TEACHING AND LEARNING METHODOLOGIES APPLIED TO A POSTGRADUATE EUROPEAN MASTER DEGREE IN CONSTRUCTION PROJECT MANAGEMENT

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Abstract

The European Union, through the Leonardo da Vinci programme, funds activities related to education and recognition of professional qualifications. Several European universities and professional associations participate in the project entitled "MBA in Construction - Postgraduate European Common Studies in Construction Project Management". The goal of this project is to create common postgraduate studies (at the Master of Science level) among several European universities (Warsaw University of Technology, Vilnius Gediminas Technical University, Technical University of Valencia, Poznan University of Technology, and the University of Minho) that could be accredited by the Chartered Institute of Building. This degree aims to acquire and refresh knowledge on various topics of managing construction projects, therefore enabling course participants to master their work and deepen their knowledge on those topics. The programme also aims to entice participants valorise their own experiences by creating communities of practice and networks. The course structure is modular, meaning that modules can be used independently of each other. Accordingly, tutors from any partner country can possibly plan the course sequence as required. Tutors will be also able to choose different types of learning approaches (from face to face to blended learning). Training modules will be made available on a common platform (Moodle). The proposed teaching and learning methodology is based on the following adult learning principles: learning is self-directed; it fills an immediate need and is highly participatory; learning is experiential (i.e., participants and the trainer learn from each other's); time is allowed for reflection and corrective feedback; a mutually respectful environment is created between trainer/tutor and participants; a comfortable environment is provided. Training techniques used in this programme include presentations, case study scenarios, simulations, and small group discussions, among others.

Keywords: Construction, European, Learning, Master Degree, Methodology, Project Management, Teaching.

1 INTRODUCTION

The learning process in advanced engineering studies has dramatically evolved during the last 20 years or so. Although the concept of "traditional learning" cannot be evenly defined as it changed through the history and between geographies, substantial differences may be found in the learning process before and after internet has started to be widely used for learning purposes. From this perspective, it can be stated that traditional learning was chiefly based on oral recitation from teachers to students during face to face sessions. Typically, students sat quietly at their places while the teacher delivered the lesson topics that should be further developed by students in subsequent individual or group study sessions taking place at home or elsewhere. Frequently, theoretical sessions and practical sessions were administered. The former were mainly devoted to the presentation of fundamentals (principles, theories, definitions, etc.) whereas the latter specially targeted the resolutions of case studies during which students could test their acquired knowledge.

Most of the engineers in their forties or more currently practicing in Europe went through the above learning pattern. Additionally, the relatively slow evolution in technical matters allowed engineers to cope with changes with a small updating effort and their basic knowledge enabled them to keep on working in practice through their life time. However, the dramatic increase in the use of Information and Communication Technologies (ICT) has demonstrated that this is no longer the case and the need for a much deeper updating effort has become evident to everyone.

The learning process nowadays relies on a very different model than the one described above. ICT has pushed the substantial reduction of face to face classroom contact, therefore reaching students located away from the school and allowing for the reduction of tuition costs – this effect has been compensated in many countries by the increase in the education cost share from students (Horn and Staker, 2014). Additionally, learning on technical subjects like engineering is now greatly focused on lifelong learning because of the need to continuously update knowledge in various fields (new materials and new technologies emerging, new management approaches being introduced, new areas of concern like health and safety, waste management, social responsibility and so on). Finally, multimedia is now encircling us in all our activities, thus demanding learning approaches other than oral recitation – subsequent study to be used for motivating students throughout their learning process (Bailey et al., 2013).

Accordingly, new learning approaches have emerged over the last few years. Some terms and definitions deserve some attention, as follows (Garrison and Vaughan, 2007; Glazer, 2011):

- Electronic learning (e-learning) comprises a wide range of applications and processes designed to deliver instruction through electronic means. This includes "online learning", "web-based training" and "computer-based training".
- Virtual classroom: This is an online learning environment. The environment can be web-based and accessed through a portal (e.g., Blackboard Collaborate) or software-based and require a downloadable executable file (e.g. Team Viewer). Under this approach, both trainers and students are logged into the virtual learning environment at the same time (synchronous learning). Virtual classes may also be asynchronous, meaning that trainers provide materials (lectures, tests, assignments and so forth) that can be accessed by students at any time in the future.
- Massive Open Online Courses (MOOCs) are web-based classes or seminars (webinars) supporting a large number of participants.
- Adaptive learning: Uses computers as interactive teaching devices. Computers adapt the presentation of educational material according to students' learning needs, as indicated by their responses to questions and tasks.
- Blended learning: Combines face to face classroom methods with computer-mediated activities to form an integrated instructional approach. This goes further than using digital materials (e.g., PowerPoint presentations) to help support face to face oral presentation instruction. A blended approach allows for using computer facilities in the process of learning (e.g., the learning session may be (repeatedly) visualized on-line by students (Horn and Staker, 2014).

Most of the above learning approaches are now covered by comprehensive Learning Management Systems (LMS) like Blackboard Collaborate and Moodle. These are software applications or web-based technologies suitable for planning, implementing, and assessing a specific learning process. A LMS typically allows for the instructor to create and deliver contents, monitor student participation and assess student performance. It may also provide students with the ability to use interactive features (such as blogs, messaging facilities, discussion forums, learning games with several players and so on) (Bailey *et al*., 2013). Additionally, the need for further accessibility and increased mobility has prompted the concepts of cloud based learning (under the notion of perpetual, universally accessible and scalable computer network) and mobile learning (whereby learning contents are accessed through personal pocket devices such as PDAs, smartphones and mobile phones).

2 BLENDED LEARNING

In view of the multiple learning approaches mentioned above, it may sound natural that difficulties have arisen in reaching consensus on some definitions (Glazer, 2011). E-learning and blended learning are two of the most discussed concepts in the literature, the lack of clear established differences allowing people to adapt and use terms as deemed adequate. E-learning is usually considered a broader concept than blended learning as the relevance of the latter follows from the advantages of the former which may be stated as follows (Garrison and Kanuka, 2004; Garrison and Vaughan, 2007):

- Improved open access to learning, including lifelong training programmes;
- Improved interactions between students and instructors;

- Provision of tools to enable students to independently solve problems;
- Acquisition of technological skills through practice with tools and computers;
- No restrictions on difficulty level, i.e. students can go at their pace;
- Cost efficiency;
- Helping students develop self-discipline.

However, some disadvantages of e-learning have been found making learning less effective than traditional class room settings, including (Garrison and Kanuka, 2004; Garrison and Vaughan, 2007):

- Ease of cheating;
- Bias towards tech-savvy students over non-technical students;
- Asynchronous communication hinders fast exchange of questions;
- Danger of procrastination;
- Unforeseen technical difficulties may impede learning.
- There are also several advantages and disadvantages with regards to motivation in e-learning;
- It's a flexible, self-paced learning method, allowing students to perform parallel activities (e.g. working);
- In asynchronous e-learning classes, students are free to log on and complete work any time they wish;
- Students may find hard to keep engaged along time (e.g., because of a work distraction) and the lack of face to face classes doesn't help to overcome this problem.

Blended learning aims at benefiting from the advantages of e-learning while overcoming its disadvantages by keeping face to face communication and direct interaction amid students (e.g. through group work studying). Actually, blended learning incorporates asynchronous internet communication technology for facilitating simultaneous independent and collaborative learning experience but does not preclude face to face classroom interaction with modern multimedia facilities as an efficient means of learning. Therefore, although blended learning may be difficult to fully define, the following simple statement of "blend of IT technology with face to face teaching" seems adequate to the current purpose.

Note that the concept of blend has long been introduced in the learning terminology. Through the 1990s the corporate training world spoke of blended learning as an enhancement to the typical corporate training intervention i.e., the short course. Corporate researchers and practitioners noted that technology enhanced learning alone was not enough, arguing that people would need experiential learning for the mastery and retention of knowledge and skills achieved through the blend of technology and face-to-face interaction. In the last few years, short courses have been expanded by pre-course readings and post course activities, such as action-learning sets and project-based learning teams embedded in learning in the workplace. Short course participants also received electronic materials (e.g. spreadsheet-based project finance models, trading simulations, technical process modelling, etc.), on portable media, initially floppy disk, later CDs and eventually through web services. From the year 2000, web based distance learning and training was being blended with supplementary printed manuals and optional face to face seminars "at a location close to the target group". Summarizing, three meanings for the term blended learning may be identified: (1) The integrated combination of traditional learning with web-based online approaches; (2) The combination of media and tools employed in an e-learning environment; (3) The combination of a number of pedagogic approaches, independently of learning technology use. The following are the characteristics of blended learning as it is practiced today (Stein and Graham, 2013; Bailey *et al*., 2013; Horn and Staker, 2014):

- The provision of supplementary resources for learning programmes that are conducted mainly in the traditional way, through institutionally supported virtual learning environments;
- Transformative course level practices underpinned by radical course designs which often make significant use of technology to replace other modes of teaching and learning;
- A holistic view of technology and learning, including the use of the learners' own technologies to support their learning.

- E-learning material will be structured in “Modules” to be made available to the beneficiaries and tutors via “open source” technology - LMS. From previous experience of the project team, Moodle platform has been selected for this purpose.

3 AIMS OF THE TRAINING PROGRAMME

The programme aims to acquire and refresh knowledge on various topics of managing construction projects, therefore enabling course participants to master their work and deepen their knowledge on those topics. The programme also aims to entice participants valorise their own experiences by creating COPs (communities of practice) and networks. The course structure is modular, meaning that modules can be used independently of each other. Accordingly, tutors from any MBAIC partner country can possibly plan the course sequence as required. Tutors will be also able to choose different types of learning approaches (from face to face to blended learning). Training modules will be made available on the LMS platform (Moodle), meaning that beyond paper version and electronic CD-ROM versions, learning materials will be made available on the e-learning platform.

4 TRAINING METHODOLOGY

The proposed teaching and learning methodology is based on the following adult learning principles:

- Learning is self-directed;
- It fills an immediate need and is highly participatory;
- Learning is experiential (i.e., participants and the trainer learn from each other’s);
- Time is allowed for reflection and corrective feedback;
- A mutually respectful environment is created between trainer/tutor and participants;
- A comfortable environment is provided.

Training techniques used in this MBAIC programme include the following:

- Presentations - activities conducted by the trainer/tutor or a resource specialist to convey information, theories, or principles (workshops);
- Case Study Scenarios - written descriptions of real-life situations used for analysis and discussion (workshops and e-learning);
- Simulations - enactments of real-life situations (workshops and e-learning)
- Small Group Discussions - participants sharing experiences and ideas or problem solutions (workshops and e-learning).

5 BLENDED LEARNING MODULES AND FRAMEWORK

The process of defining a training module involves different actors and activities. The main actors and their corresponding tasks are sketched below:

Actors	Tasks
Expert of domain/content	Developing contents in the form of didactic material
Tutor/trainer	Providing training support to the learner
Learner	Learner, the target end user

In order to achieve the aims and objectives of MBAIC training scheme, the overall programme has been divided into 10 modules comprising the topics of previous didactic materials developed in the framework of the Leonardo da Vinci set of projects “Common Learning Outcomes for European Managers in Construction” (CLOEMC) parts I, II & III that merged the same partners as in MBAIC for successfully developing those materials. The learning modules included in MBAIC learning set are as follows:

- IT support for construction projects;

- Cost and time management in construction;
- Site Management;
- Risk and Value Management;
- Management of Infrastructure Projects;
- Human Resources Management in Construction;
- Chosen issues of Construction Project Management;
- Health & Safety, Environmental and Quality Management;
- Procurement and Marketing;
- Legal Aspects in Construction.

The preparation of the training modules has been developed on the basis of the framework – "descriptor for training modules" specific to each module and "pre-requisite table" standard for the whole programme and to all modules of the MBAIC training set. Each training module is developed according to the framework depicted below.

Title	The best possible explanatory module title.		
Main target audience	The end user of the module, people to whom the training module is directed to.		
Description of the module and general aims	(self-explanatory)		
Training/learning time	Overall time foreseen for learning (e.g. 2h).		
Duration period	**Maximum duration**		Maximum duration of training for the module
Learning approach	**X**	**Face to face learning**	IT …… hours of training Verbal …… hours of training
	Y	**e-learning** (online learning, web-based training, computer-based training, etc.)	Synchronous …… hours of training Asynchronous …… hours of training
	Z	**Case studies** (hands on)	… hours of practical training
Tools required to carry out the module (ICT, equipment, etc.)	Face to face learning: IT equipment & tools e-learning: IT equipment & tools		
Learning objectives (LO)	Describe specific learning goals i.e., what is going to be trained and will be learnt by trainees after the successful completion of this module. Once you have completed this module you will be able to: LO(1): …; LO(2): …; LO(3): …;… Note: Each learning objective is to be expressed by means of predicates for detailing the deepening level, following 6 level Bloom's Taxonomy: (1)Knowledge, (2) Understanding, (3)Application, (4)Analysis, (5)Synthesis, (6)Evaluation.		
Pedagogical methods used (self-study, group work, distance learning, etc.)	List the type of activities associated to the learning objectives or considered useful for the training of each module or part of it.		
Evaluation and KPI (Key Performance Indicators)	Evaluation can be accomplished by measuring factors which expresses the learner's performance in reaching a LO, e.g. KPI(i) related to LO(j)…		

6 TRAINING PROGRAMME

The blended teaching methodology (comprehending face-to-face learning and e-learning) best takes into account the possibilities and needs of the learning target group. The training programme ties up previous experiences of the target group with e-learning and works out the development of competencies in content and usability of ICT tools in special didactics of blended learning. The resulting course will enable stakeholders and interested communities to develop and carry out combined training faster and in a more extensive way and to some degree at a higher comparable quality level.

Face to face presentations are supported by didactic materials (e.g., manuals, case studies, project reports and so on) developed in previous projects in the framework of the Leonardo da Vinci programme, namely "Common Learning Outcomes for European Managers in Construction"

(CLOEMC) parts I, II & III support. Additionally, presentations (e.g., using MS Power Point) have been extensively prepared in the scope of MBAIC for supporting the tutor's action during sessions. The use of the LMS platform (i.e., Moodle) must be shown to course participants who should be encouraged to proceed using self-learning facilities provided therein. It is the tutor´s duty to operate the technical equipment during face to face sessions and the e-learning facilities under the LMS platform. The training modules are designed to include a number of training hours and related schedule – calendar (see framework for each training module). Blended learning comprises three main phases:

- Preliminary Phase: In the preliminary phase, which starts few days prior to the first face-to-face session, participants get basic information about blended learning. They have the first opportunity to get to know their course colleagues and identify themselves as IT competent or IT non competent learners. IT competent learners have already got into contact with various technical tools suitable for blended learning courses such as (a) synchronous communication user interactions (chat, forum, and VoIP). All participants get the necessary information to successfully use e-learning tools. This is provided by experienced tutors.
- Face-to-Face Sessions: In face-to-face sessions, technical and instructional knowledge are transmitted by using different didactical methodologies. Moreover, a project work (content) is initiated to be finalised during the follow-up phase in e-learning and e-tutoring for IT-competent. The IT not competent learners will continue the course in face to face sessions with the tutor operating the IT tools, following workshops, exercises and evaluation in presence.
- Follow-up Phase: The IT competent participants continue to work in a collaborative approach on their blended learning course using communication tools and e-learning environment (Moodle). The work will be supported by an online tutor. Regular online sessions give the participants the opportunity to get advice and information from other group members and the tutor and will promote an exchange of experiences and good practice. Particular attention will be paid to monitoring learners' interactions and progresses in the Moodle platform by means of logging data and specific tools.

7 CONDITIONS FOR PARTICIPATION, ADVANCEMENT AND COMPLETION

Decision makers at strategic levels, executives and staff dealing with construction projects in their every-day life and students interested in a project management career will benefit from the course. All participants will be awarded an internal certificate of attendance at the end of the training programme. Participants successfully completing the course will be awarded a certificate of completion issued by the institution providing the course. Additionally, successful participants may also be awarded a set of learning credits (e.g., ECTS) that may be used in a diploma scheme from the issuing institution. High level of flexibility is allowed in the implementation of the training programme. Flexibility refers to the selection of methods of delivery as well as to the time schedule of implementation. Considering that the programme will be delivered by different educational providers in different countries, different socio-economic-cultural contexts with different learning requirements will be involved. Each individual educational provider will explore the best-fit method of delivery considering the context, the content and accessibility to digital facilities and IT competences of participants.

The basic concept in innovative training is the fact that experiential learning will be used, meaning that the learning process will use the experience of the participants and will be more efficient in terms of attractiveness and usefulness in the future activities performed by participants. Most of the participants - target group - are very busy and do not have the time to attend long formal training schemes. One of the aims of this training programme is to implement a learning solution that will not deprive participants of their free time in order to increase their skills and abilities (IT competent and e-learning methodology). The implementation of blended learning includes the allocation of different types of learning solutions in order to assure flexibility of training design and development of a sustainable training approach.

Training evaluation will be based on the accomplishment of the learning objectives assigned to each module and on other usable methods. Some exercises and tests will be assigned to learners at the end of the learning programme in order to evaluate the learning level of each specific module. A number of key performance indicators (KPIs) will be defined in the specific subject of each module and measured in the assessment (framework descriptor). Moreover, other parameters concerning the (effective) use of e-learning platform will be used in order to measure the training evaluation, such as the frequency of use or the regular flow of study activities.

8 COURSE PLANNING – TUTORIAL FOR TRAINERS

The course is designed to help decision makers, executives and staff dealing with construction projects to improve their management abilities and to train students and young professionals wishing to engage in the project management profession. Accordingly, the course will allow for increased awareness and greater knowledge on the concepts of modern project management in the construction activity. Expected course learners are:

- Need to develop their knowledge and skills in the project management area;
- Need to extend and develop their knowledge in project management legal procedures;
- Have limited time available for study, and can develop strategies to enable them to take control of their own learning.

In order to satisfy learners' needs, the following section provides trainers with information and checklists that can help them get started in blended learning. It broadly describes the processes of producing and delivering a blended learning course and explains differences to the traditional face-to-face learning. Generally speaking, blended learning combines e-learning with typical classroom training, merging the best aspects of both (24h accessibility and face-to-face interaction). Blended learning involves activities in the classroom, independent personal study and interaction with peer learners and tutors. A combination of different tools is used in accordance with the requirements of the learning processes.

When starting a course, the trainer may use a face to face or a distant approach depending on learners, i.e. according to their experiences and their dexterities. Distant activities may be interchanged with face to face activities for preventing possible isolation feeling from learners and to encourage them to pursue in the case of disappointment. Actually, trainers mainly act as facilitators rather than as conventional teachers.

Content is presented to learners in different formats (text, power point presentation, flash animation with audio or video overlay, interactive exercises, etc.). Periodically, learners are given opportunities to practice what they have learned. These activities typically contain instructions for performing an activity and subsequently respond to questions on the activity performed. Learners can then compare their own answers with those from the course authors.

Whenever trainers/tutors prepare their courses, they are making a series of decisions aimed at creating a "design," or a sequence of activities for learners to follow. When making the necessary decisions, the following should be kept in mind: a) meet the needs of the actors (learners, facilitators, tutors, authors, support persons); b) meet the requirements of the learning process; c) take into consideration the technological infrastructure available; and d) take into consideration the resources available. One of the most important factors for success is to respond to the personal development needs of target groups/end users. In order to achieve this, the following questions are to be answered:

- Do you know who your learners are? Learner needs: Ability levels; IT competences, backgrounds; interest level; attention spans; ability to work together in groups; prior knowledge and skills, attitudes and learning experiences; special needs or accommodations; and learning preferences
- Where do you want to go? Course goals: What would you like learners to gain out of this course? Foundational knowledge (facts, principles, and concepts), applications (thinking skills, managing complex projects), integrations (connecting ideas, information), understanding the personal and social implications of this subject, making changes in their feelings, interests, and values? Identify the aims or outcomes that you expect your learner to achieve as a result of his/her participation. These goals are formalized in the framework table as Learning Objectives for each module
- How will learners and yourself know if course objectives have been achieved? Objectives: Objectives are behavioural in nature and are specific to performance. Objectives tell what you will be observing in each learner's performance and describe criteria by which you can measure performance against. List the important facts, key concepts, skills, or key terms and glossary that you intend to cover. How will you and the learners know if they have achieved these objectives? You can also prepare an outline with key learning outcomes. What kinds of interaction, feedback and assessment would be appropriate? Objectives represent tangible indicators of performance that tell the trainer, to what extent a learner is progressing in any given task. These are represented in the framework table as KPIs for each module.

- How are your students going to reach the objectives? Content: What type of learning activities and experiences do learners need? Learning activities can range from easy to hard tasks, depending on learner abilities. Select or develop learning activities that reflect the principles of active learning. What resources will the learners need? How will they have access to the content? What type of reflective communication will help them with the content and connect it to their own lives? Examples: Html pages; videos; sound files; documents; external resources; printed material from the manuals.
- What are the key concepts in this course? Major topics: It is important for the trainer to identify 5-7 major key-ideas, topics, or themes in the course. Place them in an appropriate sequence and create a thematic structure (units) for each course module. Some hints are: (a) set up the module pedagogical basis and theory background; (b) select the major key-ideas of the module; and (c) sort the main topics of the module into a chronological order: present them by using a directed flow graph.
- What is the overall course structure? Instructional strategy: What activities need to come first? How should the course begin, with face to face or distant activities? Which should be the sequence of activities in the middle of the course - e.g. self-assessment test? What activities do you want to conclude with, i.e. how should the course end? Describe or list a focusing event (attention grabber) that will motivate learners to pay attention and learn about the course contents. This will depend on the learner's interests and backgrounds. List or describe ways in which you can wrap up a lesson. This can include telling learners the most important concepts covered in the module/course, asking them on their views on the key concepts (or what they learned) and preparing them for the next module building upon what has been presented so far. The key is to leave your learner with an imprint of what you expect to achieve in any lesson. An example structure is:
    - Induction meeting: A face to face meeting about the course goals and contents, and the supporting materials.
    - Learning materials: to be used by the student distantly or in presence, covering a specific training module.
    - Knowledge assessment test: It can be a quiz, a crossword, or an activity /assignment that the students have to do and/or submit to their tutors, possibly executed online.
    - Case study – project: Students working in groups or on their own deal with practical situations.
    - Simple questionnaire: Used at mid-point and at the end, seeking student feedback on the course and its delivery.
    - Final meeting: A face to face meeting about the course completion targeting to unravel possible student's questions and/or misunderstandings; and also to guide the students to future learning needs.
    - What will the learners need to do? Learning activities: Identify the specific learning activities in a particular sequence (e.g. look/do, read, hear/talk, write, search/research, study/do, cooperate/group do, feedback) usually laid out over a time span (e.g. 1-3 weeks). Each learning activity could plan for face to face or/and distant learner's elaboration. List or describe ways in which you will provide opportunities for your learners to practice what you want them to learn. The more opportunities you provide, the better the chance they master the expected outcomes. List and grade a set of face to face activities in agreement with your learners:

	Activity types	Pros (+) and Cons (-) for the Learners	
		(+)	(-)
1	Panel of experts	present different opinions; discuss in a structured way; keeps their attention	may not be good speakers; may present subjects in a “strange” order
2	Small group discussion	easy to participate; feel comfortable; deals with group consensus	not easy to define the groups; preparation of small tasks or questions for each group
3	Case study	develops problem solving skills; explores complex issues; applies new knowledge and skills	not easy for the course designer to prepare a well- defined case study
4	Role playing	involves the learners in experimental learning practice skills	some of the learners may be too self-conscious and feel threatened
5	Worksheets and surveys	thinking without interference by others (individual thoughts can then be shared later)	preparation of hand-outs

- List the ways they may be used for on-line activities:
- What will be the course supporting tools? Apart from the course content you need a series of supporting tools for course delivery. It is possible that some of the tools could also be used in the learning process (e.g. chat), therefore a clear distinction is needed between the use of a tool in any case. List a set of on-line tools (e.g., forum, chat, wikis, blog, messages, notice boards) and take into consideration their pros and cons, namely:

	Activity types	Pros (+) and Cons (-) for the Learners	
		(+)	(-)
1	Activity worksheet	provides guidelines and hints; encourage the self-learning	preparation of the worksheets
2	Forum	discuss using arguments; provides the written word	forum administration; it’s not clear if an opinion is absolutely personal or is copy-pasted
3	Chat	trendy; provides written word; fast way of interaction	usually, there is a lot of irrelevant discussion
4	Wikis	cooperative document creation	wiki’s administration; need acquaintance for tutors and learners
5	Blog	easy to post an article; time recording	blog administration
6	Messages	personalized; focusing on specific issues	-
7	Notice boards	easy for general information	-
8	Calendar	familiar to learners	must take care of deadlines

- Are there enough human resources? Human resources: In general, the course is mainly the collaboration outcome of four (4) groups sharing distinguishable roles: (a) administrator: administrates and manages the electronic platform used to make available the educational material, ensures the availability of computer resources, applies safety policies, monitors

backups etc. (b) domain/content expert: develops the educational material using authoring tools and follows suitable models for course description. (c) tutor/trainer: delivers the educational material through face to face and distant learning sessions; collaborates with course creators during the development of educational material. (d) learners/students: participants who attend the course.

- How will you know how the course is going? How has it went? Evaluation: What kinds of feedback will you need? List or describe ways that you will check for understanding. Assessment and ongoing feedback are necessary for monitoring progress. This can include questioning, conferencing, or journal writing/reflection writing. Example of actions to be undertaken on this subject:
  - Define the degree of achievement of the course objectives;
  - Check if the proposed activities are effective enough or if changes are needed
  - Ensure effective interaction among tutors and learners
  - Check learners' satisfaction with the teaching approach
  - List a set of ways that may be used for feedback and evaluation, for example:
    1. Quick assessment: Ask your learners (online or offline) about a simple question, e.g., what is the most important issue they have learned in a specific session.
    2. Post-questionnaire: Provide an online or offline questionnaire (quiz, crossword, fill in the blanks etc.) addressed to learners aiming at recording the knowledge raised up after the module/course.
    3. Outside observers: Ask someone not involved in the module/course design.
    4. Learner's interview: Use online interviews; learners may take interviews each other as well.
    5. Video recording: Record some class sections in order to study the class behaviour later.
- What has worked and what hasn't and why? Reflection: This section is to be completed after the course. It is meant to give you some insight into practice and will hopefully help you make adjustments and modifications where necessary. List a set of tools that may be used for collecting reflection information, for example:
  - Observation sheet: The tutor is keeping some notes during the course; it may be a kind of daily journal.
  - Questionnaire: It is addressed to the tutor and asks about things that have worked and thinks that haven't.
  - Video recording: Activity recording during face to face learning.

9 CONCLUSIONS

Against the dramatic evolvement of IT's over the last few years, partners within the "MBA in Construction - Postgraduate European Common Studies in Construction Project Management" European funded project have faced the challenge of providing adequate learning materials to engineers currently working in the industry. Actually, although most of these professionals have gone through traditional learning methods, the learning process nowadays relies on a very different model, essentially pushed by ICT developments. Most of this process is covered by comprehensive Learning Management Systems (LMS) easily accessed by a number of distinct mobile devices. In view of the above, a blended learning approach comprehending face-to-face learning and e-learning has been followed in this course, thereby matching student's learning requirements. Additional to course material preparation, the project team has developed a comprehensive tutorial for trainers briefly explained in the paper. The tutorial is expected to contribute for course success and an essential component of this is to help trainers appropriately answer a course monitoring questionnaire also explained above.

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