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TRAINING NEEDS IN CONSTRUCTION PROJECT MANAGEMENT IN PORTUGAL

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Abstract

Training in construction project management is an important issue in European construction industry nowadays. The need for training on this area has been felt by all project participants holding various academic backgrounds, yet working for a common goal, that is, project efficiency. Several countries in Europe, with special relevance to the UK, have greatly expanded training in this topic through academic courses, professional continuous development and experience improvement of practioners. Other countries have not yet achieved this stage but the need to prepare professionals to work in the open European market is impelling efforts for convergence in this matter. Lack of knowledge on this topic has been highlighted by several researchers in the literature. The Portuguese experience is scarce but a recent research project conducted by the authors reveals the main problematic factors for project success, namely, delays, cost overruns, lack of safety and insufficient quality. This calls for specific training on related management areas. This paper reports a survey on professional training needs in Portugal in the scope of an international project on management of infrastructure projects. The survey was carried by a questionnaire delivered to the construction stakeholders of participating countries. The Portuguese results show that the areas selected by the organizations inquired reflect the desire of the industry on more knowledge to overcome the issues approached by the mentioned project.

Keywords: training, construction, project management.

1. Competitiveness in construction

The construction sector is vital to the economic, social and environmental agendas of a country and consequently plays a critical role in the future of Europe. It is the largest industrial employer in Europe, with investments worth more than 900 billion euros, representing 10% of the GDP (EU-15, 2003) [1]. Moreover, it has multiple effects in surrounding economic activities.

Construction is typically a project oriented activity. Accordingly, project managers are responsible for planning and coordinating an assortment of activities while optimising cost, time, human and material resources so that the predetermined project objectives are eventually reached. Therefore, it is not surprising to say that productivity would benefit from enhanced management skills of project managers in the construction activity.

Significant research has identified a number of areas where sector performance could be improved, including better training and education, greater use of new technologies, better project management and innovative design [2]. Recommendations for assessing the competitiveness of the construction industry and for enhancing sector performance have been compiled by many

international researchers. In fact, the European Commission proposed recommendations for the improvement of the competitiveness of the European construction industry in a communication (COM(97)539 final) adopted in November of 1997, namely through priority actions in education and training provision, reorientation and reinforcement of R&D, regulatory environment and quality in construction.

The lack of knowledge on competitiveness in the construction industry has been felt by the Portuguese stakeholders. A recent research project conducted by the authors has revealed that delays, cost overruns, lack of safety and insufficient quality are the main problematic factors for project success[1]. Using these results, the research team at the University of Minho, plans to clarify the main reasons for the lack of competitiveness in the Portuguese Construction Industry and consequently outline the main path that hopefully circumvent interfering problematic factors.

One priority action lies in more investment in education and training of the workforce ranging from university educated professionals to poorly qualified site laborers. Indeed, because construction is a labour intensive activity, the workforce lies at the heart of the construction sector. Improved competitiveness relies on specialized professionals with updated skills in order to meet constant new requirements of an expanding global market that faces an ever-changing global climate.

Although coverage of the education system has improved dramatically international test scores suggest that problems with the quality of schooling remain [3] Table 1 illustrates the weak and strong points of the national construction industry.

Table 1 Weak and strong points of the national construction industry

Strong points	Weak points
Has considerable multiple effects in surrounding economic activities	Deficient training of human resources of upper management executives
	Weak innovation, investment, quality and productivity
Resistance to recessive periods in the economy	Weak internationalization of construction services
Recognition of competencies in the engineering area	Incipient investments in the maintenance /renovation sector
	Weak organization and business planning

source: http://www.gee.min-economia.pt

Deficient training has already been recognized by the Portuguese Ministry of Economy. Therefore, in order to ensure skilled workers and managers for an expanding global market, planned initiatives to enhance efficiency and quality education and to promote training are greatly required.

[1] ”Reasons for the lack of accomplishment of schedule, costs and safety objectives in construction”, financed by the Foundation for Science and Technology (FCT). http://www.civil.uminho.pt/fct

2. Training in construction

A project manager requires expertise in building science as well as in business and management. A good background on construction techniques, materials and regulations [4], together with know-how on contracts, procurement, specifications and other domains, is indispensable for achieving good performance in managing construction projects at all stages of the construction process. This calls for specific training on related management areas.

Several countries in Europe, with special relevance to the UK, have greatly expanded training in this topic through academic courses, professional continuous development and experience improvement of practioners. Other countries have not yet achieved this stage but the need to prepare professionals to work in the open European market is impelling efforts for convergence in this matter.

For instance, professional training needs in Portugal, Spain, Lithuania and Poland are currently being addressed in the scope of an international research project on management of construction projects, entitled "Recognition of needs and creation of the professional training in the area of preparation and management of infrastructure construction projects financed by the European Union"[2]. The increasing number of international projects in EU countries and pre-accession countries, connected with structural funds, requires better cohesion of knowledge amongst construction engineers and managers working on common projects. Therefore, the project aims at facilitating the understanding of management of infrastructure projects within member states of the European Union.

2.1 Survey to the industry

A survey was carried out between February and July 2005 through a questionnaire distributed to the various organisations operating in the construction cluster, in order to determine the type of training needed to overcome the lack of knowledge in this area. Portuguese construction engineers and managers validated the need for training in several management areas in the construction sector.

Although only 11% of the questionnaires were returned, feed-back from the industry was positive. Respondents were categorized in 6 distinct groups (Figure 1):

- Contractor: 43,33%
- Consultant / Project Manager: 13,33%
- Governmental Organization / Local Authorities: 16,67%
- Private Investor / Client / Developer: 23,33%
- Professional Associations related to construction: 0%
- Other: 3,33%;

From the list of management areas that had already been identified in a former research project [5] respondents were asked to select five relevant management areas (Table 1). Accordingly,

[2] Leonardo da Vinci vocational training action programme, project nº. PL/04/B/P/PP/-174 417. Project team: University of Minho (Portugal) Polytechnic University of Valencia (Spain), Vilnius Gediminas Technical University (Lithuania), PBCP – Polish British Construction Partnership (Poland) SIDIR – Polish Association of Consulting Engineers and Experts (Poland) and Department of Construction Engineering and Management at Warsaw University of Technology (the Promoter, Poland)

the following areas were endorsed:

- Project Cost Estimation and Cost Management;
- Planning and Scheduling;
- Quality Management;
- Health and Safety Management.

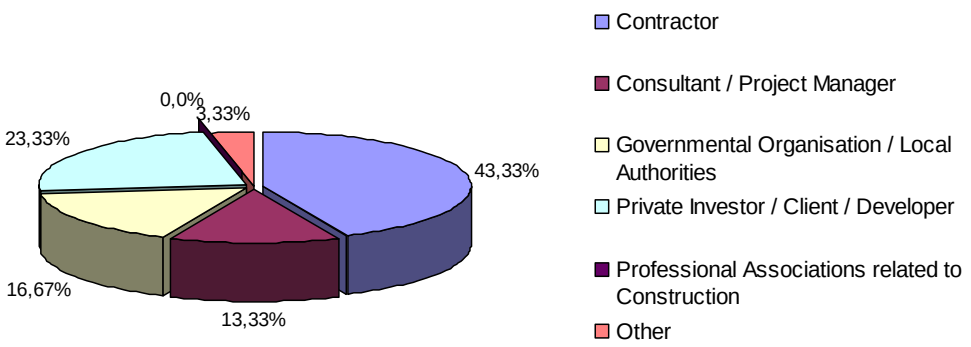


Figure 1 Weight of organisation type

Table 1.Number of responses/Organisation type in Portugal

Management areas	Contractors		Consultants / Project Managers		Governmental Organisation / Local Authorities		Private Investor / Client / Developer		Other		TOTAL	
Project's Conception Development / Feasibility	2	2,63%	2	6,90%	3	12,50%	5	11,36%	0	0,00%	12	6,67%
Planning and Scheduling	**13**	**17,11%**	**2**	**6,90%**	**4**	**16,67%**	**7**	**15,91%**	**1**	**14,29%**	**27**	**15,00%**
Risk Management	2	2,63%	2	6,90%	2	8,33%	1	2,27%	0	0,00%	7	3,89%
Corporate Marketing	1	1,32%	1	3,45%	0	0,00%	2	4,55%	0	0,00%	4	2,22%
Project Cost Estimation and Cost Management	**13**	**17,11%**	**4**	**13,79%**	**4**	**16,67%**	**6**	**13,64%**	**1**	**14,29%**	**28**	**15,56%**
Quality Management	**9**	**11,84%**	**4**	**13,79%**	**3**	**12,50%**	**4**	**9,09%**	**1**	**14,29%**	**21**	**11,67%**
Procurement and Tendering Procedures	4	5,26%	2	6,90%	1	4,17%	5	11,36%	1	14,29%	13	7,22%
Contract Conditions	3	3,95%	2	6,90%	1	4,17%	3	6,82%	1	14,29%	10	5,56%
Joint Ventures / Partnering	6	7,89%	0	0,00%	2	8,33%	1	2,27%	0	0,00%	9	5,00%
Health and Safety Management	**10**	**13,16%**	**4**	**13,79%**	**3**	**12,50%**	**3**	**6,82%**	**1**	**14,29%**	**21**	**11,67%**
Handing Over / Guarantee Period	6	7,89%	2	6,90%	0	0,00%	5	11,36%	0	0,00%	13	7,22%
Environmental Management	7	9,21%	3	10,34%	1	4,17%	2	4,55%	1	14,29%	14	7,78%
Other	0	0,00%	1	3,45%	0	0,00%	0	0,00%	0	0,00%	1	0,56%
Total	76	100%	29	100%	24	100%	44	100%	7	100%	180	100%

External courses are preferred by 43% of the organizations that have provided training courses (only 4% selected internal courses). Figure 2 illustrates the percentage of organisations surveyed which have already provided training in construction management for their staff and Figure 3 the type of training selected.

In addition, respondents revealed a strong interest for training in the above selected areas and predicted an encouraging number of participants for the forthcoming CPD courses currently being developed in the scope of the project.

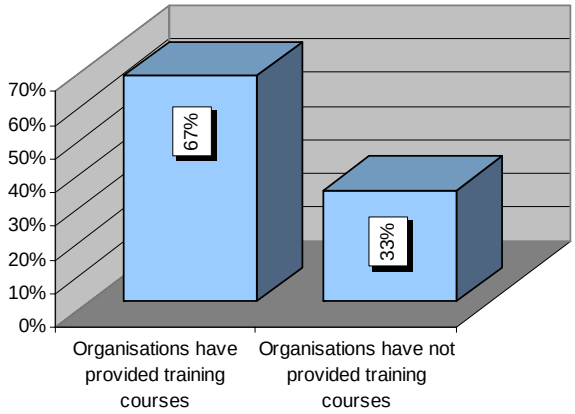


Figure 2: Percentage of organisations which have provided training courses in Portugal

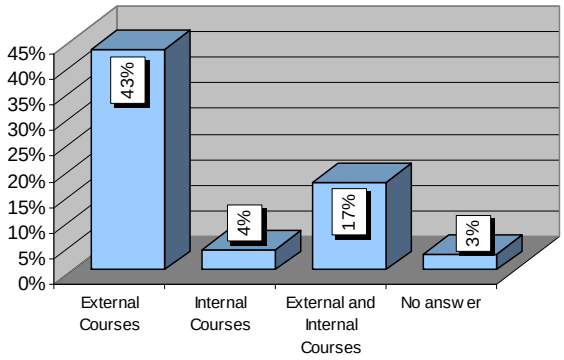


Figure 3: Type of training courses provided by organisations in Portugal

2.2 Focus Group results

The training needs of Portuguese construction engineers and managers were also assessed through a focus group meeting. The five most relevant management areas selected by the participants corresponded with results obtained from the questionnaire, despite the fact that "Project Conception Development/ Feasibility" was more quoted than "Quality Management".

Furthermore, participants were asked to measure the adequacy of the manuals by means of a scale: 1 (not at all adequate) to 5 (adequate). The numbers of answers, depicted below in Table 2, show encouraging results on the adequacy of the manuals currently under development by the project partners.

Table 2: Adequacy of the chapters

Chapters	Adequacy				
	1	2	3	4	5
Manual 1: Procurement and Contract Conditions in Construction			3	3	2
Manual 2: Planning and Scheduling in Construction				3	5
Manual 3: Cost estimating and Cost Management in Construction				3	5
Manual 4: Quality & Health & Safety Management in Construction		1	1	3	3

Moreover, participants went on to say that due to the internal economic recession in the construction sector, national competition has become more aggressive compelling companies to face the international market. Accordingly, in order to survive in a demanding environment, improvement of management competencies, productivity and competitiveness of the sector has become vital.

The increase of highly qualified staff contributes to the increase of more successful and efficient national development projects, and consequently, a more competitive national construction market. Therefore, construction companies and organizations have become more and more aware of the benefits of improving staff qualification and skills, especially in the management area.

However, the prevailing “improvisation” and “band-aid approach” culture makes implementing measures for skills improvement a difficult task in the construction industry in the country.

As for the current training levels, participants acknowledged that large size companies have more skilled and experienced staff compared to almost all of the medium and small size companies that have very low training levels. Thus, the overall conditions for procurement of construction services are influenced by the lack of perspective on excellence and qualifications as factors for project success.

Participants also acknowledged the fact that external courses are more sought out by companies rather than providing and organizing internal courses for their collaborators. Still, there is insufficient offer of specialized training courses that may interest engineers and managers in the area of construction management. The lack of recognition of training needs or biased diagnosis of market needs, resulting in ineffective use of time, cost and effort, may possibly be one of the factors that contribute to the scarce training in the management area.

As well as providing further support for our findings, participants emphasized the importance of courses to the various stakeholders of the construction sector and secured the interest for future training courses in management in construction.

2.3 Test course results

Course tests were also held in each partner country and assessed by participants using a questionnaire. In Portugal, the 4 hour test course, on part of Manual 3: Cost estimating and Cost Management in Construction, produced overwhelming results that have been summarized in the tables and figures below. Results gathered from the test course were used to improve the manual before final publication in June 2006.

The topics presented were classified by 57% of the participants as “very interesting” for managers in the construction industry (43% as “interesting” and 0% as “boring”) and 29% as “very interesting” for other professionals in the construction industry (71% as “interesting” and 0% as “boring”). Figure 4 illustrates these results. On the whole, 24% of course participants felt that they could learn “very well” using the manual, 62% “fairly well”, 0% “badly” and 14% did not know (Figure 5).

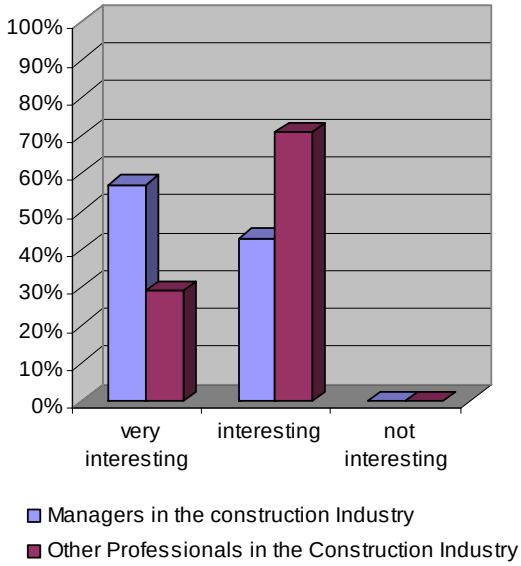


Figure 4. Interest / Usefulness of the topic

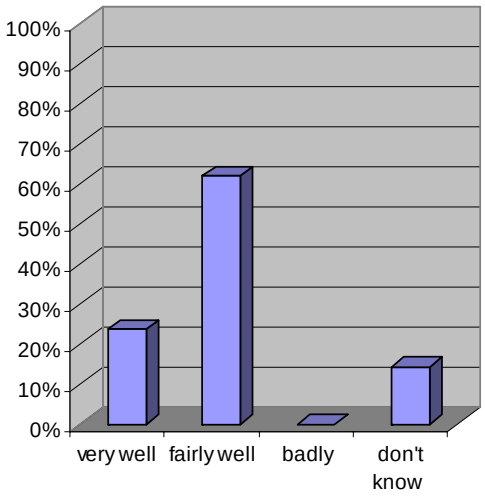
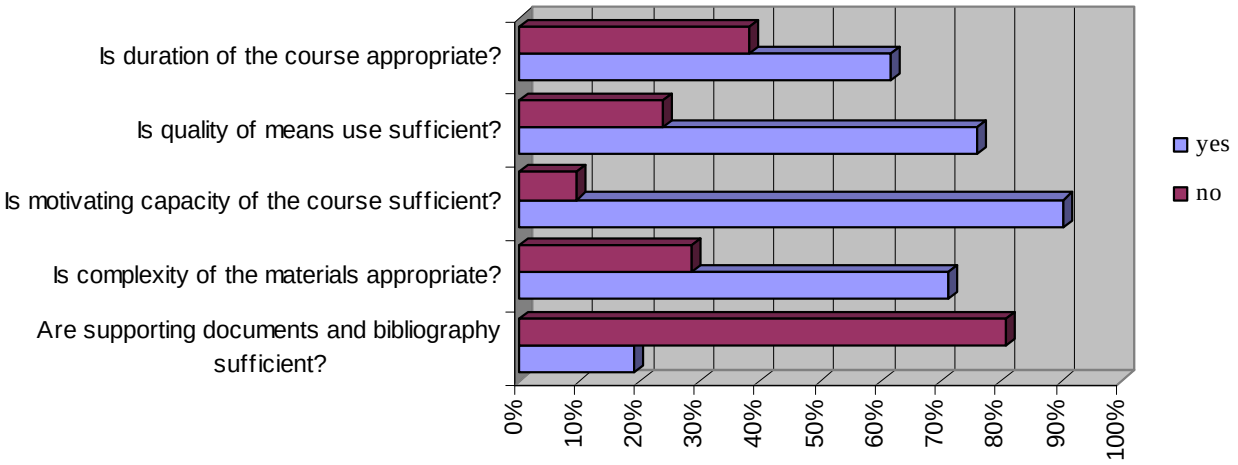


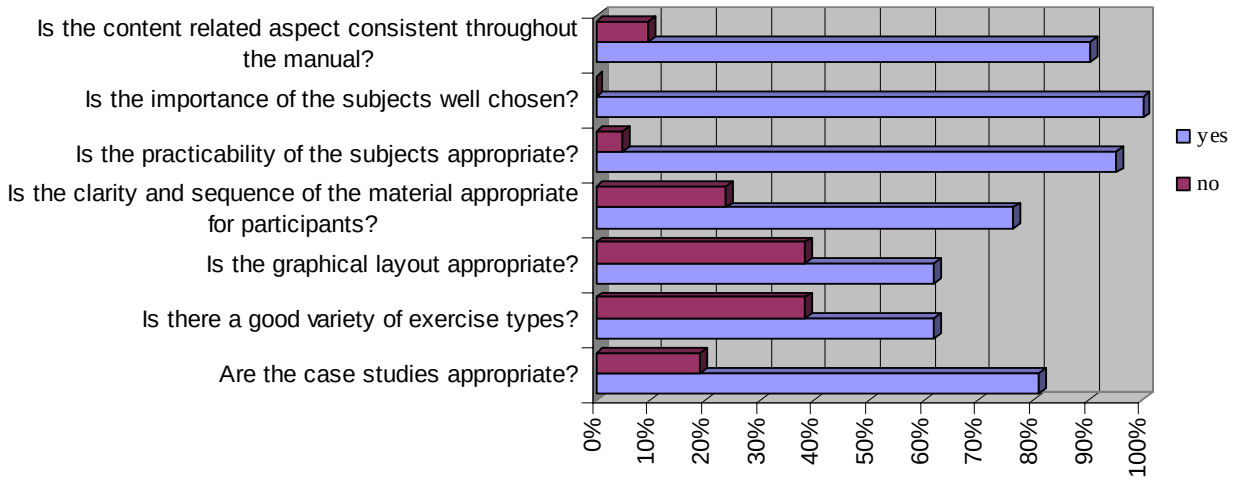
Figure 5: Learning aspects

Participants were also given the opportunity to assess the course as well as the contents of the manual. The following figures depict the assessment made by the course participants.



The course:	yes		no	
Is duration of the course appropriate?	**13**	62%	**8**	38%
Is quality of means use sufficient?	**16**	76%	**5**	24%
Is motivating capacity of the course sufficient?	**19**	90%	**2**	10%
Is complexity of the materials appropriate?	**15**	71%	**6**	29%
Are supporting documents and bibliography sufficient?	**4**	19%	**17**	81%

Figure 6. Course assessment



Manual contents:	yes		no	
Is the content related aspect consistent throughout the	**19**	90%	**2**	10%
Is the importance of the subjects well chosen?	**21**	100%	**0**	0%
Is the practicability of the subjects appropriate?	**20**	95%	**1**	5%
Is the clarity and sequence of the material appropriate for	**16**	76%	**5**	24%
Is the graphical layout appropriate?	**13**	62%	**8**	38%
Is there a good variety of exercise types?	**13**	62%	**8**	38%
Are the case studies appropriate?	**17**	81%	**4**	19%

Figure 7. Manual contents assessment

Other suggestions included deepening the material, adding more solved case studies, more exercises and extending the course hours in order to improve the course. Furthermore, 57% of participants recommend that the teacher's manual with key answers be published at the end of the manual, 29% as a CD attached and 14% as both formats.

3. Conclusions

The need for improved quality-based performance of construction projects highlighted the focus on more effective management. Consequently, training on construction project management has been considered an essential issue amongst construction stakeholders' world wide, especially in Portugal. The progressive open and competitive market felt by the Portuguese construction industry has enhanced the need for superior skills and competencies of managers and engineers involved in management of construction projects.

Accordingly, the training needs of Portuguese construction engineers and managers have been addressed through the LdV framework, and not surprisingly, results reflect the desire of the construction industry for more knowledge for promoting project efficiency.

Strategies for improving training needs should include, for instance:

- more investments and encouragement for continuous specialized training strongly directed to the real needs of the industry's stakeholders;

- better integration of management areas in engineering graduate or post graduate studies in order to provide better prepared students with the necessary skills and qualifications for management of infrastructure construction projects;
- further collaborative R&D projects between academic institutions and companies for new and more adequate management systems.
- approval of construction management evaluation for managers and engineers based on exam and curriculum results. Courses may be created in order to improve specific skills and to prepare participants for such exams.

Training in construction project management has in fact become an important issue in European construction industry. The authors expect that the LdV project will contribute for filling the knowledge gap felt in the management area of the construction industry. Measures are needed to strengthen human capital, enhance business environment and improve competitiveness.

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