ministry of Industry and Energy, due to the shortage of intermediate staff felt among companies and due to the weakness of existing teaching and qualification systems, namely the extinction of technical teaching that prepared the so-called "intermediate technician and/or intermediate staff". As a consequence, the ET appeared with the goal of promoting the initial training of young people in technological areas, at a post-secondary level , granting nowadays a Level V[2] Professional Qualification , through the Diplomas of Technological Specialization (DET).

According to Pereira (2009), the first citations about CET appeared associated with the documents that were in the genesis of the ET; also the legal evolution in which this type of training offer fits throughout the years has undergone multiple changes since its creation in 1990, but only with the publication of the DL 88/2006 (Act 88/2006) of 23rd of May, "the recognition and formal dignifying of post-secondary offers thru the political point of view, by given a legislative superior and autonomous status" is obtained (Santos, 2010, p. 133). Also the publication of Decree no. 782/2009, of 23rd of July, which regulates the National Board of Qualifications and defines the descriptors for the characterization of the national qualification levels, gives CET a designated space.

After the publication of Act 88/2006, the typology of the institutions that offer CET is extended, including institutions of Secondary Studies (ES) and other entities, such as Secondary Schools, Professional Training Centers, ET (Technological Schools) and other training institutions accredited by the Ministry of Work and Social Solidarity. From the works of Pereira (2009) and Santos (2010), we present in Chart 1 some data related to CET promoted by different Ministries.

[1] Extracto do Preâmbulo do DL 88/2006 de 23 de Maio.
[2] Portaria n.º 782/2009, de 23 de Julho.

Academic years	Number of Students				Number of Graduates			
	ME	MCTES	MTSS	MEID	ME	MCTES	MTSS	MEID
2001/2002	---	---	24 (a) (d)	604 (e)				931 (g)
2002/2003	638 (a) / 940 (b)	---	124 (a) (d)	749 (e)	423 (g) / 572 (i)			
2003/2004	1767(a) / 1558 (b)	---	305 (a) (d)	844 (e)	681 (g) / 726 (i)			
2004/2005	2040 (a) (b)	294 (a) (c)	466 (a) (d)	906 (e)			80 (g) / 150 (j)	838 (g)
2005/2006	860 (a)	1259 (a) (c)	536 (a) (d)	1120 (e)		233 (g) (h)	193 (g) / 212 (j)	
2006/2007	---	2253 (a) (c)	596 (a) / 506 (d)	2274 (f)		878 (g) (h)	177 (g) / 207 (j)	
2007/2008	---	4811 (a) (c)	614 (a)	2398 (f)			288 (g)	859 (g)

Source:
(a) - data provided by Pereira (2009 - p. 285)
(g) - data provided by Pereira (2009 - p. 289)
(b) - data provided by Santos (2010 - p. 141)
(h) - data provided by Santos (2010 - p. 139)
(c) - data provided by Santos (2010 - p. 136)
(i) -data provided by Santos (2010 - p. 143)
(d) - data provided by Santos (2010 - p. 145)
(j) - data provided by Santos (2010 - p. 146)
(e) - the data are not fully disclosed, because the MEID does not have records for all the TS (Pereira; 2009 - p. 280).
(f) Since the school year 2006/2007, the data considered include the totality of TS (IAPMEI; 2010).

Chart 1. Evolution of students and graduated of CET- ME, MCTES, MTSS and MEID Source: IAPMEI (April 2010)

Regarding the analysis on the national offering by areas of training and regions, and considering the information available at the site of DGES - General Direction of Higher Education (Direcção Geral do Ensino Superior), the registered published CET until 16 of December, are presented, grouped by Ministries.

Ministries		Institutions with registered and published CET on 16/12/2010		Registered and published CET on 16/12/2010		Average number of CET/Institution
		number	Distribution%	number	Distribution%	
Science, Innovation and Higher Education	Polytechnic education	25	28,09%	234	53,18%	9
	University education	24	26,97%	88	20,00%	4
Economy, Innovation and Development		9	10,11%	53	12,05%	6
Education		14	15,73%	24	5,45%	2
Labour and Social Security		17	19,10%	41	9,32%	2
Total		89	100,00%	440	100,00%	5

Source: Site of DGES – General Direction of Higher Education (Direcção Geral do Ensino Superior) May/2011 – registered and published CET until 16/ Dec/2010.

Chart 2. Institutions and registered CET published by Ministries (ME, MCTES, MTSS and MEID)

In chart 3, the percentual distribution of registered CET published by different Ministries is shown.

Study areas	Ministries			
	Science, Innovation and Higher Education	Economy, Innovation and Development	Education	Labour and Social Security
Arts	2,07%	0,00%	0,00%	9,09%
Humanities	1,04%	0,00%	0,00%	0,00%
Social and Behavioral Sciences	1,04%	0,00%	0,00%	0,00%
Business Sciences	20,21%	7,14%	25,00%	13,64%
Law	1,04%	0,00%	0,00%	0,00%
Life sciences	1,55%	0,00%	0,00%	0,00%
Physical Sciences	1,04%	0,00%	0,00%	0,00%
Computing	6,22%	14,29%	25,00%	13,64%
Engineering	24,87%	35,71%	12,50%	36,36%
Manufacturing industries	7,77%	16,67%	0,00%	18,18%
Architecture and Construction	6,22%	0,00%	12,50%	4,55%
Agriculture, Forestry and Fisheries	6,74%	0,00%	0,00%	0,00%
Veterinary Science	0,52%	0,00%	0,00%	0,00%
Health	0,52%	0,00%	0,00%	0,00%
Social Services	3,63%	0,00%	0,00%	0,00%
Personal Services	10,88%	21,43%	25,00%	4,55%
Transport Services	0,52%	0,00%	0,00%	0,00%
Environmental Protection	2,59%	4,76%	0,00%	0,00%
Security Services	1,55%	0,00%	0,00%	0,00%

Source: Site of DGES – General Direction of Higher Education (Direcção Geral do Ensino Superior) May/2011 – registered and published CET until 16/Dec/2010.

Chart 3. Percentual distribution of registered CET published by Ministries according to the area of study

In chart 4 the geographical distribution of registered CET published by different Ministries is presented.

Regions	Science, innovation and higher education	Economy, innovation and development	Education	Labour and Social Security	Total
North	30,34%	20,16%	45,83%	60,32%	32,10%
Centre North	14,24%	19,38%	25,00%	9,52%	15,40%
Centre	6,19%	18,60%	0,00%	9,52%	9,28%
Centre South	14,24%	13,18%	8,33%	0,00%	12,06%
Lisboa and Tagus Valley	16,72%	9,30%	20,83%	17,46%	15,21%
High Alentejo	4,02%	7,75%	0,00%	1,59%	4,45%
Low Alentejo	4,33%	0,00%	0,00%	1,59%	2,78%
Algarve	4,64%	6,98%	0,00%	0,00%	4,45%
Islands	5,26%	4,65%	0,00%	0,00%	4,27%

Source: Site of DGES – General Direction of Higher Education (Direcção Geral do Ensino Superior) May/2011 – registered and published CET until 16/Dec/2010.

Chart 4. Geographical distribution of registered CET published by Ministries (ME, MCTES, MTSS and MEID)

By the data presented we realize that, apart from the Ministry of Science, Technology and University Studies (MCTES), the ones that show more activity in this offering typology are the institutions connected with the Ministry of Education, Innovation and Development (MEID) (the ET and the Institute of Tourism of Portugal that only starts promoting CET in 2006). According to the data made available by MEID (IAPMEI; April 2010), between 2006 and the beginning of 2010, the scenery is the one presented in chart 5.

Nº de Alunos por Área de Formação

Escolas Tecnológicas	Área de Formação	2006			2007			2008			2009			2010		
		CET	Turmas	Alunos	CET	Turmas	Alunos	CET	Turmas	Alunos	CET	Turmas	Alunos	CET	Turmas	Alunos
(privado)	342 - Marketing e Publicidade	6	7	81	5	6	53	4	4	40						
	345 - Gestão e Administração	9	16	225	9	17	227	6	12	175	4	8	118	7	11	131
	347 - Enquadramento Organização/Empresa	0								48	5	5	77	11	11	200
	481 - Ciências Informáticas	16	31	468	14	39	661	13	31	558	14	21	311	18	25	308
	521 - Metalurgia e Metalomecânica	17	46	635	16	44	603	20	45	633	15	23	347	19	24	318
	522 - Electricidade e Energia	3	3	28	2	2	20	4	7	117	5	8	126	5	8	94
	523 - Electrónica e Automação	10	19	269	11	19	267	9	15	239	6	11	145	12	15	201
	524 - Tecnologia dos Processos Químicos	4	9	152	3	8	125	3	10	172	7	9	172	7	9	172
	540 - Indústria Transformadoras	2	2	31	2	3	42	2	3	42	2	2	40	2	2	40
	541 - Indústrias Alimentares	6	11	184	6	10	184	8	15	275	8	11	200	10	13	236
	542 - Indústria Têxtil, Vestuário, Calçado e Couro	4	8	81	4	7	73	3	4		1	2	23	4	5	68
	850 - Protecção do Ambiente	0						1	2	56	2	2	25	2	2	25
	851 - Tecnologia de Protecção do Ambiente	2	6	103	2	6	105	2	7	25	4	5	100	4	5	100
	Subtotal	79	158	2257	74	161	2360	75	155	2513	73	107	1684	101	130	1893
ITP (público)	811 - Hotelaria	1	1	15	2	2	38	2	2	46	17	23	471	30	36	748
	812 - Turismo e Lazer										4	4	82	2	2	41
	Subtotal	1	1	15	2	2	38	2	2	46	21	27	553	32	38	789
	Totais	80	159	2272	76	163	2398	77	157	2559	94	134	2237	133	168	2682
	TOTAL CET	460														
	TOTAL TURMAS	781														
	TOTAL ALUNOS	12148														

Nota: A redução de cerca de 1000 alunos das Escolas Tecnológicas a partir de 2008, deve-se ao facto do POPH ter reduzido os apoios a estas escolas face ao que era disponibilizado até 2007 e pelo facto de terem terminado os apoios na região de Lisboa.

Chart 5. Number of CET (registered and with a valid authorization), of classes and students, according to the area of training

Regarding ET (Technological Schools) and according to information made available by the Network of Technological Schools (December 2010), the beginning of activity, the intervention areas and the geographical location are presented in the following table:

Schools	Year of beginning of activities	Area CNAEF (Codes) in which they have registered and published CET on 30/10/2010 (*)	Geographical location of training offers	Functioning on 30/10/2010
AESBUC	1991	524 – Technology of Chemical Processes; 541 – Food industry; 851 – Technology of Environment Protection.	Porto, Caldas da Rainha e Sintra	√
AFTEBI	1997	347 – Organization/Enterprise Fitting; 481 – Computer Science; 522 – Electricity and Energy; 523 – Electronics and Automation; 541 – Food Industry; 542 – Textile, Garment, Shoes and Leather Industry; 850 – Environment Protection.	Covilhã, V. N. Famalicão, Castelo Branco, Guarda e Vouzela	√
AFTEM	1988 – North 1990 - Lisbon	521 – Metallurgy and Metalwork; 522 – Electricity and Energy.	Ermesinde e Lisboa	(1)
ANFEI	1997	(2)	(2)	(2)
ENTA	2001	347 - Organization/Enterprise Fitting; 481 – Computer Science; 523 – Electronics and Automation; 541 – Food Industry.	Açores (S. Miguel)	√
ESTER	1997	540 – Manufacturing Industries	Borba and Alpendurada	√
FORESP	1998	345 - Management and Administration; 481 – Computer Science; 521 - Metallurgy and Metalwork; 523 – Electronics and Automation.	Vale de Cambra	√
FORINO	1990	345 – Management and Administration; 481 – Computer Sciences; 522 – Electricity and Energy; 523 – Electronics and Automation.	Lisbon	(3)
NOVOTECNA	1991	347 - Organization/Enterprise Fitting; 521 - Metallurgy and Metalwork; 523 – Electronics and Automation.	Coimbra, Viseu, Pombal, Leiria, Guarda, Castelo Branco and Aveiro	√
ETDI	1998	(**)	(**)	(**)
TRIÁLOGO	1998	(**)	(**)	(**)

(*) Source: DGES – General Direction of Higher Education (Direcção Geral do Ensino Superior) data updated on 11/11/2010.
(**) There is no available record to characterize the analyzed parameters.
(1) Although it still has registered CET, AFTEM has been integrated in CENFIM – Professional Training Center for the Metallurgy and Metalwork Industry (Centro de Formação Profissional da Indústria Metalúrgica e Metalomecânica).
(2) Since 2004 it has ceased its activity as Technological School, changing thru a Program-Contract at ATEC – Training Association for the Industry.
(3) Although it still has registered CET, FORINO has been integrated in CINEL – Professional Training Center for the Electronic Industry (Centro de Formação Profissional da Indústria Electrónica).

Table 1. ET – Beginning of activity, intervention areas and geographical location

According to what we realized, the areas of study where the ET develop their offer are focused, mainly, on the transforming industries e on the traditional sectors with greater weigh on the national economy, namely the textile and garment industry, mining, metallurgy and metalwork, agro-feeding, chemical, paper, electricity and energy, and construction.

The intervention of these ET was oriented by sectors in the beginning, although an expansion of professional profiles has occurred later, as a result of their proximity to the productive area and of the needs that the late was imposing on them. Their recognition as dynamic poles of knowledge by the enterprises made it possible that, regionally, the necessity of conceiving other expanded answers with a less sectorial orientation. The starting of courses in the area of Computing, Quality and Environment, and Entrepreneurial Sciences are examples of this change.

Based on the information previously presented, we can conclude that: i) the demand for CET has increased with time, both for students and graduated ones, regardless the typology of the institution that promotes them; ii) with the Act 88/2006, the greater growth is of the MCTES; iii) the ET of MEID were pioneers in offering CET; iv) more than half of the institutions that have registered CET are part of MCTES; v) more than two thirds of registered CET belong to MCTES institutions; vi) on average the MCTES and MEID are the ones that present a greater number of registered CET by institution; vii) the area of "engineering and related techniques" is the most expressive for MCTES; MTSS and MEID; viii) the regions with greater concentration of registered are the Center, for the MCTES and for the MEID, and the North for the MTSS and ME; and, ix) within MEID the institutions with greater expression and tradition in the offering of CET are the ET, focused on the promotion of CET that aim especially the performing of professions associated with the transforming industries and with the traditional sectors with greater weigh on the national economy.

Methodology

When the options for doing the empiric work were selected we opted by a qualitative research methodology, using a descritive case study as a research estrategy.

Basis of method and case choice

In choosing the methodology, the selection of study cases is naturally associated with the fact that it is the most appropriate for the type of communication and to the proposed objectives.

The selection of the case AFTEBI is due to several factors, from which we outline the following: i) it is one of the institutions that was created to promote this typology of training in Portugal (ET of MEID); ii) its main purpose is the organization of post-secondary training, oriented to strategic areas; iii) the volume of CET training, outside ES and inside MEID; iv) the seniority in promoting CET; v) the number of students enrolled and graduated; vi) the fact that two of the researchers have bonds to the institution (Executive Director and Vice-President of the Board), this way the access to information and knowledge being facilitated.

Technique used for data collection

The technique used relied solely on document analysis because, besides being easy to access, it gives a high amount of information. As a matter of fact, this technique is very important in the scope of qualitative evaluation and social/educational research because it provides information that most of the times are not available in oral records and it allows knowledge access ate the time it was produced, according to Pereira (2006).

The documents used are part of this research and are in keeping with the set goals, having the following origin:

1- Documents generated internally by the study case institution, such as: reports and activity plans, intervention plans and assessment plans, various forms sent to financial management entities, various reports (evaluation, satisfaction/reaction, learning process, impact, internal audits, critical reports of teachers, etc), internal regulation, meeting's minutes and the documents related to the process of creation and registration of CET, among others.

2- External documents, among which the national legislation stands out, various documents provided by the Portuguese government, by the European Commission and other official entities (national and communitarian), as well as all scientific documents (thesis, articles, magazines and books), reports and statistics provided by official organisms (national and communitarian) related to this theme and external evaluation reports done to AFTEBI.

The analysis of the internal documentation will allow the presentation of the study case, leading to the release of data for the analysis of the organizational model functioning of one of the ET of MEID, and the results obtained (objective iii). The external documents will allow the understanding of legal and institutional scope of CET throughout times (objective i), and will clarify the role that the ET of MEID had in this typology of training (objective ii).

The cross reference of these sources of information will make it possible to confront and contrast the collected data, leading to a triangulation of data (Moreia, 2007), and it will encourage the discussion of best practices with potential multiplying effects (objective iv).

Data analysis technique

The most adequate research techniques were used, considering the nature of data according to the research objectives, the characteristics of the study and also the limitations of the researchers.

To respond to the objectives set and to make the conclusions of this study more reliable, we have opted by collecting the information using varied analysis

instruments. Active observation and documental analysis were the chosen techniques because they can cross referenced and because they allow a triangulation among the research instruments. One of the authors being independent to the analyzed case, her evaluation and critical spirit allowed that the data interpretation and the conclusions presented were free of distortion or lack of clarity or ambiguity.

The analysis of results privileged the descriptive approach of the empiric variables studied, the comparative study with the reference data, and their interpretation in light of the set objectives.

Analysis and Discussion of Results

Before moving on the descriptive and analytical approach of data we will characterize the Institution, based on the content analysis of several internal documents, crossed with the information resulting from the practical knowledge and experience by two of the authors.

AFTEBI as training institution promoter of CET

On this characterization a model presented by Santos (2010) was used, which will allow the formulation of several considerations resulting from the comparative study between this study case and the training institutions referred [3].

Categories	Sub-categories	Characterization / Description
Institutional mission	Procedures of surveying individual and economic needs	This school is in close contact with the socio-economic groups of the regions where it exerts greater influence, due to its organizational model and to the network of institutional partners (Industrial and Entrepreneurial Associations, Institutions of Higher Studies, Secondary and Professional studies, as well as a Technological Centre and a Public Institute supporting enterprises, several City Halls e companies). Its knowledge of the social and economic needs is acquired through contacts with the intervenients that collaborate, direct or indirectly in the surveys/diagnosis the training necessities developed every two years (accompanying the training cycle of CET and the irrespective requests for renewal and functioning authorization). The school consults regularly with the enterprises and with its graduated students' employers in order to keep up with the evolution of demand for qualified work, operating with enough celerity to provide timely training alternatives, adjusted to the changes and demands of the current working context, or , in emergency situations, provide a short term answer.
	Students	See topic 5.2
	Technical and Human Resources	The school has a group of technical staff that coordinates, manages and performs the various tasks related to the implementation and monitoring of its institutional mission which is the development of supporting instruments to its strategy and policy of promoting post secondary training other than undergraduate or graduate studies.
	Efficiency	The performance shown throughout the years towards the fulfillment of its objectives and mission has been considered very satisfactory by its directors, sponsors and final beneficiaries (graduated students and companies). The criteria/indicators that support this evaluation are the employment rate, the rate of further studies, the rate of conclusion of CET, and the level of efficiency obtained throughout the years (see figures presented farther), among other aspects.

Table 2. Institutional Mission

Categories	Sub-categories	Characterization / Description
Institutional mission	Procedures of surveying individual and economic needs	This school is in close contact with the socio-economic groups of the regions where it exerts greater influence, due to its organizational model and to the network of institutional partners (Industrial and Entrepreneurial Associations, Institutions of Higher Studies, Secondary and Professional studies, as well as a Technological Centre and a Public Institute supporting enterprises, several City Halls e companies). Its knowledge of the social and economic needs is acquired through contacts with the intervenients that collaborate, direct or indirectly in the surveys/diagnosis the training necessities developed every two years (accompanying the training cycle of CET and the irrespective requests for renewal and functioning authorization). The school consults regularly with the enterprises and with its graduated students' employers in order to keep up with the evolution of demand for qualified work, operating with enough celerity to provide timely training alternatives, adjusted to the changes and demands of the current working context, or , in emergency situations, provide a short term answer.
	Students	See topic 5.2
	Technical and Human Resources	The school has a group of technical staff that coordinates, manages and performs the various tasks related to the implementation and monitoring of its institutional mission which is the development of supporting instruments to its strategy and policy of promoting post secondary training other than undergraduate or graduate studies.
	Efficiency	The performance shown throughout the years towards the fulfillment of its objectives and mission has been considered very satisfactory by its directors, sponsors and final beneficiaries (graduated students and companies). The criteria/indicators that support this evaluation are the employment rate, the rate of further studies, the rate of conclusion of CET, and the level of efficiency obtained throughout the years (see figures presented farther), among other aspects.

Table 3. Training Programs

[3] On this work the following institutions were object of study: IES (ISCAA – Instituto Superior de Contabilidade e Administração de Aveiro; ESAN – Escola Superior Aveiro Norte; ESTGA – Escola Superior de Tecnologia e Gestão de Águeda) e uma ET (FORESP - Associação para a Formação e Especialização Tecnológica).

Categories	Sub-categories	Characterization / Description
Training programs	Offer definition - Procedures	The definition of the training offer is dictated by the demand, in an attempt to give medium-terms training answers to the economic needs; the enterprises have a significant influence in this definition. The existence of professional profiles defined by AFTEBI is a reality for more than 13 years. Since the employment rate of the promoted CET has been one of the priority criteria in the orientation given to AFTEBI intervention, the survey among the graduated students, companies and their representatives has been vital in the conception and validation of training programs.
	Revision and adaptation of offering	The revision has been made with a minimum periodicity of two training cycles since on the first cycle the evaluation is done and on the second the necessary changes are confirmed. Regarding adaptations, when inevitable, they are done in-between this interval, occurring mainly in the training practices performed by the teachers and are a result of the adjustment of the contents to the level of knowledge of the students. All these adjustments and changes are supervise by the course coordinator and are validated by the companies and their representatives. It is worth referring that the bureaucracy associated to the process of registering and reviewing of a CET, as well as the slowlyness in their approval is a hamper factor to a regular reviewing and adjustment to training programs.
	Satisfaction level (perception and evaluation mechanisms)	AFTEBI has several instruments that allow it to feed the indicators parameters, which guarantee the monitoring and recording of social and economic satisfaction levels in comparison to the training offering. This happens not only because it is a compulsory procedure in terms of training entity accredited by DGERT, but also because of an internal necessity of justifying the line of work to its associates; so AFTEBI pays special attentions to these aspects. Also, many of the indicators used are a consequence of the necessity of providing regular information to the sponsor organisms. AFTEBI also hires external entities for the evaluation of the training courses promoted and has the reports as a support for the satisfaction/impact level as an auxiliary means for decision making.

Table 4. Curricula and Organization

Categories	Sub-categories	Characterization / Description
Financial Capability	Free access	AFTEBI does not promote free access since the students will have to pay a tuition fee; the only ones exempted from this are students are those whose family income is less than the minimum national wage. The amount of the tuition fee if of € 375,00 for the whole course.
	Financing sources	The financing of its training activity has been provided mainly by the Communitarian Funds (PEDIP, POE, PRIME, and currently, POPH) and a residual percentage comes from the associates and from training revenue (tuition fees).
	Difficulties in accessing financing	Regarding the access to financing, AFTEBI has been experiencing some difficulties, due to unadjusted process regulations. The delays in publishing the CET on CNQ by ANQ, have led to the financial inviabilization of some CET. The inexistence of a fixed schedule to present the financial applications has been proved to be hamper factor in the appropriate planning of CET offerings, causing constraints to those who want to proceed to higher studies. Finally, the reduced budget has caused a decrease in the number of classes/courses, contrary to the demand tendency (both by youth and enterprises).
	Financial sustainability	Until the end of QREN the financing thru communitarian funds, although reduced, is assured. By 2013 the transition of this and other ET to other Ministries will be studied and negotiated, so as to guarantee the continuity of its functioning.

Table 5. Financial Capability

To do a critical analysis of this characterization, in comparison to the conclusions reached by Santos (2010), we have built Table 6 .

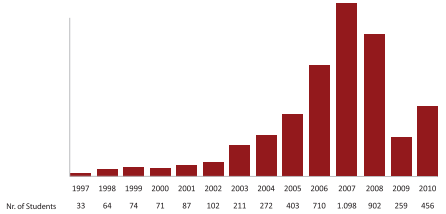
Results reached by Santos (2010), when surveying the institution carried on during the research	Position of AFTEBI		
	Different and less favourable	Equal	Different and more favourable
"The definition of offer is not supported by a prospective approach of regional social-economic needs, being the product of an individual institutional vision"			X
"The economic mission of providing workforce to meet the needs of local employers, it is an important factor in the definition of CET offering. However, the answers to these demands are short-term ones."			X
"The involvement of other agents in the programming and conceiving CET offers is little or of nearly no significance."			X
"The curricula organization of CET mainly on nighttime regime, privileges the access to a target group that otherwise would have their academic life hampered."	X		
"The institutions do not have structures and mechanisms that assure the monitoring and evaluation need for the accomplishment of these offers, neither at a social level nor at an economic level."			X
"Free access to CET is not available at none of the institutions. On the other hand, the costs are significantly lower when compared to other post-secondary training."		X	
"Bureaucracy and slowliness in the process of approving offers and in the access to financing, together with centralized processual and organizative procedures, is pointed out by all institutional agents as a hamper factor to the good accomplishment of these offers."		X	
"The sustainability of CET offers is strongly conditioned, in the case of institutions of higher education, by a policy of institutional management, and in the case of other entities, by the availability of financing."		X	

Table 6. Summary of critical and comparative analysis between AFTEBI and Santos (2010, p. 214)

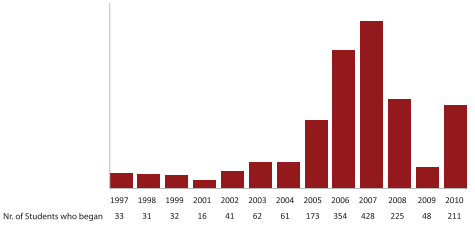
We are at “the presence of a fragile model and training policy, dependent on external factors, as, for instance, a higher education training policy and of the access to external financing.” (Santos, 2010 – p. 215).

Presenting results

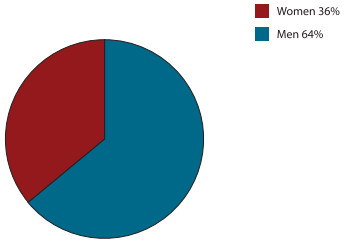
On the next graphs and tables the CET students of AFTEBI are presented, based on the Reports and Accounts from 1997 to 2010:



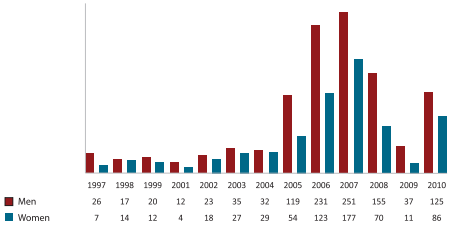
Graph 1. Number of students in CET



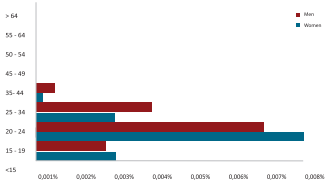
Graph 2. Number of students who began CET



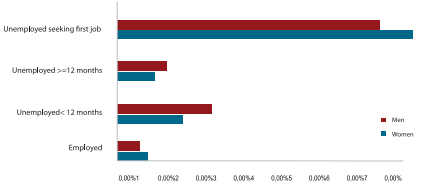
Graph 3. Students by Gender



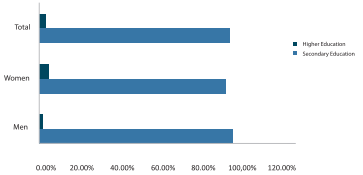
Graph 4. Students by Gender thru time



Graph 5. Students / Age / Gender



Graph 6. Students / Gender according to employment



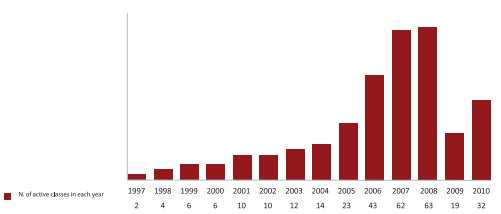
Graph 7. Students/Gender/Qualifications

School year	Students - AFTEBI	Students - Technological schools of MEID	% AFTEBI students in total of TS of MEID
2006	710	2257	31,46%
2007	1098	2360	46,53%
2008	902	2513	35,89%
2009	259	1684	15,38%
2010	456	1893	24,09%

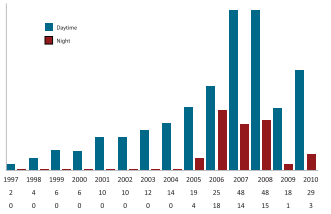
Source: AFTEBI - Report and Accounts 2006 to 2010 and, IAPMEI (April 2010)

Chart 6. Students in AFTEBI and in ET

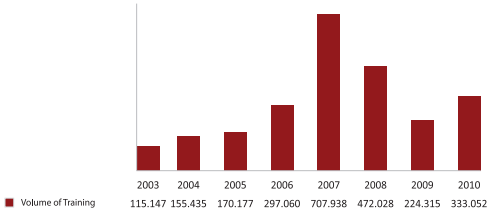
Regarding the number of active classes, functioning regime and training volume, based on the Reports of acomplishment of years analysed, the following graphs were obtained:



Graph 8. Number of Active Classes



Graph 9. Number of Active classes / Regime



Graph 10. Volume of Training

Regarding graduated students, their characterization is presented through the following charts:

Year of the beginning of training	Conclusion rate (completed / enrolled)	Approval rate (Graduates / Finish)	Employment rate (Graduates Employed / Total Graduates)	Rate of further Studies in Higher Education (Diploma in ES / Total Graduates)
1997	52%	100%	100%	0%
1998	81%	92%	87%	13%
1999	59%	100%	95%	0%
2001	100%	81%	85%	8%
2002	100%	93%	92%	3%
2003	94%	98%	84%	0%
2004	95%	90%	73%	10%
2005	83%	99%	85%	0%
2006	82%	91%	88%	12%
2007	84%	91%	76%	18%
2008	74%	100%	52%	19%
Average figures for the period	0,7	0,94	0,78	0,12

Source: AFTEBI – Reports and Accounts from 1997 to 2010 and Balance of Activities from 2003 to 2010.
Note 1: The data are available until the 2008 edition that was concluded in 2010, because the 2009 and 2010 editions are still in training.
Not2 2: The students who started working while attending CET ou who were employed at the beginning were not considered in the Employment Rate.
Note 3: The graduated students who were employed were not considered in the Rate of Further Studies, even though some have enrolled after concluding the CET.

Chart 7. Conclusion, Approval, Employability and Further Studies (Dec, 2010)

Area of Training	Employment rate by Area of Training after concluding CET	Rate of further Studies in Higher Education (Undergraduate Studies)
340 – Business Management	80%	15%
347 – Organization/Enterprise Fitting	28% (a)	12% (a)
481 – Computer Science	71% (a)	29% (a)
521 – Metallurgy and Metalwork	84% (a)	9% (a)
522 – Electricity and Energy	46% (a)	39% (a)
523 – Electronics and Automation	69% (a)	19% (a)
541 – Food Industries	55%	27%
542 – Textile, Garment, Shoes and Leather Industry	84% (a)	4% (a)
850 – Environment Protection	40%	15%
999 – Unknown or unspecified	74%	19%
Average figures	78%	12%

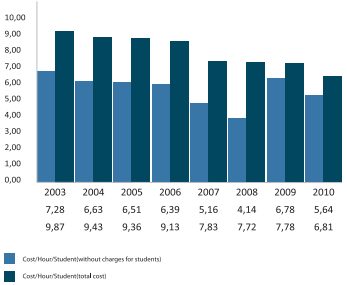
Source: AFTEBI – Reports and Accounts from 1997 to 2010 e Balance of Activity from 2003 to 2010.
(a) There are students still in training; so the indicated value is not final.
(b) the data were updated on 31/12/2010 and consider only the students who have concluded training until then since the beginning of AFTEBI activity.

Chart 8. Employability and Further Studies by area of training (Dec, 2010)

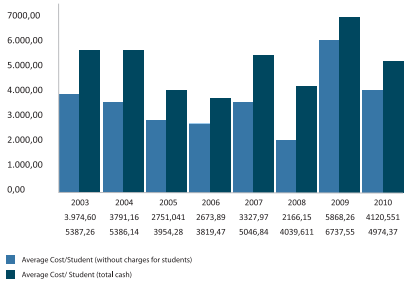
CET name	Final	Internship
	Grade	Average
Textile Design	14,96	15,89
Garment	15,2	15,84
Textile Finishing	15,35	16,46
Industrial Maintenance	14,14	15,67
Automation, Robotics and Industrial Control	14,75	15,99
Wind Energy and Technology	13,08	15,62
Management Computing Applications	14,65	15,66
Multimedia Products Development	14,34	16,39
Installation and Maintenance of Networks and Computer Systems	14,27	16,02
Software Development and Systems Administration	15,01	16,86
Food Quality	14,68	16,18
Quality, <environment and Safety	14,8	17,17
Water and Effluents Treatment	15,21	17,15
Global Average	14,57	15,68
Source: Grades and evaluation maps and grids from AFTEBI – Graduated until 31/12/2010.		

Chart 9. Average conclusion grades and evaluation obtained in internship by CET (Dec, 2010)

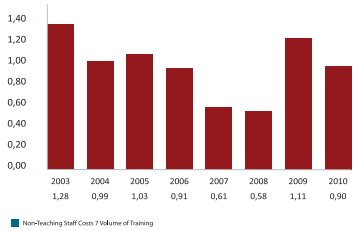
Regarding efficiency indicators (used in self-evaluation and external evaluation) we wiil present the following:



Graph 11. Cost/Hour/Student (Euros)



Graph 12. Average cost/Student (Euros)



Graph 13. Cost of non-teaching staff (Euros)
Source: Reports and Accounts from 2003 to 2010

Although an extended set of other indicators are not available, these are the ones of greater interest for this work, and are easily adapted to any other institution that promotes CET.

Analysis of the Results

Studying the data presented here and taking into consideration, when comparable, the results reached by Pereira (2006), Pereira (2009) and Santos (2010), among other sources consulted, we have observed the following:

1 – a growth of AFTEBI throughout the years, with a decrease of activity after 2007, showing signs of recovering by the end of 2009 towards 2010. This scenery is a result of the reduced budget available by the only financing measure available (Medida 1.4 of POPH);

2 – AFTEBI students are mainly:

- males (64%), as shown in the study cases referred, with the tendency thru the years;
- young people (more than 50% of both sexes are aged 20 and 24 years old), with identical results as Santos (2006) and Pereira (2010);
- unemployed (more than 90%), contradicting the tendencies verified on the three studies indicated and, justifying the fact that the CET operate in their majority during daytime, in full time regime;
- have the 12th form completed (secondary school) and there is residual existence of students with higher education degrees, which is natural considering the access conditions throughout times;

3 – the impact of AFTEBI's activity (number of students) on the global activity of MEID, shows a great significance in the past years (around half in 2007 and one fourth in 2010);

4 – comparing the year of 2007 in AFTEBI (1.098 students), with the total of 2007/2008 in the ES (4.811 students - Chart 1), we see that AFTEBI had an activity correspondent to approximately 1/5 of the one developed by ES;

5 – on average 70% of enrolled students finish the CET and 94% of those finish it successfully;
6 – the average employment rate, comprising the total number of graduated students from AFTEBI until December/2010, is of 78%;
7 – the average rate of students who continue to a higher education course is of 12%, varying according to the CET and in time;
8 – on average the final grades in the courses varied between 13,08 and 15,35 marks, and in the trainingship (where the classification is given by the company), the marks are always greater, reaching 17,17 marks;
9 – regarding the financial indicators, in the absence of comparable references, it is only important to refer the favourable evolution cost/hour/student (total eligible cost divided by the sum of the total hours attended by each student) thru the years.

Successfull practices

As a result of continuous studies and observations, based on self-evaluation and external evaluation activities, a SWOT analysis was done, and it is reflected in the following matrix:

Strengths	Weaknesses
- Experience in offering CET (14 years of activity); - Proximity to socio-economic tissue and to the scientific and technological systems; - Recognition obtained by students and employers; - Variety of the institutional partnership networks that lead and comprise it; - Organizational flexibility, with matrix management of needs and complementability of resources; - Diversity and quality of the teaching staff; - Quality and seriousness in the follow up and evaluation of promoted training; - Marked entrepreneurial management;	- Inexistence of financial resources aiming self-sustainability; - High dependency on the financing application periods to optimize the functioning of the CET.
Opportunities	**Threats**
- Political investment and bet in increasing the level of qualification of Portuguese people (the CET are courses of double certification); - Increase of Portuguese population with secondary studies completed, on short and medium terms; - Level of general recognition of CET: greater credibility and demand among youth and their families; - Identification of CET as an instrument of promoting Long Life Learning; - High unemployment rates among the active population.	- Significant increase of IES offering CET; - Using of CET as a means of access to ES, making it more difficult to AFTEBI to fulfill its mission of meetings the needs of the work market; - High dependency of external funds and third parties; - Inexistence of budgeting capacity of MEID to maintain the ET.

With reference to successful practices, associated to “Strengths” and “Opportunities”, the following stand out:
1- Proximity to the target group, which is reflected on the high ability to attract young people through: (a) Advertising initiatives promoted continuously (various activities with the developing of themes in secondary and professional schools, as well as in Professional Training Centres and Employment Centres of IEFP); (b) the word-spreading from graduated students who, due to their successful experience, promote AFTEBI and the CET promoted by it, (c) companies as privileged marketing carriers because of their involvement in the conception of training offers, is one of the initiatives that contribute to referring candidates (collaborators relatives) and to the promotion of AFTEBI.
2 – Network of Institutional Partnerships that efficiently assure the functioning and success of AFTEBI, by: (a) collaboration protocols; (b) protocols with Entities that act in the training process, whose offers appear as preparatory/complementary to the ones promoted by AFTEBI, assuring a perfect articulation and greater quality of graduated students available for the enterprises.
3 – Recruiting and selection of teaching staff, who are, senior consultants, faculty members (secondary and professional schools and universities), experts and technologists of recognized merit, keeping a constant investment in these resources.
4 – Regular and cyclic meetings with enterprises, identifying their needs and involving them in the development of training responses aiming the preparation of the required professional profiles.
5 – Promotion of training sessions (classes) in and industrial/entrepreneurial context, not only during trainingship, but also along the academic year, thru study visits and practical classes at the companies’ premises;
6 – Extended duration of trainingship (FCT), with the maximum number of hours regulated by law and facing this stage of training as one of the main “launching platforms” of students into the labour market.
7 – Trainingship Tutoring assured by a teacher who supervises the trainee academically and who performed by a trainer who supervises the trainee academically and simultaneously provides, indirectly, the consulting firm;
8 – Monitoring, follow up and evaluation of promoted training, with regular meetings, internal audits and the implementation of surveying instruments thru external entities.

Conclusions

Bearing in mind the objectives set for this work we believe that we have achieved the following: (i) to understand the legal and institutional scope given to the CET throughout the years; (ii) to clarify the role that Technological Schools of MEID had in this typology of training; (iii) to analyze the organizational functional model of one of these Technological Schools of MEID and the results achieved; (iv) to discuss some successful practices, as potential carriers of multiplying effects.

Regarding the legal and institutional scope given to CET, we have observed that the number of entities has been extended and that the level of activity has increased significantly, and because of that, a more thorough follow up and evaluation

of the work done so as not to compromise the quality because of the quantity.

The active and positive role that the ET of MEID perform through the impact in the CET offering, their pioneer status and the relevance of their activities are aspects to point out.

In the empiric study some considerations were made, which we believe are relevant to the organizational functional model of one of these Technological Schools of MEID and the results achieved by it.

Based on this case analysis, some successful practices were identified, aiming the transferring and adaptation to other similar contexts.

The scarceness of data and the way in which they are organized, lead to different levels of difficulty in terms of research and they do not promote sustainable knowledge about the real state-of-the-art. In this context we suggest further development of works developed in this area, the application and improvement of a specific evaluation model supported by standard instruments and of efficient application.

Sources

Legal References
Act no. 88/2006, of 23rd May
Decree no. 782/2009 of 23rd July

Bibliography

DGES (February 2010). Cursos de Especialização Tecnológica: Evolução 2006-2009. Retrieved from: http://www.dges.mctes.pt/DGES/pt/OfertaFormativa/CET/CETS+no+Ensino+Superior.htm on 27/05/2011

DGES. Lista de CET no Ensino Superior (updated on 27 of May). Retrieved from: http://www.dges.mctes.pt/DGES/pt/OfertaFormativa/CET/CETS+no+Ensino+Superior.htm on 27/05/2011

DGES. listagem dos CET autorizados a funcionar em instituições de formação que não os estabelecimentos de ensino superior (actualizado em 16 de Dezembro). Retrieved from: http://www.dges.mctes.pt/DGES/pt/AssuntosDiversos/CET+no+Ensino+n%C3%A3o+Superior/ on 27/05/2011

IAPMEI (April 2010). Indicadores do Ministério da Economia, da Inovação e do Desenvolvimento. CET criados e com Autorização de Funcionamento ao abrigo do Decreto-Lei nº 88/2006. Unpublished document. Entrepreneurial Assistance Direction

Moreira, C. D. (2007). Teorias e práticas de investigação. Lisbon: Technical University of Lisbon. Higher Institute of Social and Political Sciences.

Pereira, G. A. (2006). Formação Pós-Secundária Não Superior – Ao Cursos de Especialização Tecnológica do Programa Aveiro-Norte da Universidade de Aveiro – um estudo de avaliação da concepção ao impacte. PhD thesis – University of Aveiro.

Pereira, N. A. O. M. (2009). Cursos de Especialização Tecnológica em Portugal. Um Novo Modelo Não Superior para a Qualificação da População Portuguesa. PhD Thesis – Universidad de Extremadura.

Network of Technological Schools (December 2010). Diagnóstico Institucional das Escolas Tecnológicas. Document presented to the Secretary of State of Industry and Development on 22/12/2010.

Santos, R. S. L. F. (2010). Fundamentos e estratégias na formação pós-secundária de curta duração. PhD Thesis – University of Aveiro.

Simão, J. V., Caetano, I., & Oliveira, J. (1989). Rede de formação profissional para a modernização da indústria: as escolas tecnológicas. Municipal Lybrary Palácio Galveias.

Acronyms and Abbreviations

AESBUC – Associação para a Escola Superior de Biotecnologia da Universidade Católica (Association for the Higher School of Biotechnology of the Catolic University);
AFTEM – Associação para a Formação Tecnológica Engenharia Mecânica e Materiais – Escola de Tecnologia Mecânica (Association for Technological Training in Mechanical Engineering and Materials – School of Mechanical Technology);
ANFEI – Associação Nacional de Formação de Electrónica Industrial (National Association of Training in Industrial Electronic);
ANQ – Agência Nacional para a Qualificação (National Agency for Qualification);
CNQ – Catálogo Nacional de Qualificações (National Catalogue of Qualifications);
ENTA – Escola de Novas Tecnologias dos Açores – Associação (School of New Technology of Azores – Association);
ESTER – Associação para a Formação Tecnológica no Sector das Rochas Ornamentais e Industriais (Association for Technological Training for the Sector of Ornamental and Industrial Stones);
ETDI – Escola Tecnológica para o Design Industrial (Technological School for Industrial Design);
FORESP – Associação para a Formação e Especialização Tecnológica (Association for the Training and Technological Specialization);
FORINO – Associação para a Escola de Novas Tecnologias (Association for the School of New Technologies);
IES – Instituições de Ensino Superior (Institutions of Higher Education);
ME – Ministério da Educação (Ministry of Education);
MTSS - Ministério do Trabalho e da Solidariedade Social (Ministry of Employment and Social Solidarity);

NOVOTECNA – Associação para o Desenvolvimento Tecnológico (Association for Technological Development);
PEDIP - Programa Específico de Desenvolvimento da Indústria Portuguesa (Specific Program for the Development of Portuguese Industry);
POE – Programa Operacional da Economia (Operational Program of Economy);
POPH – Programa Operacional Potencial Humanos (Operational Program for Human Potential);
PRIME – Programa de Incentivos à Modernização da Economia (Program of Incentives to the Modernization of Economy);
QREN – Quadro de Referência Estratégico Nacional (National Reference Strategic Board);
TRIÁLOGO – Escola Tecnológica (Technological School).

POST-SECONDARY NON-HIGHER DUCATION ON THE SCIENTIFIC AREA OF ACCOUNTING

Rute Abreu . Fátima David

Abstract

The research analyses the post-secondary non-higher education on the accounting scientific area through the case study of the Escola Superior de Tecnologia e Gestão do Instituto Politécnico da Guarda (ESTG-IPG). Thus, supported on accounting theoretical and practical research, including the training process requirements, the exercise of the professional activity restrictions and the specialized human resources insufficiencies of the labour market, discusses the needs for economic, social and educational promotion of the Interior Region of Portugal and the integration of Higher Education Institutions (HEI). Methodologically, this research supports on standards and legislation, working papers, statistics and information's issued by various entities in order to highlight potential assigned to the post-secondary non-higher education under three major areas: training and education, employment and socio-professional integration, and sustainable local development, as a result of the consolidation of higher education, in general, and the ESTG-IPG, in particular. The results confirm that, on one hand, the post-secondary non-higher education on the accounting scientific area is an area of enormous potential in the training and education process of students, through its adaptability, its innovative nature and its simplicity of processes. On the other hand, in the current context of worsening problems of access to higher education and the emergence of new social problems, the dynamics create by the post-secondary non-higher education emerge as new forms of organization of the educational process. As a future strategy, it is recommended greater involvement of all stakeholders of HEI with a set of activities that improve the employability of their students and thereby reduces the risk of adverse behaviours of students and their educational process.

Keywords
Post-secondary non-higher education, Legitimacy, Accounting, ESTG-IPG, Portugal.

Introduction

The research analyses the post-secondary non-higher education offered by Higher Education Institutions (HEI) and it is based on the challenge proposed by Foucault (1984) argues that "*one must know how and what extent you can think differently; instead of just legitimize what is already known*".

Despite the reforms carried out in the last decade in higher education, there is insufficient evidence on post-secondary non-higher education, in general, and in the scientific area of accounting, in particular. In fact, higher education institutions publish information to meet requirements of the legislation and to provide to the Society the results of its management according to legitimacy of new public management and to reduce its political cost.

Towards pursuit objectives of the legitimacy theory, this research supports on the proposal, with direct application to accounting, defended by Mautz (1963). Among the definitions expressed in the literature, it is noted that Birch (1993) defines legitimacy as "*the right of free election against the legislature*". While, Luthardt & Zimmermann (2009) argue that the legitimacy theory is based on a combination of two principles: public debate (resolution), and responsibility to publish the annual report (accountability).

In this perspective of new public management, applied to HEI and to the post-secondary non-higher education, the students play a central role, because they get special training through a combination of secondary education, general or professional, with post-secondary technical training responding to expectations of a modern society and the new technological challenges. This education, regulated by Decree-Law No. 88/2006 of May 23 (MCTES, 2006), meets the requirements of *Portaria* No. 782/2009 of July 23 (MTSS, 2009), in establishing the National Qualifications Board and check the level V for this type of education, specifically: "*post-secondary non-higher level with credits to pursuit higher education studies*". It is precisely to promote the pursuit of higher education and to recognize the learning process throughout life, according to different profiles, which allows the student implicitly, based on Article 10 of Decree-Law No. 393-B/99 of October 2 (ME, 1999), to be covered by special contest of higher education access referred in the subparagraph b) of paragraph 2º of Article 3º, where all candidates with specific qualifications have their own places of higher education access.

Thus, the social needs of qualified human resources felt by enterprises and public institutions and individual interests of each citizen imply the emergence of new students at HEIs, in particular, young people who finish technical or professional education at secondary level and, previously, they do not have access to higher education; young people that simultaneous combine education with work; and adults who start higher education several years after having finish secondary education (David, 1995).

In consequence, the Technological Specialisation Courses (TSC) are characterized by "*a high level of technical education, knowledge and qualifications that include higher-level skills; do not require, in general, scientific bases of various areas concerned with TSC; allow to acquire skills and knowledge, through which, independently or self-responsibility based planning, management and/or administration*" (MCTES, 2006).

In the current legal framework, the level V of the National Qualification Board corresponds to "*comprehensive, specialized, factual and theoretical knowledge in a particular area of study or work and awareness of limits of this knowledge; a comprehensive range of cognitive and practices necessary to develop creative solutions to abstract problems; and, also, management skills and supervision on contexts of work or study subject to unpredictable changes; and review and development of self and others performance*" (MTSS, 2009).

Given the above, and with the aim to analyse the post-secondary non-higher education in the scientific area of accounting, this research is divided into five sections. After this introduction, the second section is centred on the conceptual framework of the research. The third section discusses the legal regulation of the Polytechnic Education in the past and in the present. In fourth section becomes clear the external environment of the IPG, based on the proposal by Richardson (2002), and presents the case study of ESTG-IPG in the scientific area of accounting. Finally, the fifth section presents the discussion that summarizes the research.

Conceptual Framework of Research

The European Commission approved the accounting harmonization across the European Union Members through the european Regulations No 1606/2002 (EC, 2002) and No. 1725/2003 (EC, 2003), in order to implementing the International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) publish by the International Accounting Standards Board (IASB). These normatives forced their use in all firms with shares listed on stock markets of the European Union after the fiscal year of 2005.

Later, following the same, Portugal introduced the Accounting Standards System (ASS), approved by the Accounting Standards Committee (ASC) and its application starts on fiscal years on or after January 1, 2010, through which transposed national law to the normative of the IASB (with specific changes) to other firms not covered by EU Regulations.

Thus, the need to create a common accounting language requires new solutions in the professional education process and alternatives to traditional models of higher education. The major change was conceptual, because while the ASS establishes the concepts that underlies the preparation and disclosure of financial statements for external users (assumptions and qualitative characteristics), the Official Accounting Plan (or in Portuguese acronym POC) was based on principles.

The new legal framework, with greater technical and scientific requirements, in parallel with a greater density of information, recognizes the importance of the Official Accounting Technician (or in Portuguese acronym TOC) and the Chartered Accountant (or in Portuguese acronym ROC) on dynamics of the Information System

Accounting, supported by wider teams, where the technical accounting experts hold different knowledge and skills.

De Lange et al. (2006), based on the Mathews et al. (1990) research, consider that the actual biggest concern is associated with length of three years of the accounting degree. In this sense, the ESTG-IPG, considerin the three years of higher education on accounting may be insufficient, given demands of the professional accreditation in the accounting area, has extended its range of education through two levels:

i) Post-secondary non-higher education, with the Accounting Technological Specialisation Course.

ii) 2nd cycle, with the Master of Business Administration, specializing in Accounting.

So, rather than promote the 2nd cycle for the Accounting Professional, it can be essential the secondary education for consolidate the knowledge and professional skills. In their investigations, for example Agyemang & Unerman (1998), Birkett (1993), Brown & McCartney (1995), Gammie et al. (2002), Hutchinson & Fleischman (2003), Kim et al. (1993), LaFrancois (1992), Mathews et al. (1990), Mohamed & Lashine (2003) and Usoff & Feldmann (1998) concluded that there is evidence that technical skills are not enough for successful work in the scientific area of accounting. Thus, it argues the return to education and training of professionals to develop their business in an active (Pereira, 2009), since "*the transition to the ASS is a complex process, demanding job that requires an effort to adapt the businesses and professionals by imposing substantial changes in the internal organization and procedures, and should therefore be prepared in advance*" (MFAF, 2007).

For all these requirements, it has expanded the footprint of the HEI on the polytechnic education, who particularly value the education of a professional nature, providing students with a practical application component of the knowledge and understanding the activities concrete of the respective professional profile (MCTES, 2006). However, one can not ignore the objective reality of these requirements in the training process imposed by Orders and Professional Associations, as well as, the need to consider the economic, financial and social differences of multiplicity of personal, social and family realities who attended to a specific HEI.

Given the conceptual framework presented, it is possible to identify the issue under research, specifically the analysis of post-secondary non-higher education on the accounting scientific area in terms of its ability to adapt to the education process and to the professional training and how education for work has become a global phenomenon, referred to as the "employability imperative" given its innovative and simplicity process that eliminate barriers to the progression of this type of training in HEIs. Methodologically, this research supports in norms, legislation, working papers, statistics and information issued by various entities in order to highlight the potentially attributed to post-secondary non-higher education in three major areas: training and education; employment and socio-professional integration; and sustainable local development, as a result of the assertion of higher education, in general, and, ESTG-IPG, in particular.

The legal regulation: Past and Present

In terms of legal regulation, it is worth noting the important contribution of the Law No. 5/73 (PR, 1973), which summarizes a basic principle of educational policy, to establish in subparagraph a) of the Base II that "*the State will seek to ensure all citizens access to several levels of education and culture of the world, without other distinction than that result from the ability and merits*". Thus, according to Decree-Law No. 402/73 (MEN, 1973), Portugal promotes the democratization of education that was been consolidated in the expansion and diversification of higher education "*to match the need to ensure social and economic development of the country, requiring an ever higher number of scientists, technicians and administrators with higher education, endowed with innovative critical capacity*".

The same Decree-Law (MEN, 1973) specifies, further, that "*the creation of new universities, polytechnics and higher schools fit in the context of the natural expansion of education and the development of Portuguese society*". The tradition of the State is to assume responsibility for creating higher education institutions that create and disseminate "projects that meet the needs of modernization and scientific and cultural development of the country", in accordance with Decree-Law No. 271/89 (ME, 1989). Therefore, in 1980, based on the regional strategy of spread the higher education institution has been created the Polytechnic Institute of Guarda (MEC, 1980b).

Given this reality, it is shown in paragraph 4 of Article 11 of Law No. 49/2005 (AR, 2005b) that polytechnic education is "*driven by a constant perspective of applied research and development, based on the understanding and solving concrete problems, aims to provide a solid cultural and technical higher level, developing the capacity for innovation and critical analysis and theoretical nature of scientific knowledge and practice and its applications for the pursuit of professional activities*".

The professional nature of the polytechnic education was already reflected in paragraph 2 of Article 5 of Decree-Law No. 427-B/77 (MEIC, 1977), when defines that "*courses contain a strong practical or pedagogical specialization, allow an immediate entry of their graduates in the activity for which they were formed*". In fact, the polytechnic education can not ignore its modernization effort, innovation and science creation, as well as, the professional dimension of their graduates, always demonstrated the focus on the professional training. In practical terms, the professional nature on Degrees is based on paragraph 1 of Article 7 of Law No. 62/2007 (AR, 2007) when it states that "*the polytechnic institutes and other polytechnic education institutions are high-level institutions that aim to create, transmit and disseminate the culture and*

the knowledge of professional nature, through the articulation of the study, teaching, oriented research and experimental development".

In relation to degrees, initially in the Basis XV of the Law No. 5/73 defines that the polytechnic institutes gave solely a bachelor's degree (PR, 1973). Later, in Article 13 of the Basic Law of the Education System, it is recommended that in higher education was conferred the Bachelor, Master and Doctor Degree (AR, 1986). In higher education, it can also be assigned degrees of specialized higher education, as well as, other certificates and diplomas for short courses. More recently, through the amendment introduced on the Basic Law of the Education System by paragraph 1 of Article 13 of Law No. 49/2005 (AR, 2005b), in higher education are awarded the degrees of Bachelor, Master and Doctor, integrated by cycles. In paragraph 2 of Article 7 of Law No. 62/2007 (AR, 2007) it was decided that "*polytechnic institutions confer the degrees of Master and Graduate, in law terms*".

In addition, the recent development of the Bologna Process has imposed a set of measures (MCIES, 2005), including the establishment of the European Credit Transfer System, which replaces the credit system establish in the Decree-Law No. 173/80 (MEC, 1980a). The new paradigm focuses on the student, giving him greater freedom in their training path and requiring him more responsibility. Caso (1993) considered that "*the main actor is the student*". This new system has the amount of work of an average student as unit of measure, which corresponds to the unit of credit. In this sense, it is allowed the accreditation in the school context, when the student approves courses or education units of a given Technological Specialisation Course with the same converge of bachelor degree.

In this context, the education and training process of higher education involves a significant volume of legislation, both at National level and European Union level, which is expected to produce results. More than legislation, without producing effects on the Society and that only improves the image of the Government in the short term; citizen's aims medium and long term changes that develop in a sustainable way the Society, in which operates.

The External Environment of the Polytechnic Institute of Guarda

The overall strategy of higher education policy should be based on decentralization of large urban centers to smaller urban centers with student profile. The lema is "*education and life with quality*", i.e., in large urban centers, concentrated of population, industry, commerce and services, with reduced "*quality of life*" and with hostile student profile to an evolution of the psycho-sociological of young people integrated in the Society of bad-fair, although, the cost and standard of living very high, students will enjoy a quiet life with a balanced and high-quality environment in small towns of the country (as Guarda). In this context, it is guaranteed the dynamics of local economies, the reduction of government expenditure, savings and household investment and, consequently, the sustained development of the country (Abreu et al., 2003).

In fact, the sustainable development of the Guarda region is induced by the IPG benefits, namely: to contribute to the quantitative and qualitative improvement of education (non-massified); to create new opportunities for access to higher education; to contain the exodus of the population young, candidate to the higher education, even reversing the flow of migration; to fix highly qualified scientific and technical body (supported on the expertise), needed for sustainable economic, social and cultural development of the region; to support services and industries already implemented and the creation of new ones, through the collaboration of teachers and technical staff as the use of laboratorial and documental structures; and to feasible implemented the social equipment as a result of new demographic dynamics.

Thus, it is fulfilled the constitutional principle establish in 1976 on the Constitution of Republic Portuguese, of equal opportunities to the access to higher education and education success, knowing that the State, in accordance with subparagraph d) of Article 74 of the Constitution of Republic Portuguese (AR, 2005a), "*should ensure that all citizens according to their abilities, access to the highest levels of education, scientific research and artistic creation*".

In this sense, the ESTG-IPG promotes several Technological Specialisation Courses that deals, on one hand, with willingness of individuals and businesses to engage in several professional activities in order to improve their quality of life. And, on other hand, provides specialized training in different professional areas which do not exist locally and without the IPG-ESTG remains the gap, thus it increases business competitiveness and the well-being of the Society.

Therefore, the promotion of local economies is, in the first instance, conducting by public and private investments, that allow infrastructures to enable them to harness their potential and leverage, in a balanced way, their wealth, particularly recovery of cultural heritage, environmental and traditional activities. In the second instance, by the settlement of people on rural areas, since local agents face real desertification problems and economic decline.

These problems were also felt by ESTG-IPG that operationalized the increase of the number of students through strategies of social responsibility in order to comply with the trilogy economic/social/environmental (Giró, 2002), to enable students to start their post-secondary non-higher education in the academic year 2007/2008, with the same human resources, physical and financial. Consistent with the commitments made and the perceived need to make higher education more attractive, these same students, in the academic year of 2010/2011, have completed the Accounting Degree and consequently the ESTG-IPG increased the number of graduates.

Thus, the success of the Accounting Technological Specialisation Course result from the technical and scientific capability of several teachers in the Accounting

and Finance scientific area of the Business and Economics Technical and Scientific Unit of the ESTG-IPG, because they are specialists who offer a comparative advantage, effective and dynamic, due to its scientific development and local capacity for innovation. In addition, these teachers have been integrated into larger training teams, involving professors of scientific areas of Languages and Cultures, Exact and Experimental Sciences and Informatics, which enlarge and solidify the training education.

It still miss, the procedure that allow the registration of the Accounting Technological Specialisation Course pursuit by the Decree-Law No. 88/2006 (MCTES, 2006) and it follows seven different and complementary phases, such as:

1st Phase - Reception on the ESTG-IPG of professional practices of partnerships and letters of intention, send by different enterprises and public entities, for the recruitment of accounting technical expert. This evidence leds to the appointment of a work team that conducted a study in cooperation with the enterprises and public entities, at regional and at national levels, which presents training proposal that allow the ESTG and IPG bodies decide in favour.

2nd Phase - Presentation of the request for the creation of the Accounting Technological Specialisation Course by President of the IPG to the General-Director of Higher Education, in accordance with the Article 36º.

3rd Phase - Preliminary review conducted by the General-Director of Higher Education, in accordance with paragraph 1 of the Article 37º.

4th Phase – Evaluation of the registration request made by the General-Director of Higher Education, in accordance with paragraph 2 of Article 37º.

5th Phase - Hearing of the Technical Commission of the General-Director of Higher Education, in accordance with subparagraph e) of Article 31º.

6th Phase – Final Decision of General-Director of Higher Education, in accordance with the Article 38º.

7th Phase - Publication on the 2nd Serie of the Official Journal of the Portuguese Government, in accordance with Article 39º. In this case study, the Order No. 10870/2008 as effect from November 24 of 2006 (MCTES, 2008).

After this procedure, the General-Director of Higher Education authorized the Accounting Technological Specialisation Course. So, the ESTG-IPG is allowed to educate professionals who, independently or as part of a team, plan, organize and evaluate activities within the management accounting and supervise the tasks of classifying and recording of accounting documents, and must acquire knowledge and skills to: plan and organize the implementation and execution of management accounting; organize business records to fiscal use; manage activities within the Administration Fiscal; coordinate the data collection necessary for regular reporting of economic and financial situation of enterprises, budgets, action plans and inventories; coordinate the classification and recording of accounting documents, depending on their content; develop the use of specific software; supervise work teams within the supply, production, personal, commercial, administrative and financial functions (MCTES, 2008).

In the defining moment of the training plan were considered in the training component for all technology specific knowledge areas and essential to the profession who have greater influence on the ability of professional performance, as establish on the Order of Chartered Accountants publish by the Notice No. 6060/2006 (OTOC, 2006). For example, the training units of Financial Accounting I and II correspond to the same course of the Accounting Degree, but with more contact hours. So, the Accounting Degree has 120 contact hours and, each one, of the Accounting Technological Specialisation Course has 180 hours. The same procedure was developed for the other training units, such as: Management Accounting with 90 hours and Taxation with 75 hours. All these training units exceed the minimum work hours, as well as, meet all the program content defined.

Discussion

For the Portuguese Government, the adaptability of the polytechnic education is not ignored in the future of their graduates, because the education and training process is supported on the professional practices, with a high sense of modernity, involving creative actions and ongoing research effort to respond to labour market needs.

To the local society, this is the most appropriate way of promoting local development in complementarity with other programms and initiatives of employment promotion, which includes entrepreneurship. So, the innovative nature of post-secondary non-higher education on the scientific area of accounting was, in the past, and is, at present, based in partnershipers, made it possible through intersectional cooperation of enterprises and public institutions.

For the ESTG-IPG, the research findings support the assertion that the post-secondary non-higher education on the scientific area of accounting is an area of enormous potential in the learning process of students, through its adaptability, its innovative nature and simplicity of processes.

For the students, the simplicity of the access process to higher education is encouraged by obtaining a technological specialization diploma after concluding all units of the post-secondary non-higher education. In the present context, the emergence of new social problems and the increase of the unemployment level (or the lack of employment) is a new dynamic that faces the trend of academic failure and school dropout.

For all stakeholders of higher education institutions, the future strategy recommended a greater involvement on several activities that improve the employability of their students and, therefore, reduce the risk of adverse behaviours and their learning process.

Bibliography

Abreu, R.M., David, M.F., Silveira, M.C. & Marques, P. (2003). Contributo para a Avaliação, Revisão e Consolidação da Legislação do Ensino Superior. In: Amaral, A. (ed). *Avaliação, Revisão e Consolidação da Legislação do Ensino Superior.* Matosinhos: Cipes, 46-50.

Agyemang, G. & Unerman, J. (1998). Personal skills development and first year undergraduate accounting education: a teaching note. *Accounting Education*, 7 (1), 87–92.

AR (1986). Lei nº 46/86. *Diário da República*, 14.10, I Série–A, 3067-3081.

AR (2005a). Lei Constitucional nº 1/2005 - Sétima revisão constitucional. *Diário da República*, 12.08, I Série–A, 4642-4686.

AR (2005b). Lei nº 49/2005. *Diário da República*, 30.08, I Série–A, 5122-5138.

AR (2007). Decreto-Lei nº 62/2007. *Diário da República*, 14.03, I Série–A, 1599-1602.

Birch, A. (1993). *The concepts and theories of modern democracy*. London: Routledge.

Birkett, W. (1993). *Competency Based Standards for Professional Accountants in Australia and New Zealand*. Sydney: Institute of Chartered Accountants in Australia and the New Zealand Society of Accountants.

Brown, R. & McCartney, S. (1995). Competence is not enough: meta-competence and accounting education. *Accounting Education*, 4 (1), 43–53.

Caso, L. (1993). Aplicación de estrategias alternativas en la enseñanza de la contabilidad. *Revista de la Facultad de Ciencias Económicas*, 45 (107/108), 87-112.

David, M.F. (1995). *Contributos para uma Estratégia de Desenvolvimento dos Recursos Humanos visando a Inovação e a Qualidade no Distrito da Guarda – O IPG (Dissertação de Mestrado)*. Covilhã: UBI.

De Lange, P., Jackling, B. & Gut, A. (2006). Accounting graduates' perceptions of skills emphasis in undergraduate courses: an investigation from two Victorian universities. *Accounting and Finance*, 46 (3), 365–386.
EC (2002). Regulamento (CE) nº 1606/2002. Diário Oficial, L 243, 11/09, 1-4.
EC (2003). Regulamento (CE) nº 1725/2003. Diário Oficial, L 261, 13/10, 1-420.

Foucault, M. (1984). *The use of pleasure: The history of sexuality* (R. Hurley, Trans.). London: Penguin.

Gammie, B., Gammie, E. & Cargill, E. (2002). Personal skills development in the accounting curriculum. *Accounting Education*, 11 (1), 63–78.

Giró, J. (2002). Globalización sostenible y responsabilidad social. *Dirección y Progreso*, 184, 58-60.

Hutchinson, P. & Fleischman, G. (2003). Professional certification opportunities for accountants. *CPA Journal*, 73 (1), 48–50.

Kim, T., Ghosh, B. & Meng, L. (1993). Selection criteria: perception gap between employers and accounting graduates. *Singapore Accountant*, 9 (1), 32–33.

LaFrancois, H. (1992). The marketing of an accounting graduate: characteristics most desired by CPA firms. *Journal of Education for Business*, 67 (2), 206–209.

Luthardt, U. & Zimmermann, J. (2009) A European view on the legitimacy of accounting procedures: Towards a deliberative-accountability framework for analysis. *Research in Accounting Regulation,* 21 (1), 79–88.

Mathews, R., Jackson, M. & Brown, P. (1990). *Accounting in Higher Education: Report of the Review of the Accounting Discipline in Higher Education: Volume 1*. Canberra: Australian Government.

Mautz, R. (1963). Accounting as a social science. Accounting Review, 38 (2), 317–25.
MCIES (2005). *Processo de Bolonha*. Lisboa: MCIES.

MCTES (2006). Decreto-Lei nº 88/2006. *Diário da República*, 23.05, I Série–A, 3474-3483.

MCTES (2008). Despacho nº 10870/2008. *Diário da República*, 14.04, II Série, 16906.

ME (1989). Decreto-Lei nº 271/89. *Diário da República,* I Série, 19.08, 2249-3405.

ME (1999). Decreto-Lei nº 393-B/99. *Diário da República*, I Série–A, 02.10, 6736 (6)-6736 (9).

MEC (1980a). Decreto-Lei nº 173/80. *Diário da República*, I Série, 29.05, 125-1257.

MEC (1980b). Decreto-Lei nº 303/80. *Diário da República*, I Série, 16.08, 2216(2).

MEIC (1977). Decreto-Lei nº 427-B/77. *Diário da República*, I Série, 14.10, 2492(5)-2492(6).

MEN (1973). Decreto-Lei nº 402/73. *Diário da República*, I Série, 11.08, 1401-1406.

MFAP (2007). *Orçamento de Estado para 2008: Relatório*. Lisboa: MFAP.

Mohamed, E. & Lashine, S. (2003). Accounting knowledge and skills and the challenges of a global business environment. *Managerial Finance*, 29 (1), 3–16.

MTSS (2009). Portaria nº 782/2009. *Diário da República*, I Série, 23.07, 4776-4778.

OTOC (2006). Anuncio nº 6060/2006, Aprova o Regulamento de Estágio da CTOC. Lisboa: OTOC.

Pereira, N. (2009). *Cursos de Especialización Tecnológica en Portugal. Un Nuevo Modelo de Formación Pos-Secundaria No Superior para la Cualificación de la Población Portuguesa.* Tesis Doctoral. Badajoz: Universidad de Extremadura.

PR (1973). Lei nº 5/73. *Diário da República*, I Série, 25.07, 1315-1321.
Richardson, A. (2002). A Canadian Accounting Perspectives Forum on the Future of Accounting Education: Editorial. CPA *Journal*, 1 (1), 53–104.

Usoff, C. & Feldmann, D. (1998). Accounting students' perceptions of important skills for career success. *Journal of Education for Business*, 73 (2), 215–220.

THE EXPERIENCE OF SHORT CYCLE HIGHER EDUCATION FORMATION IN THE BRITISH SYSTEM AND ITS POSSIBLE INFLUENCE IN THE PORTUGUESE SYSTEM

Ricardo Vardasca

Abstract

The Short Cycle Higher Education is present in the British education system for 60 years, has been reviewed in 2004, from that revision it had been graded as level 5 qualification offering three different levels of courses. Each of that different level of courses has different entry requirements and mode of operation. This paper describes that requirements and mode of operation, addresses the current problems in the similar courses in Portugal and suggests solutions based in the British experience that so well worked in the Bologna agreement for the Higher Education in Europe.

Keywords
Higher Education, Portugal, Qualifications Framework, Short Cycle, United Kingdom

The concept of short cycle higher education emerged in Britain in the mid 50's, allowing students to have a vocationally-focused qualification. It was a qualification for students that had attended or completed high school, however do not have the requirements or did not want to pursuit for other higher education qualifications such as a Bachelor degree. In the beginning two options were offered, the Higher National Certificate (HNC) and Higher National Diploma (HND) (Davy, 2011).

A new type of Short Cycle Higher Education (SCHE) in the British education system was introduced in 2001, the Foundation degree, which was offered by universities in partnership with higher education colleges and further education colleges. It could be delivered in the workplace, via Internet or by distance learning (Cremonini, 2010).

In 2004 the National Qualifications Framework (NFQ), body that regulates the credits transfer between different qualifications in United Kingdom, has defined three levels of SCHE accrediting them as level 5 in the qualifications grading scale (NFQ, 2011).

In order to the students get access to SCHE courses they have to complete certain compulsory requirements such as a minimum final mark of 'C' in English and Math subjects. In addiction they must have minimum number of General Certificate of Secondary Education (GCSE), which corresponds to the core subjects accomplished in the secondary school. In order to gain access to HNC courses 3 GCSE's are required and for the Foundation and HND 5 GCSE's. Other requirement is the minimal credits

of Universities and College Admissions Service (UCAS), which is an organism that manages the access contest to Higher Education in UK. The table 1 presents the average UCAS credits per grade obtained in the cores subject of secondary education, which is used to determine the UCAS credits per student the is contesting for access to higher education(NFQ, 2011).

Obtained Grade	Correspondent UCAS Credits
A	60
B	50
C	40
D	30
E	20

Table 1. Average correspondence between Obtained grades in GCSE and UCAS credits (UCAS, 2011).

The Foundation degree is a vocational qualification, that provides a secondary education accomplishment for the students attending and completing it without having the qualification in the beginning. Has duration of one year in full-time and two years in a part-time based study. It allows the progress to a HND or a Bachelor degree in the same area of study based in the available positions and the results obtained, without granting any modules accreditation (NFQ, 2011).

The HNC courses have a minimal entry requirement of 80 to 100 UCAS credits, one year duration on a full time basis and two years in a part-time study. It allows the progress to a HND or a Bachelor degree in the same area of study, based in the available positions and the results obtained, granting accreditation to its first year. It also permits access to a professional placement or internship (NFQ, 2011).

The HND courses have a minimal entry requirement of 100 to 140 UCAS credits, two years duration on a full time basis and three years in a part-time study. It allows the progress to a Bachelor degree in the same area of study, based in the available positions and the results obtained, granting accreditation to its first two years. It also permits access to a professional placement or internship (NFQ, 2011).

Normally the classes are formed by a minimum of 20 and a maximum of 24 students enforcing what is recommended by the Quality Assurance in Higher Education regulations (Davy, 2011). The foundations degrees have a rigid structure of modules but the students from different areas of study can be in the same classes of others in the common modules. The HNC and HND courses have compulsory modules and optional modules, these students are normally integrated with bachelor degrees students in the same areas of study in the same modules that they can have accreditation. It will facilitate their progress and motivation to pursue for higher levels of higher education.

Normally the theoretical lectures of the modules in all three levels of SCHE are given by lecturers having a doctoral or master degree. The practical lectures can be given by any teaching member (Lecturers or Research Students) of the departments. The lectures are integrated in the distribution of teaching hours.

In 2006 the Bologna agreement was implemented in Portugal revolutionizing the higher education system, contributing to an easier way of recognizing qualifications among different institution in different countries. This system was based on the British System of Higher Education.

With the introduction of the now called SCHE degrees in Portugal some problems had aroused such as: difficulties in recruiting teaching staff, difficulties in the management of timetables of classes and classrooms, poor flexibility in the courses offer and difficulty in quality assurance. To address these problems the following suggestions are presented:

- Integrate the modules that will get accreditation in a higher level of qualification on the teaching service distribution per departments.
- Include in the same classes the SCHE students and the Bachelor students in the modules that will get accreditation in a higher level of qualification.
- Establish the requirements for entry into SCHE courses, specifically for Portuguese and Math subjects.
- Creation of compulsory and optional modules in the SCHE courses, to make them more flexible.
- Assure the recommended number of 20 to 24 students per class.
- Impose two levels of SCHE courses in order to provide more offer to the students.
- Raise the quality assurance.

Bibliography

DAVY N. (2011) Embedding Short Cycle HE in the HE System – Links between HE and VET: The English Experience. EURASHE 2011. Budapest (Hungary). 20-21 January 2011.

CREMONINI L. (2010) short-cycle higher education: an international review. At: http://www.wissenschaftsmanagement-online.de/converis/artikel/1282# Accessed July 31, 2011.

NFQ (2011) The National Qualifications Framework website. At:http://www.direct.gov.uk/en/EducationAndLearning/QualificationsExplained Accessed July 31, 2011.

UCAS (2011) The Universities and College Admissions Service Website. At: http://www.ucas.com Accessed July 31, 2011.

THE ROLE OF TECHNOLOGICAL SPECIALIZATION COURSES ON UNDERGRADUATE STUDENTS SUCCESS. POSITION PAPER

Filipe Pinto

Abstract

One of the most important student's issues regarding technological specialization courses is the possibility to allow their continuity to under graduation courses. In spite of this recent phenomenon, throughout this work I´ll develop a particular position perspective, regarding students' success evaluation from their specialization course to the under graduation course.

Introduction

In Portugal education system all high school student can apply to join to TSC course, whenever they had completed some requirements levels of high school education.

One of the most interesting challenges to technological specialization courses (TSC) students is their possibility to forward their studies to under graduation courses. Some discussion regarding their credibility, capacity and success and has came across.

To a new under graduated student it is expected to held technical and scientific skills to analyze, to formulate a solution and solve new and different problems. Afterward Bologna agreement such kinds of skills have being impaired, due courses length and curricula reduction. Moreover such time reduction in courses length, avoid some experience exchange and interchange experiences between students and also to have more opportunities that universities and polytechnics could provide.

This work focuses both TSC courses and their students, in order to state an idea and a position as presented in the next section. Then, general TSC courses characteristics are analyzed, following a case study based on IMSN course. On the section 5 students results are presented and discussed on section 6. This paper ends with conclusion drawn on section 7.

Motivation: discussion issue

With the introduction of the Bologna model the majority of undergraduate students need to continue their studies. On the other side, TSC courses to appear as one solution for those students that need to have an opportunity to get a vacancy in higher education system.

Thereafter some course editions and some experience as course director it is now possible to defend that, TSC students have proper and good conditions to get success whenever they apply for higher education course. Such success is very well justified by TSC course structure and paradigm.

Technological Specialization Courses

Regarding Ministry of Science, Technology and Higher Education, TSC courses are characterized by "a high-level technical training knowledge; achievements that include qualifications and higher-level skills; in spite of it doesn't require, general specific domain field in scientific bases in some concerned areas, allow to acquire skills and knowledge, by which, independently or self-responsibility based design, administration and / or management "(MCTES, 2006)[1].

Generally of TSC post-secondary education course main characteristics are presented and defined by:

- High level of technical training;
- Pragmatic oriented curricula contexts
- Results in a qualification that includes top-level oriented knowledge;
- Allows contact and learning content "university"
- Allows the acquisition of skills, knowledge, and also some professional valences identical to those obtained by higher education

Case Study: Installation and maintenance of systems and networks

Installation and maintenance of systems and networks (IMSN) it is an informatics TSC course deign to provide to their students skill to implement, manage and explore systems networks. This TSC course is one of the most active courses ministered by For. CET at Polytechnic Institute of Leiria. It has being taught since 2007.

IMSN curriculum level

IMSN course architecture, regarding classes' scientific origin, includes three different levels: basic skills; soft skills (generic field competences) and expertise.

At basic skills classes students are exposed to a fundamental basic set of knowledge needed to pursuit their studies, such as, math, literature or foreign language. Besides, some organizational concepts are presented improving their future labor market integration.

At soft skills classes, students need to achieve a broad knowledge about different and important subjects such as, programming units, project methodologies or system network concepts among others.

Finally throughout expertise level classes' students are required to learn and to apply specific and oriented subjects regarding IMSN course. Moreover, by the end of curricular classes students are evaluated at general project development. Such project classes are provided in order to integrate all course knowledge taught.

IMSN curriculum analysis

Besides previous classification, IMSN course, similarly to other TSC courses, provide to their students an active practical and outdoor opportunities to learn. Classes at IMSN course are broad characterized by:

- 50% regular classroom knowledge, throughout theory and practical class organization;
- 15% final project integrating skills, through classes with different teachers at different stages of project development;
- 35% practical work in real environment by means an outdoor experience at a company. During this period, students and required to develop by themselves specific work supervised by company staff and a teacher.

With such a structure is expected that students will be motivated to learn and apply, guided by practical results and expectations.

Faculty staff

IMSN faculty staff is majority formed higher education teachers and specialists who offer a comparative advantage, effective and dynamic, due to its scientific development and local capacity for innovation. This group of teachers is well motivated to work at different approaches, academic and scientific.

Since, there is different students from different origins, at academic level, teachers are aware about students profile and their limitations. Simultaneously and at the same time, at a scientific level, teachers are concerned about the way students learn. That is, teachers at the beginning of semester make their class objectives, and develop different strategies in order to get a homogeny group by the end of semester.

Thus, generally teaching contents have to take in account some issues like:

- Pragmatic, through a learning process optimization, towards to the class and students learn objectives;
- Oriented case studies, by means of practical and demonstrative cases, through hands-on classes and sessions;
- Focused on labor market throughout some company and labor market examples exploration.

[1] MCTES (2006). Decreto-Lei nº 88/2006. Diário da República, 23.05, I Série–A, 3474-3483.

Available resources

One of the most important promises of TSC courses are their pragmatic and practical contents. Therefore some resources are critical to students' achievements success. Since IMSN has practice issues as main characteristic, it is necessary to provide a set of useful resources such as infra-structures and domain resources.

As infra-structures resources it is included, room laboratories, different type of computers, systems network routers, hubs and many other type of physical or electronic devices.

As domain resources, it concerns all creation of projects resources, that is, in order to provide students to the ability of projects development it is necessary to get different projects specifications available, such as, buildings plants, systems architecture drivers, among many other different requirements.

Environment

The main IMSN environment, as in other IPL TSC courses are mainly characterized by academy and higher education characteristics. IMSN students along the time become familiar with higher education colleges and their experiences.

Moreover, since IMSN course is mainly oriented for a pragmatic knowledge and skills, it has an environment broadly characterized by companies, public organizations and research centers. Such kind of contacts and experiences are established along course development, sometimes through some public presentations or practical works promoted by external entities.

By the end of the course, students would take a learning process besides the scientific and academic field- they will learn an integrated learning experience.

Students results

The success of the IMSN specialization course students results from the learning approach, but also, from faculty staff.

IMSN holds a very well established set of resources (human, infra-structure and logistic) that is showed on students profile, that had finished with success their studies. Take in account 2009-2011 IMSN course edition, a brief analyze is made.

As depicted on figure 1, 83% of IMSN had finished their course. From overall course, 66% had applied for Polytechnic Institute of Leiria, higher education course and 52% had successfully got in. Such results were possible thereafter some political increase in IPL courses vacancy philosophy. In fact there was an effective change in the way these students are allowed to apply to IPL courses.

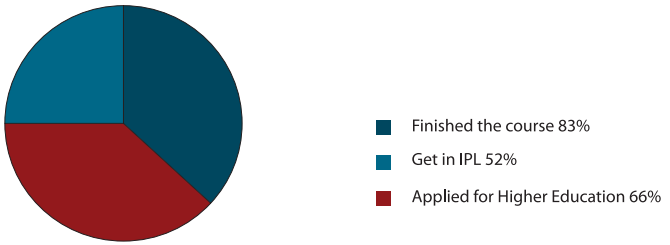


Figura 1. IMSN students results

Regarding other previous IMSN editions it was founded some interesting results, regarding students' success at Computer Science Engineering. From 12 former IMSN students, all of them had concluded or are on the way to conclude with success their studies. From these students there are different experiences: some had got interesting job opportunities and others had continued their studies integrating some master programs.

In common all of them designate their IMSN course background and experience as the main issue to their success.

Discussion

In spite of early results based on few editions, it is possible to state that IMSN course philosophy is very well defined in terms of :

- Contents: a set of subjects that covers all theory and practice regarding computer science networks, in terms of definition and management;
- Practice oriented subjects: nevertheless some theory, almost all classes have in background some practical demonstrations and experiences.
- Paradigm: practical contents in practical approach for a practical world;
- Professional: since these students are aware and motivated for practical issues, most of the approaches are developed in terms of professional demonstrative case studies.

Therefore it is also possible to claim to IMSN students three different level of personal development:

- Academic: through subjects learning process
- Personal: through higher education environment day by day experiences
- Professional: through practice oriented at the final of the course complemented by means of the internship opportunity.

Conclusions

We live at a competitive society with challenges beyond regular skills or regular course programs. Students, professionals or any other working in competitive environment are exposed to a XXI century professional challenge: versatility.

At this context, since they need to develop different competences at different levels and contexts, a student of TSC course has a profile far beyond the regular academic (students that had made their secondary school).

Thus, regarding TSC students profile they are better prepared for new challenges, probably unlike undergraduate students. At undergraduate courses, these students may be better receptive than other students, since they already got their academic profile, practical and professional experience. Moreover, such students will be better aware and focused on practical issues regarding labor market and professional terms. Besides, TSC students would need additional training as many others since they already took an internship.

POLYTECHNIC INSTITUTE OF LEIRIA'S TECHNOLOGICAL SPECIALIZATION COURSES UNDER COMPETENCE BASED TRAINING AND LEARNING MODELS: A LEONARDO DA VINCI PROJECT STUDY

Antónia Barreto . Filipe Santos

Abstract

The Polytechnic Institute of Leiria has been participating since 2009 in project TrainFrame, a Leonardo da Vinci project where 12 institutions from 9 countries aim to create a competence based training and learning model for vocational training contexts. In this model the partners aim to take into account the differences of the partner institutions and the Polytechnic Institute of Leiria participates in this project with their Technological Specialization Courses.

In this article we present some results of the Portuguese partnership concerning its Technological Specialization Courses concerning the first phase of the project, aimed at knowing the conceptions of both trainers and trainees of these courses on competence based learning and training (CBL/CBT) and how well the trainers used them in their practices. The results obtained suggest that the Technological Specialization Courses of the Polytechnic Institute of Leiria meet these vocational training methodologies and that both trainers and trainees know their objectives and roles in the course.

Keywords

Competence Based Training, Competence Based Learning,

Introduction

The Polytechnic Institute of Leiria (IPL) has been participating since 2009 in an European Leonardo da Vinci project – project TrainFrame – where 12 institutions from 9 countries aim to better know their practices of Competence Based Training and Learning (CBT/CBL). The goal of this project is, and based on current theoretical framework on CBT/CBL, to propose a model that take into account the institutional perspectives, figuring how their differences (as institutional size, geographical location, financial stand, administrative capacity, services and technical equipment) influence training and learning and how these differences can be framed in a new framework (TrainFrame, 2010). This project also aims at developing tools and instruments that allow partners to study their institutions.

The Polytechnic Institute of Leiria entered this project through its Technological Specialization Courses (CET - *Cursos de Especialização Tecnológica*). In

one of the first stages of the project, two questionnaires have been elaborated to be passed on the trainers and trainees to know the training/learning context of each institution concerning courses that adopt CBT/CBL methodologies. Therefore, IPL passed this questionnaire (available online) to CET trainers and trainees. 19 trainers and 34 trainees answered these questionnaires.

We will show, in the next sections, some of the questions made, answers we got and an interpretation of the results.

CET courses and the development of competences: the trainer perspective

Nineteen CET trainers answered the questionnaire where their opinion was asked on several dimensions on their teaching practice. In a first dimension we aimed to know their vision on the work based on competences and its implementation in the CET courses. We began by asking them to give us their ideas on competence based education. The results obtained are shown in table 1.

Which of the descriptions below fits best to your idea of Competence Based Education?	Nº	%
Knowledge, Skills and Attitude are integrated elements of the learning process and assessment.	12	63%
There is a permanent reflection on the profession and the professional attitude.	12	63%
Learning-, career-and citizenship competences of the participants are stimulated.	12	63%
The participant is the main focal point of education.	11	58%
Learning in and learning from practice is the starting point of the education program.	11	58%
The (content) supervision is varied and fine-tuned on the learning requirements of the participants.	10	53%
Participants are assessed continuously throughout the learning process.	8	42%
Learning activities take place in different meaningful practical situations.	7	37%
The curriculum is constructed in such a way that the 'self-guiding' of participants increases continuously.	6	32%
Core Tasks, Work Processes & Competences are the starting point for the development of the educational program.	6	32%
Other	2	11%

Table 1

We also wanted, under this scope, to know "What kind of 'educational concept' is leading in your organization / in your way of teaching?". The results obtained are show in figure 1.

Figure 1

These answers seem to indicate that trainers are familiar with the theoretical concepts/ framework of the CET courses (D.R, 2006).

In one other dimension, we tried to know the kind of teaching elements/ methods of instructions/styles of learning the trainees used. The results obtained are show in figure 2.

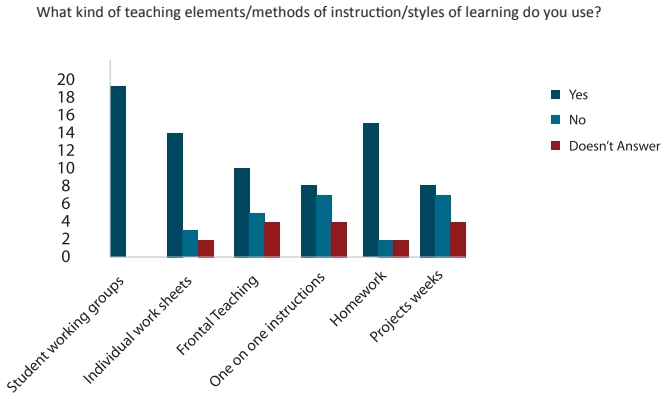


Figure 2

Figure 2 shows us that there is individual and (collaborative) group work (answer given by all trainers). We also see an importance given to projects, under a process development methodology, which points to the development of learning competences. We also emphasize one-to-one instruction (tutorial) methodology answered by almost a half of the trainer's sample.

Next we tried to know the degrees of freedom given to the trainees on several parameters. These parameters and modal values of the answers are given in table 2. Do students have freedom of choice concerning the following topics:

Do students have freedom of choice concerning the following topics: 1 = No freedom of choice, 5 = complete freedom of choice	Mode (19 questionnaires)
The decision of learning targets	1
The choice of place of education (in school/ in company)	1
The choice of learning environment (digital/contact hours/independent work)	3
The choice of guiding and assessment (shape/point in time)	2

Table 2

These results can be explained by the fact that CET courses are inside a national legislative framework that defines a number of classes, practical and theoretical hours, curse objectives, etc., and thus don't depend on the trainers or trainees. Nevertheless, the trainer has freedom in the definition of the learning environment and assessment methodology and we see in Table 2 that the trainer adopt and pass to students that freedom.

We also tried to know if the 'freedom of choice' changes during the course of the educational program. The answers given are indicated in Figure 3.

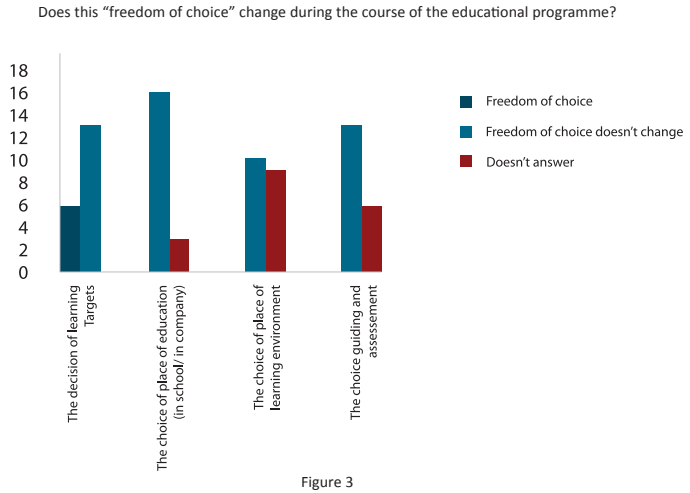


Figure 3

This question is raised on the assumption that through the course learning competences are developed that give trainees more responsibility and autonomy in the management of their learning. This concept is clearly associated with flexibility. Still, and by the specificity of the CET courses, the flexibility margin in some parameters is not changed. CET courses, by their legislative framework are not adapted to the client.

We then tried to know the kinds of evaluation that the trainers do. The answers are show in figure 4.

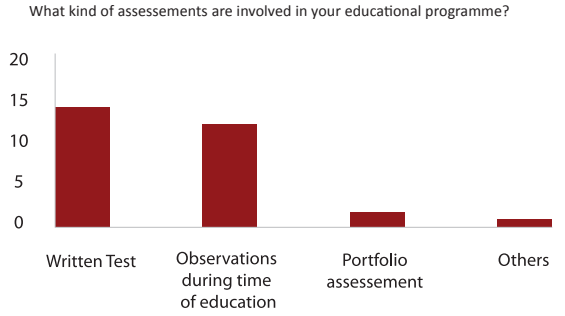


Figure 4

We consider that assessment by portfolio is the one that more clearly answers to the demands of CBT/CBL. As Figure 4 show, portfolios are not very used in CET courses. Still, trainers give great importance to observations, which is, effectively, a common evaluation procedure in labor context. Yes, we see that the most used technique is the written test which is the one that is least adequate to a CBL/CBT model.

On the period that the trainer evaluates the knowledge, skills and attitudes of the trainees, trainers answer as shown in figure 5.

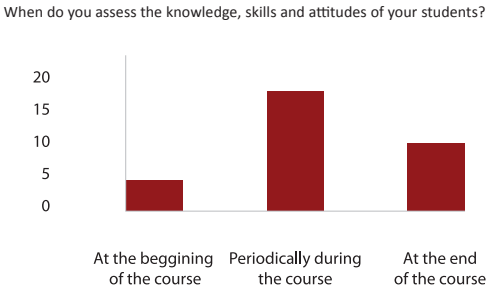


Figure 5

We see that all trainers assess during the course but only some assess at the beginning. In a process of development of competences, trainers should look to early diagnose competences to work on their evolution.

The partnership also tried to obtain other indicators, although not in such an exhaustive way, that would allow knowing the relation between the trainer and the corporate world. With this the partnership aimed to know if market needs and the answers provided by the training institutions to those needs are synchronized. The question and answers are in figure 6.

Figure 6

All trainers confirm a relation with the labor market, which allow us to affirm that there is a concern with the constant update of competences demanded by that labor market and the ones offered by CET courses of IPL.

CET courses and the development of competences: the trainee perspective

Concerning the questionnaires build for the trainees, we got answer from 34 of our students from several courses ("Administrative Practices and Public Relations", "Conservation and Restoration of Buildings" and "Technic of Social Intervention and Drug addiction". This group constitutes a convenience sample.

We began by inquiring trainees' opinion concerning competences, profession and pertinence of CET courses. The answers to one of the questions, "Are you aware of the competences that are relevant / necessary in your vocational profession / or in society in general" are indicated in figure 7.

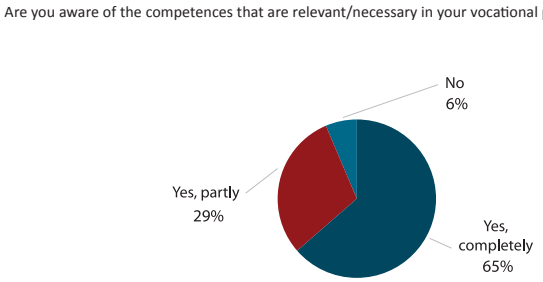


Figure 7

Only 2 trainees (6% of the sample) said that they were no aware of the relevant competences for their professional competences which lead us to conclude that, under a model of learning by competences, there must have been a pertinent strategy of disclosure of competences connected to the profession. Or, on the other side, as CET courses are frequented by many students that already work in the course area, we may assume that such awareness may already be acquired.

When questioned on if the majority of objectives and program content are relevant to their work in the future, most of them also recognize it. This answer may be interpreted as existing an adequacy on contents and methodologies that take trainees consider relevant apprenticeships.

Next, and when questioned on how well they knew the course learning objectives, we got also positive answers, as seen in figure 8. This means that has been a concern of the coordination of the course on communication with students and that it has been successful.

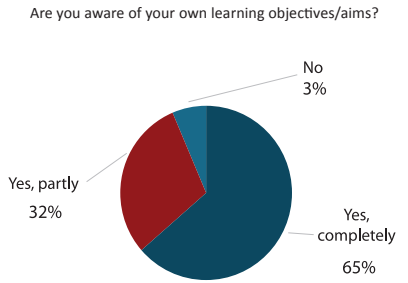


Figure 8

When questioned on the relevance of the objectives and contents for their future work, trainees also responded affirmatively, as shown in figure 9, which allows us also to deduce that the course is coherently organized to allow the acquisition of the necessary competences.

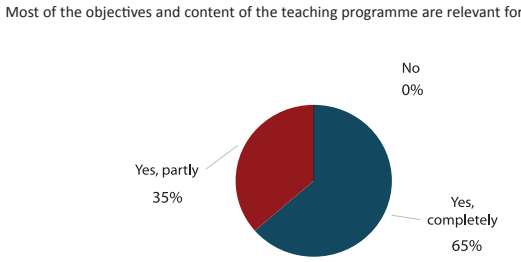


Figure 9

We then aimed at knowing the course coherence on the professional competences. When questioned about if the contents of the classes are related to the course learning objectives, most trainees recognize this relation, as shown in figure 10.

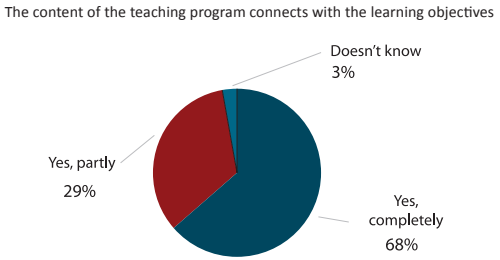


Figure 10

Equally, when asked on the relation of the assessment and what was learnt, trainees recognize the adequacy of what was taught and what was assessed, as show in figure 11. This reinforces the internal coherence of these courses.

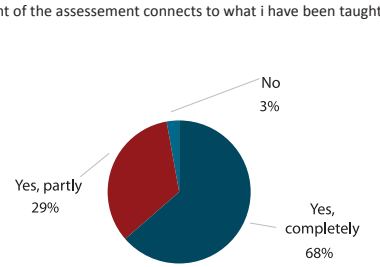


Figure 11

Every trainee (100%) recognized that there is a variety of learning methodologies. Yes, there are some that are more predominant, as show in figure 12. This way, we see that methodologies such as role play are not very used and the same happens with tutorial work. Work and individual work are indicated by 100% of the trainees.

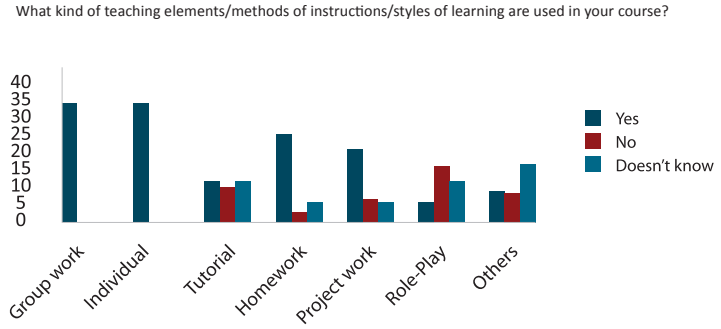


Figure 12

We also aimed to know the trainer-trainee relation. By analyzing the results of figures 13, 14 and 15, we see that there is a high level of satisfaction concerning trainer support and time they make available to that support. Every trainee also said that there is a concern by the trainer in adapting the contents to the individual profile of the trainer.

I am content about the supervision and coaching of the teacher

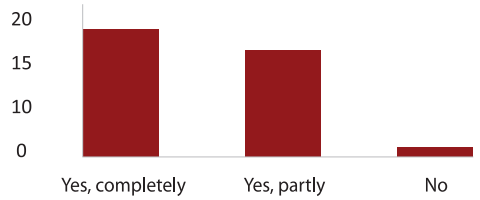


Figure 13

The amount of contact between teacher and students is sufficient

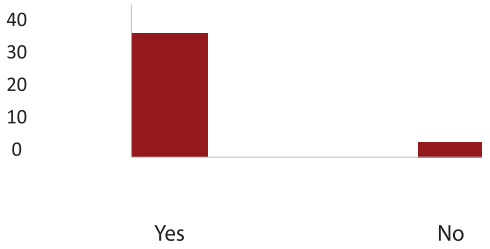


Figure 14

The teaching content is adjusted to individual needs

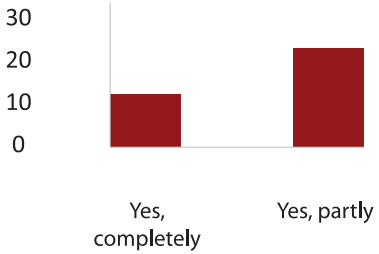


Figure 15

At last, we wanted to know if students knew their role as trainees. When questioned on their role concerning the course objectives, trainees answered affirmatively, as show in figure 16. This led us to conclude that trainees assume themselves as active participants in the management of their apprenticeship.

Are you aware of your own learning objectives/aims?

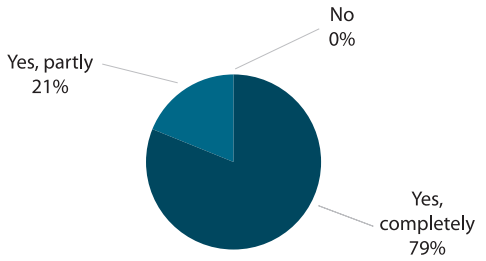


Figure 16

Final considerations

Given the wide scope of the TrainFrame project, where 11 partners from 9 countries participated, and organizations of different sizes and cultures, the questionnaires were designed in a very comprehensive way to be applied in heterogeneous vocational training contexts. Therefore, the authors are aware that some of the domains could be more deepened in the national context. Yet, these questionnaires allow us an interpretative reading of a non-representative sample of the CET universe population on their involvement in the work by competences. For reasons that are related to the application of the questionnaires, we didn't match trainers and trainees of the same courses. But, for one side, if this procedure brings us methodological limitations, for other side, and as most opinions go into the same conclusions, we may put the hypothesis that there is an effective relation between the CET courses and work by competences.

Bibliography

TrainFrame (2010). TrainFrame Introduction. Accessed 8th of June, 2011 in http://trainframe.edunetbg.com/.

D.R. (2006). Decreto-Lei nº 88/2006 de 23 de Maio . Diário Da República—I Série-A, Nº 99, 23 de Maio de 2006. Accessed 8th of June, 2011 in

http://www.dges.mctes.pt/NR/rdonlyres/C2C150AD-A1D5-4B20-8A8D-1B5A6258E8CF/1123/DL882006.pdf

VOCATIONAL TRAINING AND EMPLOYABILITY - FORCET CASE IN PORTUGAL AND SCHOOLS IN THE STYRIA REGION IN AUSTRIA

José Machado

Abstract

The Technological Specialization Courses (SCHE) must have a practical component, called in the Portuguese education system “training in the workplace”, which derives from the specificity of the industry or services related to the concerned course. This component should help to ensure that graduates can then play with greater proficiency specific functions in the institutions or companies in the area of their course. On the other hand, it is a close contact between the learner and the working life, being one of its objectives to increase the rate of employability.

It is interesting to analyze how employers and education officials set out the various modalities, liaison and contact between the general and technical education and working life. In this communication we will also focus particularly on the cases of Forcet and on the Austrian schools of the region of Styria.

Keywords
vocational, sche, forcet, Austria, teaching

Introduction

Training and practical training which in the Forcet courses, covered by the Portuguese legislation, are called “Training in the Workplace”, involve the technique and the performance specificity of each profession functions and for this reason, it is of great importance. Employers seek individuals who possess skills in the know-how and who are an asset to their companies or institutions. This knowledge must be acquired by the trainers inside the companies, in the school or both, but it must be questioned and balanced as well.

The vocational training presents several solutions to frame this symbiosis between academic and practical branch. In this context we should understand practical by the developed knowledge within the company or institution. These solutions are often different from country to country and sometimes in the same country different solutions were experienced.

Despite having some differences, these vocational training modalities maintain the practical training and the practice in the companies in common. With more or less hours of labor context, all the courses include it in its curriculum. That’s

why in Portugal, in the Technological Specialization Courses (SCHE), the completion of an internship in a work context is compulsory, allowing trainees to contact with the working world and put into practice the knowledge acquired during the academic phase of the course itself, in order to facilitate the trainees integration in a company or institution.

It is relevant to analyze these ways of looking the trainees' connection to the labor world which may contribute for an index of employability increasingly effective. In this context we will address two realities, the one from the Forcet, organic unity of the Polytechnic Institute of Leiria (IPL) which aims at the post-secondary training in its higher schools and also from other entities having a specific partnership contract (IPL, 2011) and from Austrian schools from Styria region that we got to know in 2008, throughout a study visit, organized by CEDEFOP, European Center for the Development of Vocational Training under the theme "The dual vocational training system in Austria, Vocational schools and the work in context". During the staying we had the opportunity to visit the schools of Bad Radkersburg (assistants to supermarkets and food departments), Bad Gleichenberg (hotels), Arnfels (cars technitians), Gleinstätten (Butchers, bakers and garment making), Eibiswald (electricians and electronic technicians). Visits were also made to the companies Magna Steyr (production car) and Odörfer (locks and building material).

This experience allowed us to contact with other ways of organizing the vocational training, adding that the participants of the study were from countries such as Turkey, Finland, Hungary, Norway, Spain, England and Cyprus. The urge to put young people in the labor market, through an effective and practical knowledge of their future profession, was common to all education systems presented.

Learning for employment

Training in the workplace is common to both forms of vocational education that we will present here. This practical and effective training makes trainees the future workers more efficient by increasing their knowledge either intellectual, or even physical, by increasing their human capital (Becker, 1975).

Recognizing the importance of such training in 2007, the OECD has launched the "Learning for Jobs" program to enable countries to adapt their system of vocational education to labor market requirements (Hoeckel, 2010). Students look for advice on their professional future among parents, family members, friends and also, but not in the first place, among school psychologists and school guidance. Today, some countries have created the position of counselor, those having the task of explaining and advising students on employment that best suits them. These professional counselors must have a deep knowledge of the labor market, the industrial structures and of the knowledge required so that they can effectively help the students (Kuczera, 2010). Learning and training in the workplace also serve this goal by allowing students to have an experience in real time and thus they be one aware of the difficulties and contingencies inside the chosen profession.

There are jobs that require skills at the level of problem solving to solve situations that were not previewed, others, which require preparation to extract information or to communicate effectively. Only practice and training can enable a true awareness of what will be the day to day in their workplace.

On the other hand, students with theoretical and practical good knowledge reveal difficulties of integration in a work team or the reverse situation, when left alone they manifest difficulties of performance accusing the weight of responsibility. The problems of integrating young people in jobs may be different from those mentioned above and they can be also relate to created expectations (Vivas, 2009; Luyckx et al, 2011) and, therefore, it becomes necessary besides providing an experience in work context, that the part of the training is planned. Some authors call this the WIL (work-integrated learning) (Freudenberg et al, 2010). On this part of the vocational courses developed in the companies it should be noted that it is required an open mind of the trainees, flexibility, adaptability and capacity for analysis (Guggenheim, 1999).

The training cannot be viewed in isolation. It must be enclosed in the context it will be realized both from the social point of view, and the place it will occur.

Vocational education in Portugal

According to Rodrigues (2009) who used the Eurydice as a source in Europe, there are 54.4% of students attending vocational education. Also according to data released by the same author, Portugal occupies the 25th position among 30 countries with 27.9% of students attending such schools. Austria occupies the 5th position with 71.1%. It is noted that only 13 of the thirty countries have averages below 50% attendance of students. By analyzing these figures we can infer that Portugal, unlike its European partners has much to do in this type of education.

This contrasts with the number of workers which, according to Mota et al. (1985), should be trained, around 40,000 and adding to this number more 10,000 from middle management, to maintain the same level as in Europe.

The vocational courses began in 83/84 with 395 students divided into many areas. The courses had one year duration for the theoretical subjects and six months for the practical context. The following year, this number increased to 1000 students.

These courses intended that students should acquire specific skills of various professions in order to meet the needs of local and regional work (Mota et al., 1985). In collaboration with the Institute of Employment and Vocational Training these courses began having two components, one general and another technique, respectively with 16 and 24 hours weekly. This type of courses began in 1980 having

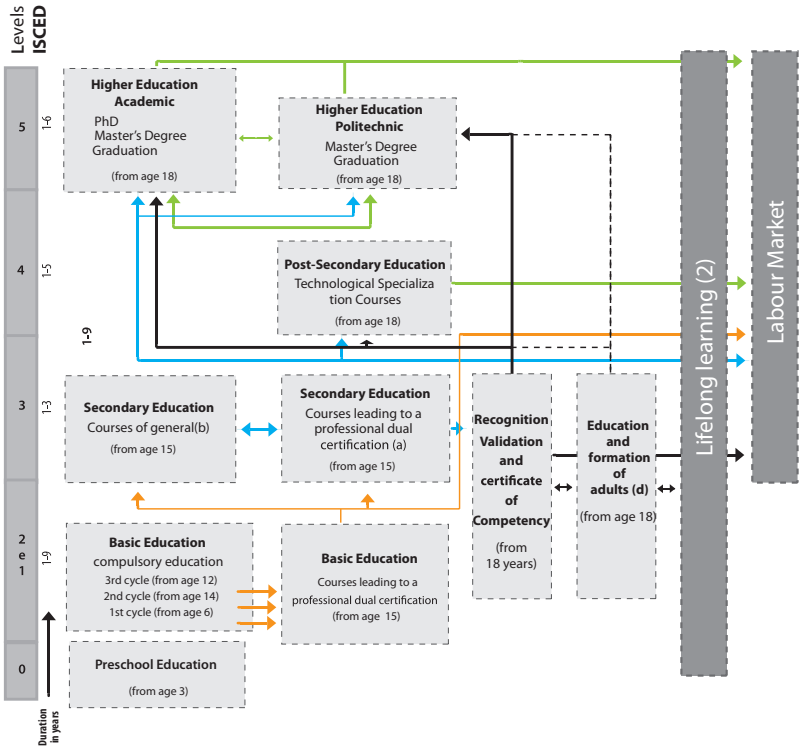
an increasing trend in the number of students. These courses had the duration of three years and the trainees were paid for their work in the company, although not being part of it staff. As we can see, this in-house training, factory, workshop, usually in the workplace is advocated by many authors as essential and an integral part of vocational courses (Guggenheim, 1999, Freudenberg et al, 2010). After this resurgence in the 80th vocational courses, which fill the gap somehow left with the disappearance of industrial and commercial schools, in the early 90's, a stop growth of such courses was followed.

In 1999, the CET (SCHE) in Portugal appeared under a specific legislation, although they emerged in 1993, "Even though CETs are not the fruit of specific legislation, the first indications of the emergence of CETs in Portugal date from 1993, when they were an additional form of vocational training schools which could offer "(Costa et al., 2009, p.155).

Its appearance is the result of a need to give an internal response, due to the lack of certain regional and local profiles of intermediate workers, required by employers and also in line with what was happening in Europe to follow up the training obtained in the secondary education including level III courses. These courses in the education system in force in Portugal are framed, as can be seen in Scheme 1, between secondary schools and higher education. Vocational schools, training centers and other institutions may offer CET but they need to have a protocol with a higher education institution.

Vocational education in Forcet

The Technological Specialization Courses, showed in Picture 1, are available for individuals over eighteen years old who have completed the twelfth year or hold a Level III course. However, those who do not comply with this condition can also apply to attend one of these courses, if they prove they hold a degree or diploma of higher education. Individuals over 23 years old may also apply to these courses. In this case they will need a positive opinion from a jury who analyzed their professional and academic path and verified if they have the conditions to complete successfully the CET concerned. The candidates who do not have the twelfth year and those only holding part of the subjects will have to pass a list of subjects that correspond to the training given in the twelfth year that they are missing. The number of subjects to attend varies from trainee to trainee, since the case that they will have to attend all these subjects if they were not approved in any of the twelfth year, or just in one, if it lacks just that. This training in administration and formal terms allows the trainees when they finish the CET to apply to higher education, throughout a special contest. The higher education institutions may also credit the obtained training in the CET. All these procedures are regulated by specific legislation and as it can be seen to get a CET



Scheme 1. System of education and training in Portugal. Source: (Ferreira, 2007, p. 20)

diploma in the Portuguese education system allows the trainee to enter into the job market or join the higher education or even both.

The Forcet is the organic unity of the IPL, which aims "... streamline the creation of post-secondary education within the IPL, as well as implement and coordinate all post-secondary training involving the Schools of the IPL and other entities with which partnerships have been established to that end "(IPL, 2011). According to the data provided by the Forcet, the IPL has approved the operation of thirty-one different courses spread on various areas of training.

As we can see by consulting the official website of the Directorate General of Higher Education (DGES, 2011) these courses are in accordance with the structure of the current four-level courses in Portugal and comprises three areas of training: general, technical and in work context. The first aims to teach students the scientific knowledge of the specific technologies that underlie the training area. In the technological component it is intended that trainees can acquire knowledge to solve practical activities related to areas of technological nature. With the on-the-job training it is

intended that the trainee is capable of performing activities involving the techniques and technology that are used in production processes of goods or services. Training in the workplace has lenght depending on the course usually between 420 and 525 hours, approximately 3 months. The importance of this component is also expressed by having a separate regulation. Under this regulation this training is conducted under the supervision of an officer appointed for this purpose by the company or institution. A supervisor appointed by Forcet must accompany the student during this training. This supervisor must visit the company or institution in which the training is occurring preferably three times during the stage. In a recent study, held in the first months of 2011, with 322 companies that received the trainees during the year 2010, it was found that 80%, consider the role of supervisor as positive, but some suggest that the number of visits should increase (Santos, 2011). All trainees of these courses have to go through this training. Exceptions are only for those who demonstrate professional experience, at least for 18 months in the area of your course. The rest of them may choose a company they know and in which they want to develop this training and practice, establishing then a protocol aimed at the effectiveness of the stage. For those who do not have any reference, the Forcet has a list of companies for each course with a signed protocol.

In the last edition, the Forcet established protocols with 322 companies willing to accept trainees (Santos, 2011). This Table illustrates the relationship with the work world and Forcet effort in the integration of their trainees. It would be interesting to know in the future, the level of employability of these companies which received trainees and which had established an employment contract with the trainees from the CET.

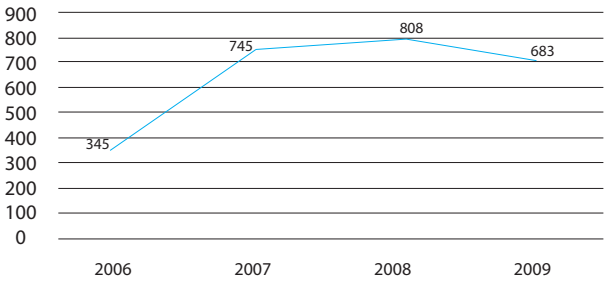


Table 1. Number of Forcet graduates over the years. Source: (data provided by Forcet)

On the other hand, according to data provided by the Forcet, if we remove from the total number of trainees those who were exempted from the training in the workplace, because they had been practicing for more than eighteen months in a company or institution in the area of their courses, we will get an average of around just over a student for internship.

Vocational training schools in the region of Styria - Austria

In Austria, after completing nine years of compulsory schooling, young people can join the vocational education without any prerequisite. They adhere to this system based on learning while working, on average, about 40% of students hold a professional qualification. The operation and funding conditions of the schools have slight differences from region to region, since the costs are supported largely by the heads of provinces and municipalities. In these costs are included the maintenance of the school, with its buildings, payment of the school doctor, trainers and staff charges as well.

The schools we visited belong to the education system, and are divided into two local learning parts: the school and company. Within this dual system it is included the trainee displacement to the school during eight to twelve weeks, depending on the professional area, ranging between two and four years. There is another mode in which the trainee is in the company all the week and moves to school one day a week.

During the visit to the schools we found that the trainees themselves, their parents, companies and public entities are all in tune and recognize this type of education as a benefit. This organization works for many years and is now fully tested and streamlined, so that young people adhere to it very consciously as we could realize when talking to them.

Before attending these schools those trainees have to be working in a company, it means that it is not at the end of the course that will be inserted in the context of learning at work, but they start with this integration and are admitted at the school after that part. Hence, even during this school part, they are earning a salary, the same as if they were at work. Within this operation logic, the number of hours per day, round the nine hours, the same as the trainee would have to work if in the company. Even in this period at school the student continues to receive his salary. This wage is uniform and set top. The salary is the same for everyone and is increasing every year according to the approved table. This does not prevent companies in particular to pay more to their trainees if they wish. The intention is that no trainee receives less than the stipulated amount.

Training in schools varies between eight and nine weeks a year for three years and it is a boarding system, since schools have dormitories for the purpose. In the schools they receive general and specific training, essentially practical, simulating

situations that may appear on professional performance. This training is given by trainers. The school facilities allow simulating companies' situations. In the illustrated case in picture one, in Bad Radkersburg, trainees can train the situations that may occur in a supermarket. In another school, picture two, students can take classes in their own environment workshop. Concerning equipment, they are the most modern equipment so they can practice, as in the case of Arnfels, including the latest cars models. In the school of Eibiswald they have all the equipment so they can practice real life situations such as the programming of traffic lights as you can see picture three. The classrooms range from the conventional ones, those which have computers placed in the usual way and others with more innovative provisions as we can see in the case of Gleinstätten, picture four. In this school trainees have a space that is a real pastry and another where they are in a clothing store. They have the opportunity to follow in different spaces the various stages of production. In the case of clothing store, from its conception to production and sales. In the course dedicated to pastries there is a kitchen with all equipment for the industrial production of cakes and bread, until its sale in the bakery.

The monitoring in the workplace is performed by an employee whose skills have to be recognized by business and industry associations. It was explained to us that in the event of a trainee working in a small shop with two employees, one of them has to be recognized by the corresponding association in order to accompany the student.

Usually, in the companies, these trainees go through several sections and perform various tasks in order to stay with an overview of the entire company. Austrians employers are fond of these students and usually at the end of the course, set an employment relationship to continue. As we saw in the companies we visited and from the conversations we had with workers from this system, they move up into the corporate boards, reaching responsibility positions.

The difference between these trainees and other workers is that the latter play only a specific task for which they were hired and know little of the organizational structure of the company, while these trainees stay with a global perception of the functioning itself.

Conclusion

The above two reported systems aimed at training and qualification of young people and their integration in the labor market. In both systems is recognized the importance of training in the work, in order to improve the inclusion of trainees in the labor market. Also in both systems the students have equipment in schools where they can practice the acquired knowledge. It is important to highlight the concern of Styria schools in simulating the environment in which those trainees will enter as the case of shops, supermarkets and bakeries. In this environment, they may respond to all tasks that they have to perform, including serving customers.

However, there are some differences in the mode of operation. Training in the workplace, in the case of Forcet occurs at the end of training, it is the last step. In the schools we visited in Austria trainees coming from companies, to participate in this type of training must find a company first. And since we focused on companies, in the Forcet system any company can be insert into this project while in the school we visited it is required at least an employee who is recognized by the associations they belong to, to follow up the students. Despite the efforts of services in the Forcet to establish protocols with many entities, it seems that this requirement makes the difference since it is a quality factor.

Finally, in what concerns employability, Forcet will face in the near future data to support this factor. As already mentioned, there is a great concern to provide trainees training in the workplace, but it is unknown whether this corresponds to a later setting of the students to the receiving company. In the Austrian system companies bet on these trainees as future workers and they are preferred by the quality they reveal. This makes a tested Austrian system and recognized by all stakeholders as a positive structure. In the case of the Forcet, it lacks the development studies to support the same recognition.

Bibliography

Becker, G. S. (1975). Human Capital: A Theoretical and Empirical Analysis, With Special Reference to Education. Chicago, IL: University of Chicago Press.

Costa, N. M. V. N., Simões, A. R., Pereira, G. A., Pombo, L. (2009). Technological specialisation courses in Portugal: description and suggested improvements. European journal of vocational training, n46, p151-173.

DGES, (2011). Direcção Geral do Ensino Superior, Cursos de Especialização Tecnológica: Nova Oferta Formativa Profissionalizante. Disponível em http://www.dges.mctes.pt/DGES/pt/Instituicoes/CET/OqueE. Ultimo acesso em 3 Maio 2011.

Ferreira, M. C. A. F. (2007). O Sistema de Educação e Formação Profissional em Portugal Descrição sumária. Cedefop Panorama series; 142 Luxemburgo: Serviço das Publicações Oficiais das Comunidades Europeias.

Freudenberg, B., Brimble, M., Cameron, C. (2010). Where There Is a WIL There Is a Way. Higher Education Research and Development, v29 n5 p575-588.

Guggenheim, E. F. (1999). Learning: where, when and how? Comunicação apresentada na conferência Agora VII: Working Time, Training Time (Thessaloniki, Greece, October 7-8, pag. 19-23. CEDEFOP Panomara Series. Documento disponibilizado pelos Serviços ERIC ED 478874.

Hoeckel, K. (2010). Learning for Jobs. OECD Reviews of Vocational Education and Training – Austria. OECD. Disponível em http://www.oecd.org/dataoecd/29/33/45407970.pdf. Ultimo acesso em 10 Maio 2011.

IPL (2011). Instituto Politécnico de Leiria, Apresentação do For.cet. Disponível em http://www.ipleiria.pt/portal/ipleiria?p_id=24125. Ultimo acesso em 3 Maio 2011.

Luyckx, K., De Witte, H., Goossens, L. (2011). Perceived Instability in Emerging Adulthood: The Protective Role of Identity Capital. Journal of Applied Developmental Psychology, v32 n3 p137-145 May-Jun 2011

Pereira, G.; Costa, N.; Duarte, M. O. (2006). Jovens e adultos no ensino profissional pós-secundário – inclusão ou exclusão? In: Actas do Encontro Nacional de Didáctica e Práticas de Ensino, Brasil: Universidade Federal de Pernambuco.

Santos, D. (2011). Avaliação global da formação em contexto de trabalho. 2009. Documento produzido pelo Forcet. Instituto Politécnico de Leiria.

Mota, A. et al, (1985). Vocational Training in Portugal. European Cantre for the Development of Vocational Training, Berlin (west Germany). (Documento disponibilizado pelos Serviços ERIC ED 316695.

Repper-Braun, E. (2010). Structures of Education and Training Systems in Europe – Austria. Austrian EURYDICE information unit. Edition 2008/2010. Disponivel em http://eacea.ec.europa.eu/education/eurydice/documents/eurybase/structures/041_AT_EN.pdf. Ultimo acesso em 11 Maio 2011.

Kuczera, M. (2010). Learning for Jobs OECD Reviews of Vocational Education and Training CZECH REPUBLIC. OECD. Disponível em http://www.nuov.cz/uploads/ostatni_soubory/Learning_for_Jobs_OECD_report_on_the_CR_final.pdf. Ultimo acesso em 10 Maio 2011.

Rodrigues, L. (2009). Impressões de Áustria: uma experiência etnográfica com alunos do ensino vocacional. Fórum Mundial de Educação Profissional e Tecnológica, Educação, Desenvolvimento e Inclusão. Centro de Convenções Ulysses Guimarães, 23-27 Novembro. Brasilia.

Vivas, A. (2009). Training and Labour Market Integration of Education Science Graduates. European Journal of Vocational Training, v47 n2 p77-102.

CET IN INSTITUTO POLITÉCNICO DE SANTARÉM

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Abstract:

The current paper shows the evolution of Technological Specialization Courses in Santarém's Polytechnic Institute. Various aspects concerning the trainees/students are covered. Various profiles, such as geographical origin of the trainees, previous academic certificates, academic success in the courses, and professional track of those that have completed the courses. As to the those who have finished the courses, we present data concerning professional outcomes, entrance and continuation of studies in Santarém's polytechnic Institute and academic success in the next academic level (6, licenciatura). The information was gathered from the direction IPS.FORM, directions of schools, course coordinators and academic services of schools.

Keywords
Technological Specialization Courses; Polytechnic Institute of Santarém; CET; DET; level 5.

Introduction

Technological Specialization Courses or Cursos de Especialização Tecnológica (CET) are post secondary, non higher education degrees which confer a level 5 professional qualification, in a 1 to 8 scale, and are regulated by Decreto-Lei n.º 88/2006, 23rd May [3]. O Instituto Politécnico de Santarém (IPSantarém), Polytechnic Institute of Santarém, has had CET's functioning since the 2007/2008 academic year. Eleven CET's are registered (Table 1), nine in Escola Superior Agrária de Santarém (ESAS), agricultural school, of which one is to be cancelled, and two in e dois na Escola Superior de Gestão e Tecnologia de Santarém (ESGTS), school of management and technology.

Of these eleven only four are running in ESAS and two in ESGTS, totalling 82 trainees in ESAS (completing their training in July 2011) and 37 in ESGTS (which will soon finish their training). One of the courses in ESAS (Segurança e Higiene Alimentar/ Food safety and hygiene) is on its fourth year.

A course on WEB Applications Programming (60 ECTS), promoted by Escola Superior de Educação de Santarém (ESES), school of education, is in the process of being created, authorized and registered. This school predictably will present two new courses. Escola Superior Saúde de Santarém (ESSS) has three courses which are about to be registered (Home Support, Geriatric Support and Health and Support in Sports)

Escola de Desporto de Rio Maior (EDRM), in partnership with a school of training has the intention of registering a course on Swimming Pool Maintenance.

Course code	Denomination	ECTS	Duration	CNAEF training area	Legislation	Description	Date
				Code	Technical area		
7132	Segurança e Higiene Alimentar/food safety and hygiene	60	2 Semestres	541	Indústrias Alimentares	Despacho n.º 10861/2008	14-04-2008
7133	Sistemas de Informação Geográfica/ Computerized geographical systems	60	2 Semestres	581	Arquitectura e Urbanismo	Despacho n.º 10862/2008	14-04-2008
7160	Cadastro e Avaliação de Propriedades/Property evaluation	60	2 Semestres	581	Arquitectura e Urbanismo	Despacho n.º 10860/2008	14-04-2008
7202	Tecnologias de Produção Integrada em Hortícolas/Integrated production Technologies in horticulture	60	2 Semestres	621	Produção Agrícola e Animal	Despacho n.º 10868/2008	14-04-2008
7102	Instalação e Manutenção de Redes e Sistemas Informáticos/ Installation and maintenance of computerized networks and systems	67	3 Semestres	481	Ciências Informáticas	Despacho n.º 21361/2008	14-08-2008
7101	Desenvolvimento de Produtos Multimédia/ Development of multimédia products	76	n.d.	481	Ciências Informáticas	Despacho n.º 1117/2009	13-01-2009
7185	Cuidados Veterinários/ Veterinary care	60	2 Semestres	640	Ciências Veterinárias	Despacho n.º 16335/2009	16-07-2009
7214	Viticultura e Enologia/Viticulture and winemaking	60	2 Semestres	621	Produção Agrícola e Animal	Despacho n.º 1769/2010	26-01-2010
7245	Olivicultura e Tecnologia do Azeite/ Olive tree and olive oil production	60	2 Semestres	621	Produção Agrícola e Animal	Despacho n.º 1767/2010	26-01-2010
7248	Maneio e Utilização do Cavalo/Horse management and utilization	60	2 Semestres	621	Produção Agrícola e Animal	Despacho n.º 12656/2010	05-08-2010
7199	Mecanização e Tecnologia Agrária/Agraian mechanization and technology	60	2 Semestres	621	Produção Agrícola e Animal	Despacho n.º 2157/2011	28-01-2011

Table 1. CET's registered by IPSantarém

Profile of candidates to CET's

In the analysis of the profiles of the cnadidates we have used data on the courses we have functioning for alonger period of time in ESAS, because there is more data to analyse. As for the geographical origin of the candidates, in Figure 1 we can check on the distribution by district of origin in each academic year. We can see that candidates predominantly come from the district of Santarém, then Lisbon and Leiria. Foreign candidates, which are sons or relatives of immigrants, live in the district of Santarém. There is also a reduced number of candidates from Azores and Madeira. It can be seen that our courses are seeked by candidates from different national regions, especially from the South, such as Portalegre, Setúbal, Beja, Évora and Faro.

The distribution of the candidates' academic degrees is shown in Figure 2.

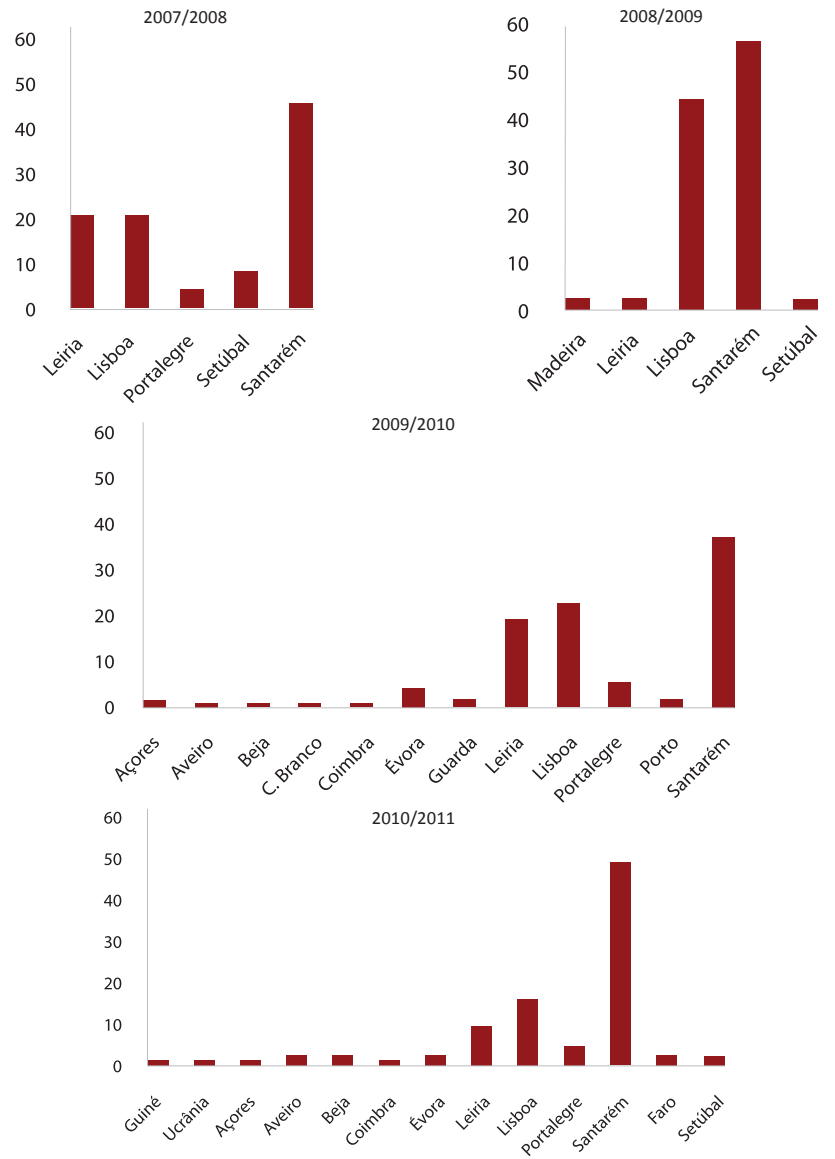

Figura 1. Geographical origin of candidates to CET's in IPSantarém

From its analysis we can conclude that they predominantly have a previous level 3 course (nível 3), followed by those with, completed or incomplete, track of twelve years of study (12º ano). From this we understand that CET's are more appealing to candidates which come from previous level professional courses. However, even though sporadically, there are also candidates with a university degree looking for professional training which they did not get from their previous degree.

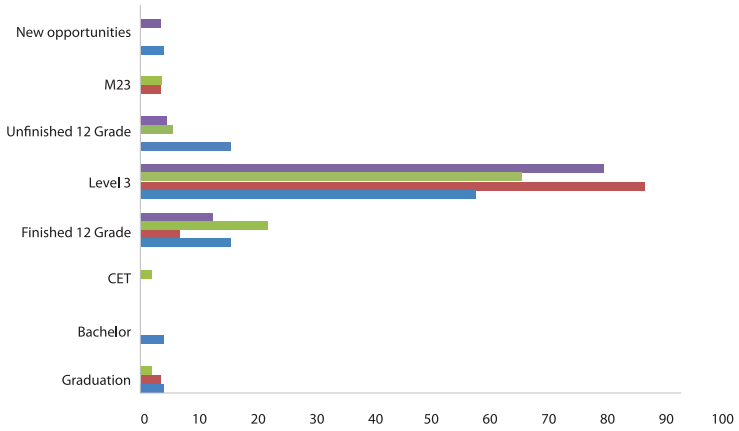

Figure 2. Academic degrees of candidates to CET's in the 2007/2008 - 2010/2011 interval

In the distribution of gender in trainees of CET's, in Table 2 it can be concluded that that there is not a tendency; with some years prevailing male trainees and others females, with an alternation in gender.

CET	2010/2011		2009/2010		2008/2009		2007/2008	
	M	F	M	F	M	F	M	F
Food Safety, Hygiene and Veterinary Care	4	20	9	11	7	13	16	8
	9	11	10	7	8	12		
Management and use of the Horse	4	12	11	7				
Integrated Production Technologies in Horticulture	0	0	16	6				
Viticulture and Enology	14	5						

Table 2. Distribution of gender in CET's trainees

In Table 3 we can envisage the evolution of the number of candidates, which has grown anually, their placement in courses and those which have successfully completed the courses. Over seventy percent of them have succeeded in finishing the course.

Academic Year	N. of candidates	Accepted	Completion
2007/2008	30	25	24
2008/2009	69	56	40
2009/2010	117	90	77
2010/2011	158	103	-

Table 3. Candidates, candidacies accepted and completion of courses in ESAS

Professional track after obtaining the degree [Diploma de Especialização Percurso Profissional (DET)]

Anyone holding a certificate of a CET may apply to enter the next academic level (Licenciatura) in a course which is related to CET and allows the continuation of studies. These candidates will have some curricular units of previous courses credited on the next course, which is dependent upon the affinity between the previous course with the one that follows. In Table 4, the evolution of candidates applying for Licenciatura holding a CET certificate from ESAS or outside ESAS. An increase can be noticed and there is a predominance of candidates with a DET that want to carry on with their studies in the same school they obtained their certificate.

Academic year	DET from ESAS	DET outside ESAS	Total
2008/2009	15	12	27
2009/2010	26	16	42
2010/2011	59	29	88

Table 4. Candidates, with a DET, applying to a Licenciatura (next level) in ESAS

From the analysis of Table 5 we can track the behaviour of CET Segurança e Higiene Alimentar (Food Safety and Hygiene) DET certificate holders from ESAS.

In 2007/2008 of the 24 that finished the CET 62,5 % entered ESAS, in 2008/2009 70 % in 20 and in 2008/2010 90 % of 20 finishing the course. The number of elements on a job has lowered and it can also be concluded that those working are doing that in the main professional area of the CET.

Academic year	Approved	In job	Went into ESAS
2007/2008	24	9	15
2008/2009	20	6	14
2009/2010	20	2	18

Table 5. Number of candidates completing (Approved) CET Segurança e Higiene Alimentar (SHS) (ESAS) (Food Safety and Hygiene) and their situation after the course

In Table 6 we analyse which courses in the next level (6) (Licenciatura) were chosen by candidates holding a CET SHA certificate.

Academic year	Candidates with CET SHA	Candidates in Engenharia Alimentar
2008/2009	15	5
2009/2010	14	11
2010/2011	18	16

Table 6. Number of candidates having completed CET SHA and followed into Engenharia alimentar (Food engineering) in the next academic level

In the first edition of the course 33 % chose Engenharia Alimentar (Food engineering), in the second 78,5 %, and in the third 89 %. We thereby conclude that there has been option based on the affinity between courses and the articulation between curricular contents of both courses. CET candidates show a growing, very targeted choice of the training areas.

In the attempt to evaluate the academic success of the trainees as students in the next academic level and analyzing the number of curricular units they leave behind each academic year, we have found that in the 2007/2008 and 2008/2009 editions they left behind a higher number of curricular units (4) and in the last edition (2009/2010) that, on average, corresponded to 3 units. Even though there is not enough data to evaluate this, we consider it fundamental to accompany the track these students, recognizing and characterizing academic failure, identifying and implementing corrective measures, in order to increase success rate [6]. Also, even though these data refer only to the CET SHA, the tendency for DET holders to go into an ESAS course related to the CET happens in all CET's in ESAS, as we show in the Table 7. This further reinforces the tendency for choice to be based on the affinity between courses in both academic levels.

CET	Nr. candidates with CET	Nr. entering Graduation (level 6)	Graduation
Integrated Production Technologies in Horticulture	22	17	Agronomy Engineering
Veterinary Care (2 editions)	37	19	Animal Production Engineering
Management and use of the Horse	18	13	Animal Production Engineering

Table 7. Number of candidates that have completed CET's at ESAS and have gone into the next level (6) courses (Licenciatura)

Financing of CET's

On what concerns financing of CET's, Decreto-lei n.º 88/2006, which regulates these courses, according to artigo (article) 47:

1- CET's are considered in the functioning budget attributed to teaching and training activities, referred in artigo 4º of Lei n.º 37/2003, 22nd August, which was altered by Lei n.º 49/2005, 30th August.

2- Financing is also considered in the formula in artigo 4º of Lei n.º 37/2003, 22nd August, being calculated based on the number of trainees, and, with the necessary adaption to level and nature of the courses, through the application of criteria, standard values and performance indicators that are there foreseen.

3- Public financing will be attributed if there is a minimum of 15 trainees.

Public financing before, a new mode of financing contrato de confiança (contract of confidence) [1], was made by amounts defined by the respective minister. In the current year financing was to be attributed according to contract of confidence, by an increase in the budget that would then be transferred to the institutions. That has not happened. IPSantarém does not know how CET's that have to be financed will actually be financed, because the only source of revenue, fees (Table 7), only covers, in the brightest scenery, with a third of the expenses – if it is assumed trainers are exclusively paid on an hourly basis of payment.

Academic year	Fees (€)
2007/2008	500
2008/2009	500
2009/2010	528
2010/2011	557

Table 8. Fees paid for a CET in IPSantarém

Conclusion

Since these courses being courses recently introduced are another working instrument that was put at the institutions of higher education's consideration, recommended because of their professional nature, especially for polytechnics. They have the objective of qualifying youngters and adults, including requalification. These courses have had behind them a policy that orients them integrate level 5 technicians in the job market, with a particular focus on regional economies, allowing also that they may enter university, crediting the skills that were acquired in CET's [3]. As we have previously seen the increase in candidates' interest for these courses as led to an increase in students in IPSantarém, as happens in similar institutions. This increase is partly due to a better marketing, which relies on a better awareness of students of the existence of CET's. Former trainees have been the best marketing tool. Besides this, some of courses in the next level have need students coming from CET's, which enter through a special candidacy system. In some courses, if students were to come only from other sources, there would not be a minimum of 20 students in the Licenciatura level (6) in the common regime, a condition necessary for them to be financed by public financing.

On the other hand, Development Programmes (Planos de Desenvolvimento) which polytechnics were asked to come up with [6], and established in contrato de confiança, signed in January 2010, by Government and Public Higher Education Institution, generally, reinforced the priorities the contract, namely the qualification of workers and the Portuguese population by generalization of CET's. We therefore consider that if financial constrains are solved these courses give answer to important needs in regional development, not only in lifelong learning activities for local populations, but also, due to their heavy professionalizing nature and by the chance they give young people to continue of studying, not leave an academic track sooner, and thereby reinforcing the social dimension of higher eduction [2] through better skills, contributing to employability, social inclusion and personal fulfillment.

Bibliography

Anuário Financeiro das Instituições Públicas de Ensino Superior Politécnico 2008
Conselho Coordenador dos Institutos Superiores Politécnicos.

Conclusões do Conselho de 11 de Maio de 2010 sobre a dimensão social da educação e da formação. Jornal Oficial da União Europeia C 135 de 26.5.2010

Cursos de Especialização Tecnológica: Evolução 2006-2009 - DGES Fevereiro 2010.

Cursos de Especialização Tecnológica no Ensino Superior Inscritos [2004-05 a 2008-09] | Diplomados [2005-06 a 2007-08] - Gabinete de Planeamento, Estratégia, Avaliação e Relações Internacionais Ministério da Ciência, Tecnologia e Ensino Superior / Direcção de Serviços de Informação Estatística em Ensino Superior – 2010

Documentos internos do Instituto Politécnico de Santarém.

Programas de Desenvolvimento das instituições de ensino superior politécnico - Conselho Coordenador dos Institutos Superiores Politécnicos - Setembro 2010

EDUCATION AND TRAINING_ET

Helena Veludo

Palavras chave
Education and Training, Subject, Demand, Mobility, Accreditation

Notes for a Future

The European Union through the Lisbon Strategy suggests as its main objective becoming the most dynamic and the most competitive economy of the world. The knowledge will be the basis of this economy.

Education and training, the most important foundation of the "citizen ability development throughout his life"[1] and its territories, should claim an articulation role between the different knowledge stages, from the basic ones, until higher education, with a focus on the subject.

This transversal character, both in national and European space (Copenhagen Process 2002[2] and Lisbon Strategy 2010"[3] is asserted by the fact that it is actually taking place and by the massive response to the multiple education and training courses.

Competitiveness, social cohesion and the creation of jobs are essential vectors that state the need of a continuous training.

This training should be able to follow the dynamics of what is actually happening focusing on the subject, and on the demand.

It should give priority to the needs of the individual and of the community in an articulated way, being essential the creation of relationships with the regional level. However, to education and training the different territorial scales, from the transnational to the national, regional and local are equally important.

In general, education and training can leverage an individual's qualification process and, in particular, the regional and local territories, interacting and cooperating with the industry and trade in order to complement their technical staff, in the intermediate staff level[4].

Education and training, settled in a tripartite model – training schools, community and social partners – should instigate the participation and the creation of partnerships, in order to guarantee its quality.

[1] http://ec.europa.eu./dgs/education_culture/consult/index.euhtml
[2] Copenhagen Process, November 2002 – strengthened the European cooperation in what concerns education and training
[3] Lisbon Strategy _ " Education and Training 2010" – ET. Three strategic objectives, quality increase and the effectiveness of the educational and training systems in the European community, ease of access and opening to the exterior world of all educational and training systems.

Three important issues in the education and training statement: contents, mobility and accreditation

Contents

Education and training develop according to 3 components: general and scientific, technological and within the realm of work.

Articulating basic and higher education, and providing a constant qualification of the citizen, general education weaknesses should be taken into account in order to answer the labour market requests which has a more dynamic character.

Education and training should consider new trends as well as the needs and promote it in a more encompassing, national, regional and local, as well as transnational levels.

It should assume its intermediate character, its importance to the business activities, in particular at the regional and local level, and also to any individual an education that will give him/her a better ability to participate as a citizen.

The knowledge society compels to know, to learn how to learn and to learn how to do.

It is very important to promote education and training of citizens, since this can lead to a more active and qualified action from all. This training should allow all citizens to master the actions that will allow a culture of doing.

Two key questions are assumed here: that only with participation of all we all will be better and that knowledge is essential to doing.

Some successful experiences of revitalization of territorial areas, of their economic areas and business, proved to be essential so that education and training take their role in answering issues of demand and need.

In 1971 Jamie Lerner[5], Curitiba's city mayor, once one of the poorest prefectures of Brazil, defined a strategy of recovery and revitalization of the territory, which in 2008 received UNESCO's alphabetization award.

This strategy considered the great value of training in a knowledge society. Following this, the first Environment University was founded, encouraging a week's attendance to all the students of every school, as well as of teachers in order to teach them the importance of their actions, and simultaneously, to teach how to read and write people aged 45 to 80.

Confirming the knowledge as an important pillar to the development of citizen's abilities, this example reveals the need to reformulate the contents, based on the demand and on the needs of the territory in which it is based.

In 1980's, in Marinha Grande - Portugal, a particularly dynamic business city knew how to adapt itself to the new realities, when the glass industry showed some fragilities, therefore presenting another industry – the plastic moulds industry. Local education and training schools developed training over the last two decades, considering the business dynamic and its demand[6].

Education and training should encourage interactions and move the intervenients both national as regional and local levels between European Union member states, in order to reinforce the visibility and the mutual complicity.

Education and training contents involve an analysis and a precocious identification of the needs in terms of expertise and programming offers.

Emerging issues such as sustainability, renewable energies, new technologies, design, cultural and natural patrimony recovery and rehabilitation, are issues that need urgent education and training, because they are new and must be urgently worked in real life.

Mobility

To Education and Training mobility will also be essential since, through the sharing of experience, it opens opportunities to a more complementary and enlarged apprenticeship.

Mobility, being a complicity process through participation, can reinforce the European cooperation, one of the most important vectors proposed by Lisbon Strategy[3].

This transnational training also reveals some weaknesses in identifying and validating the results from the apprenticeships made abroad, but it is already served by the European Credit System for Education and Training - ECVET[7].

The reinforcement of the European cooperation on education and training acknowledges the possibility of experience exchange and the assertion of the sense of belonging to the territory where one acts and participates.

This mobility should be extended to all Education and Training teachers and students, and should increasingly be more an answer to programmes which individual dynamics generate in collective dynamics.

Accreditation

Education and training, proposed by Lisbon Strategy, rest on 3 essential issues: quality and efficacy increase, ease of access and the opening to the outside world of education and training systems in European Union, assuming an articulation role between basic and higher education and focused on the individual, consider proximity and demand

[4] The Common European Framework for Quality Insurance for ET aims to improve its national actions of quality management in this domain, through the introduction of a set of common criteria and indicators.

[5] Jaime Lerner, born December, 17th 1937 in Curitiba, a Brazilian politician, arquitect and urbanist. He was Curitiba's prefect for 3 times and Paraná's governor for 2 times. His strategy for Curitiba, based on 3 important vectors – environment, patrimony and recovery - immediately considered the importance of training in a knowledge society. 15 years after the implementation, he won the UNESCO award for development.

[6] CENFIM (Centro de Formação Profissional da Indústria Metalúrgica) and EPAMG (Escola Profissional e Artística da Marinha Grande)

[7] ECVET- European Credit System for Education and Training – accumulation, capitalization and transfer system of units, created for education and training in Europe

as definers of its contents. This proximity to regional and local scales considers its belonging to a larger territorial scale – the European Community, mobility being the essential vector for the affirmation of the reinforcement of the cooperation between member states.

Today, training is revealed in credits, being its content able to be the result of an individual choice, which is built on a collective system.

The student can build his/her knowledge in several sources, being imperative that he should be aware of the apprenticeship progresses (implicit and informal ones).

Education and training, wanting to be increasingly focused on the subject, immediately admits its necessary adaptiveness to search and capable to print out a higher dynamic to apprenticeship.

Accreditation and apprenticeship validation should be the reflection of that search and revealer of that individual process.

Thereby, it is important to clarify education and training qualifications, on the level of their technical and legal framework, as well as their precedences within the Common European Framework of Quality Assurance, so that based on the subject, it is an effective reflection of demand, that is to say, the world of life.

TECHNOLOGICAL SPECIALIZATION COURSE IN BUILDING AND PUBLIC WORKS: STUDENT DESCRIPTION

João Santos . Miguel Baio

Abstract

This article presents a description of students on the Technological Specialization Course in Building and Public Works offered by the Higher School of Technology of Barreiro of the Polytechnic Institute of Setúbal, Portugal. The course corresponds to a total of 2000 hours of training to level 5, according to the National Qualifications Framework, and was registered on 28 February 2007. It has attracted students who show great diversity in terms of their basic training and professional experience, and other factors of interest, such as social and geographical differences, at the time of entry and exit. The registration data of graduates are used to analyse the career of technical experts in building and public works to ascertain to what extent the Diploma of Technological Specialization (DET) contributed to the improvement of their social and professional status.

Keywords
Buildings, public works, technical expert, professional experience, ECTS.

Introduction

The Higher School of Technology in Barreiro (ESTBarreiro / IPS) was founded on 14 July 1999 by Decree-Law no. 264/99, which integrated a group of five schools that constitute the Polytechnic Institute of Setúbal, Portugal. It teaches courses covering engineering and technology. The ESTBarreiro / IPS, dedicated to responding to market needs, has been a pioneer and driving force for training in emerging areas. Examples of this are training in conservation and rehabilitation of buildings and building management to graduate level. The publication of law 88/2006, which introduced the CET in higher education, soon showed these courses' importance and their role in filling the gap between post-secondary and higher education, and their potential to attract new audiences with the maturity and experience that could, together with new pedagogical challenges, enrich the academic and scientific community. Besides these courses in buildings and public works, in 2011 the institution developed a course in laboratory techniques. This paper, however, will focus only on the buildings and public works course.

Technological Specialization Course in Building and Public Works

The Technological Specialization Course in Building and Public Works, in operation since the academic year 2007/08, seeks to produce technical specialists whose job profile requires considerable autonomy and the ability to integrate with a team, contributing to best practices and quality of construction.

Skills and career opportunities

The Technological Specialization Diploma in Building and Public Works, provides students with technical skills, and teaches them how to assess costs, and deal with budgeting and price revisions. Work on building projects as part of their training and within the limits imposed by law; participate in managing work; contribute to the promotion of quality, safety, hygiene and health in the achievement of construction projects and civil engineering; help implement significant improvements in the competency of the labour-intensive techniques employed in the sector, particularly in small and medium-sized enterprises; use materials and building processes rationally and in a context of increased productivity and sustainable development, contributing to the implementation of processes to adapt to technological changes; programme and execute works; collaborate in the organization and implementation of plans for safety, hygiene and health in construction.

Career opportunities, despite the major changes that the industry has suffered owing to the financial crisis, include budgeting works, preparation and planning of works, building inspection, assistance with construction and management of construction projects.

Syllabus

The curriculum consists of training components: general and scientific, technological and work context. The syllabus is provided by the Sections of Building and Environment, Structures and Geotechnics and Mathematics and Management, with contributions from the scientific areas of Building and Rehabilitation, Mechanics, Structures and Geotechnics and Economics and Management .

The distribution of units per semester is shown in Table 1. The two semesters correspond to 28 ECTS, of which training in the workplace represents 24 ECTS:

1st year , 1st Semester	2nd year, 2nd Semester	2nd year, 2nd Semester
Physics for buildings	Communication, organizational behaviour, and entrepreneurship	Work placement
Geothenics	Structures of buildings and works of art	
Building materials	Planning and entrepreneurship II: management	
Planning and entrepreneurship I: management	Building processes	
Building project	Safety and health in buildings	
	Society, economics and law	

Table 1. Syllabus

Student Demographics

Students who attend this specific course generally constitute a group with professional experience in building or related areas. Some younger ones enrol, however, because they think it is a way to continue in education, get a better job or pursue a degree in civil engineering or construction management.

Most students come from the district of Setúbal, but the Lisbon region contributes a significant number of students, which might indicate a shortage of training on the north bank of the Tagus river.

Biographical data - age, gender and origin

As is typical in building area, we can see in Figure 1 and Table 2 that there is a predominance of male students, although there has been a slight increase in females in the last few years.

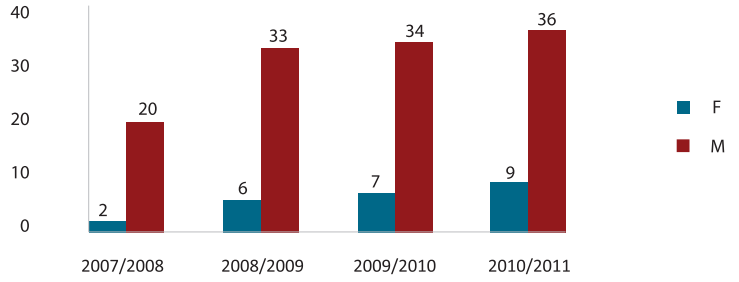

Fig. 1. Student characterization – by gender

	F	M	Total
2007/2008	9%	91%	22
2008/2009	15%	85%	39
2009/2010	17%	83%	41
2010/2011	20%	80%	45
Total	24	123	147

Tabela 2. Student characterization - by gender

As shown in Figure 1, the 40.5 years average age recorded in the first course decreases in the sequent courses. One can consider this, in a free interpretation due to the indication, among others, that there would be a group of individuals from the region, mostly technical or construction agents knowledgeable about the introduction of the CET, waiting to the start of this course taught by this school

The majority of the incoming students come from Setúbal but Lisbon as well contributed reasonably across the years (Table 3).

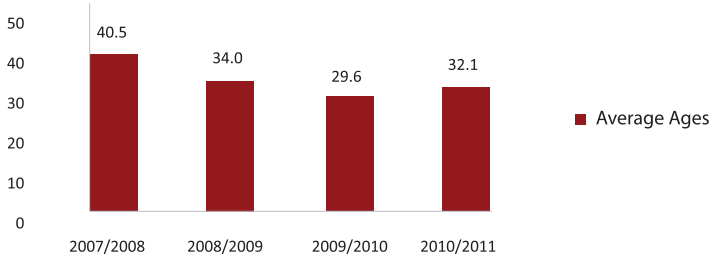

Fig. 2. Student characterization – variation in average age

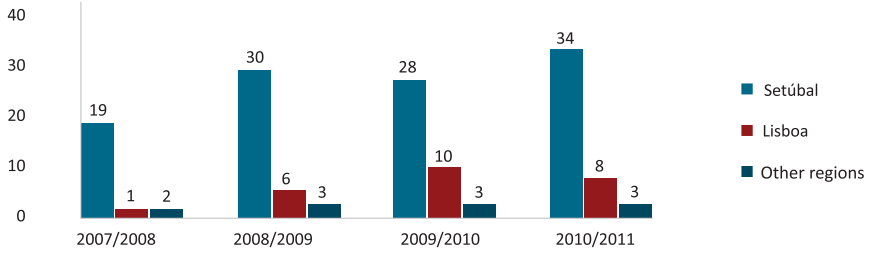

Fig. 3. Student characterization – distribution by region of origin

	Setúbal	Lisboa	Other regions	Total
2007/2008	86%	5%	9%	22
2008/2009	77%	15%	8%	39
2009/2010	68%	24%	7%	41
2010/2011	76%	18%	7%	45
Total	111	25	11	147

Tabela 3. Student characterization – distribution by region of origin

Academic Results

The results are presented below.

Teaching

Since in the final phase of the course many students who intend to pursue degrees, an option for candidates over 23 years old, choose to do only the curricular part of the course, and therefore measuring success by the number of DETCOP diplomas issued is not a realistic endeavour. Therefore, the criterion used in this study to measure academic success was the number of units effectively completed, and academic achievement per school year is illustrated in Figures 4, 5 and 6.

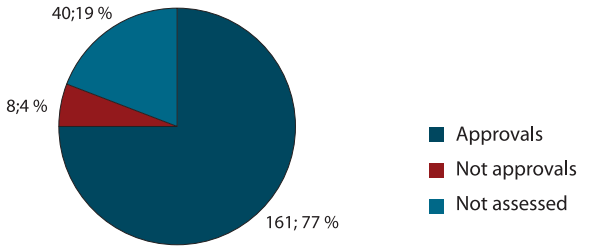

Fig. 4. Results for 2007/08

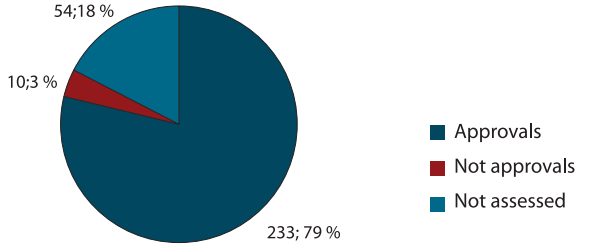

Fig. 5. Results for 2008/09

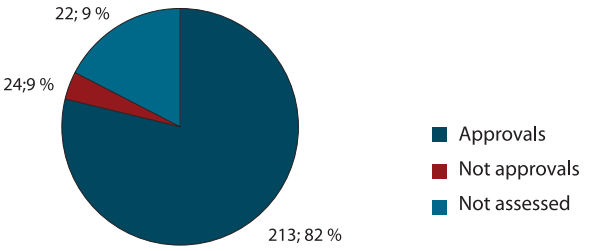

Fig. 6. Results for 2009/10

A further analysis of the academic success of this course can be seen in Table 4, which identifies, for example, the number of students with no units completed, which might be read as an early exit. On the other hand, a large percentage of students have completed all units.

Units Completed	2007/2008		2008/2009		2009/2010	
	No. of students	%	No. of students	%	No. of students	%
0	6	27%	9	24%	6	15%
1	0	0%	8	22%	13	32%
2	0	0%	1	3%	0	0%
3	0	0%	0	0%	2	5%
4	0	0%	0	0%	0	0%
5	1	5%	0	0%	1	2%
6	0	0%	0	0%	0	0%
7	0	0%	1	3%	1	2%
8	1	5%	1	3%	4	10%
9	2	9%	1	3%	1	2%
10	2	9%	1	3%	2	5%
11	10	45%	15	41%	11	27%
Totais	22	100%	37	100%	41	100%

Table 4. Units completed per year

Table 5 shows successful course completions.

Unit Concluded	2007/2008	2008/2009	2009/2010	2010/2011*	Total
12	0	7	11	4	22
11	10	17	11	0	38
Total	10	24	22	4	60

*Not verified yet

Tabela 5. Alunos de pleno Sucesso

Training in the workplace

Completion of internships takes place from September to April. During this period, students spend 600 hours on placement, accompanied by guardians - one for the host entity, responsible for the effective monitoring of the work and the other from the department, which assumes the role of teacher-supervisor and ensures that the work follows the outlined profile.

After the completion of the placements, internship reports are prepared and presented as evidence to a jury appointed by the Scientific Technical Council, to allow the trainees evaluation.

The other method of validating the work placement unit involves the submission of candidates with proven experience to a process of Recognition and Validation of Competences (RVC) by the Development Unit of Recognition and Validation of Skills of the Polytechnic Institute of Setúbal, established on 4 October 2007. This process is also related to the timing of training in the workplace . In all, nine cases were validated, since 2007 to 2009, through RVC.

Note that this Unit has recently been recognized as an example of good practice in Europe by the European Centre for Vocational Training (CEDEFOP) in its publication 'European Inventory of Validation of Informal and Non-Formal Learning 2010', based on an article by Ana Luísa Oliveira Pires, 2010.

	2007/2008	2008/2009	2009/2010	2010/2011*	Total
DETCOP	4	6	7	4	21

* Concluded the work placement and asked for the Diploma

Table 6. Students who have requested the DET

As previously stated, the number of DETs (Diploma of Technological Specialization) issued does not reveal the total number of workplaces filled, and 22 trainees have already been assessed in this context (Table 6).

In Section 5 of the Annex, we present the results of ongoing research which seeks to characterize students with regard to the training in the workplace, which was being developed at this time.

Employment

Throughout the academic years in which the course has been running most of the trainees, from about 80% in the first year to about 50% at present, were employees in the building area or were technicians employed in the public or private sector, and after course completion they will continue in the same fields. Others, thanks to the technical capacity given by the Diploma, are placed in small business companies where they perform internships, valuable with the status that these technicians represent to these companies. Yet, traditionally, those enterprises are organized in a familiar or empirical logic, they see in the trainees the more-value they need to take another quantum leap in their organization. We also noted the systematic search from higher education graduates in other areas, owing to their professional experience in building, entering in this course of Building and Public Works, because they find in it a valid output to improve their professional status.

In general, the employment rate, which in many cases means continued employment, is high: building companies, municipalities, railways, safety, hygiene and health in building enterprises, among others.

As a result of the crisis this industry is passing through at present, the relation between employment and work placement has fallen sharply.

Analysis of course operation and age of students on the Buildings and Public Work Course

On the one hand, the universe of students with work experience and assumed social responsibility, allied to a time lag in the resumption of studies, involves teaching new approaches and new methodologies, and on the other hand, it is important to know their opinions regarding the operation of the course and how to improve access to it. Accordingly, we conducted a questionnaire analysing the operation of the course.
Some of the issues addressed are exemplified below:
A1. Regarding the curriculum, did you note any duplication / lack of raw material? Details?
A2. Did you think there was a teaching overload in some subjects?
A3. What is your overall perception of the course?
A4.Would you recommend it to a friend?

In order to enrich the present work we present enclosed, a short summary of the answers of a questionnaire about the course. Note that an identical questionnaire was extended to the course teachers, seeking to understand how far there was a connection between the proposed training and what is actually learned. We leave to the reader the correct interpretation of those results in accordance with the objectives of this work.

Analysis of the results shows the students' maturity both in the quality of responses and in the relevance of the questions.

Conclusion

The course in buildings and public works is a course which, given the current critical situation of the sector, still maintains the initial levels of demand although the average age has been decreasing. The number of employed students has also declined sharply. On the other hand, younger students are looking to join this course as an alternative to management building and civil engineering degrees. Some candidates, who possess different qualifications of the same or a higher level, find in this specific course an alternative to professional valorization. We also identified strong demand by students, teachers and staff and also building agents who only want this particular course, believing that the expertise recognized by INCI is enough for their business needs.

Although there was a success rate of around 80% in the academic year 2007-08, 27.3% of students failed the course and 45.5% completed the course successfully.

The 27.3% of failures were because of dropout, absenteeism or change of course / institution indicators. In the following academic years the success rate remained slightly above 80%, although up to the date of the International conference "Higher Education Short Term: The CET and the Future", IPLeiria, 17 Junho 2011, there were no conclusive data on the school year 2010-11.

It should be noted that some students on civil engineering or building management degrees interrupt their studies to complete a SCHE (Short Cycle Higher Education) course and then resume their respective degrees.

Bibliography

Instituto Politécnico de Setúbal www.ips.pt

Escola Superior de Tecnologia do Barreiro www.estbarreiro.ips.pt

UDRVC-IPS http://www.ips.pt/ips_si/web_base.gera_pagina?p_pagina=25797

Processo RVC-IPS http://www.ips.pt/ips_si/web_base.gera_pagina?p_pagina=27407

FOR.CET http://www.ipleiria.pt/portal/ipleiria?p_id=24125

European Inventory of Validation of Informal and Non-Formal Learning 2010', based on an article by Ana Luísa Oliveira Pires , 2010.

Legal framework

. Decreto-Lei 70/93 de 10 de Março de 1993 - Estabelece o regime de criação, organização e funcionamento das escolas profissionais, no âmbito do ensino não profissional.
. Decreto-Lei 88/2006 de 23 de Maio de 2006 - Regula os cursos de especialização tecnológica, formações pós-secundárias não superiores que visam conferir qualificação profissional do nível 4.
. Portaria nº 1227/95 de 10 de Outubro - Regulamenta os cursos de especialização tecnológica.
. Portaria n.º 989/99, de 3 de Novembro de 1999 - Regulamenta os cursos de especialização tecnológica (CET), com as alterações introduzidas pela Portaria n.º 392/2002, de 12 de Abril.
. Portaria n.º 392/2002, de 12 de Abril de 2002 - Regulamenta os concursos especiais de acesso e Ingresso no ensino superior.