



Project Management in educational institute

By

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A THESIS REPORT

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BIOGRAPHY

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Maria Makrigianni works as an educator to an educational institute in Athens. The purpose of this institute is to educate persons that have finished high school and they do not want to study at a university or they did not have the opportunity to study to at a university. Through the courses students acquire more technical knowledge on the section that they have chosen.

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Abstract

Project management education has been developed and its purpose is to educate project managers in order to manage and to overcome easier the problems that they will face to the projects. Construction projects are difficult projects and they have differences from other projects, so the problems that are created and have to be faced from the project managers would be more easily confronted if the resources of the construction project would be also educated and informed about the project management and the basic project management's theories.

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1.0 Introduction

1.1 Nature of the Study

Construction companies undertake projects that are difficult and they usually have a great amount of employees and subcontractors that are working for them. Often construction companies deal with problems with builders, electricians, and subcontractors because they are not following time schedules or they do not follow the instructions that are given for certain tasks. Construction projects are very big and take place to big areas, so much of the time workers are not supervised by anyone. This causes problems with the time, quality and cost of a project.

Construction companies use to re-educate their engineers but not their technicians, who compose a great amount of the personnel of the company and certainly companies cannot re-educate subcontractors.

1.2 Needs Assessment

This thesis will help all the similar institutes to understand that the technical knowledge that they offer to the students is not enough even for a technician. Even if the companies in Greece operate still with Fordism and Taylorism Theories this might be changed in future and the purpose of every educational institute is to give knowledge that will be useful and necessary now and in the future.

1.3 Purpose of Study

My purpose is to show the importance of the technicians acquiring the basic knowledge of project management.

1.4 Significance to my workplace

As long as it concerns my workplace I would like to contribute to the improvement of the educational program of each section. The educational program should be updated according to the present and future requirements of the labor market, so the quality will be improved and the students will have more skills which will not be only technical. This will help them to feel more secure in their future workplace and it will improve the quality of the educational programs of the institute.

1.5 Relation to the Program of Study

During 501, Introduction to project management, it was mentioned that everything can be faced as a project and project management was developed the last decade because of certain factors like competition, evolving technology, and the availability of a high skilled temporary labor force. In Greece project management is being developed but with slow rate of attainable growth. Of course in most universities courses are introducing project management, and several companies are making seminars for the employees that concern project management, but project management will be faster expanded in Greece if an introduction of it takes place in every educational institute.

PM 511, Project Quality Management, stated that quality is very important in a project, so with the proposal of project management as a course, the quality of educational programs will be improved, because education will be provided on an important topic and the students will not have only technical skills, but they will be able to understand the managerial part of the constructions projects, too.

During 512, The Customer in the Project Process, we had emphasized that the customer is a very important stakeholder in a project. So, if it is considered that in this case that customers are students, the project is the educational program and the project scope is to create good professionals, then it is important to teach project management.

1.6 Definition of terms

In this proposal will not use special terms. The thesis will contain systems archetypes definitions.

2.0 Problem statement

2.1 Problem

The lack of information on project management in an educational institute in the section of technicians (builders, foremen, electricians, plumbers) training for the construction industry causes problems with the timeliness, the quality and the cost of the construction projects.

2.2 Rationale

I believe that it is very important for the technician in a construction project to consider the importance of the project and to be informed about all the consequences that can follow if the project plan is not being followed. Most of the time the technicians are informed about the time schedule of the project during the construction and about the quality goals of the work but they ignore them.

The results are quite obvious. Construction projects are very difficult because their duration is long, the quality is very important and they occupy a great amount of people. The builders should be informed about project management, how it works and how effective it can be in organizing the work.

Technicians should be well educated about project management and for their technical issues, in order to be able to collaborate with other workers and to follow the plan so that

the department of construction projects will not be delivered late and over budget.

So I believe that project management is an important element for the education of the technicians because this will also help project managers to organize their work more easily and to have less concern about the success of their projects. Project management is also important because a big part of success of projects is dependant on effective teamwork and on good information being available to all of the stakeholders of the project.

2.3 Hypothesis

The program of education should be changed in the technical institute to include project management otherwise the construction companies will be composed of technicians that are uninformed about projects and this will threaten the success of the projects; the projects will continue to be delivered late and over budget.

The technicians should be aware of the consequences of the ignorance of the project plan and they should also be collaborative because teamwork is very important in these projects.

3.0 Literature review

3.1 Overview

The following literature review indicates the importance of project management in our days and the factors also that caused the development of project management. Also this literature review shows how project management has been developed. In this part of the literature review I want also to show the importance of the project management in constructions. The following literature review indicates also that project management education is very important and they describe that companies and universities have increased project management education. Everything that is applied to universities and to companies should be applied and to all the educational institutes which are preparing students to become professionals.

3.2 Development of project management

According to Kerzner (2008) Project management began to be needed the last forty years in order to be delegated better the responsibilities in a company.

Especially in the middle of 1960 companies that had to deal with project that were particularly complex such as aerospace, computers, were trying to discover new management techniques.

So later in 1970-1980 project management as its formal process was adopted from the most of the companies because their projects were getting larger and more difficult.

"So the growth of project management has come about more a necessity than through desire." (Kerzner, 2008, p.37).

Verzuh points out that project management has been increasingly developed the last two decades; this has been caused due to certain factors that have been changed:

- Competition is developed in a global field.
- The rapid development of the technology
- "The availability of a highly skilled temporary labor force ." (Verzuh, 2008, p. 4).

However "over the past 10 years, various standards have emerged and have helped to increase the degree of professionalism of project management." (Thomas & Mengel, 2008)

3.3 Project management education

In our days the structure of the organization has been changed due to the use of project management process the traditional organization has been changed to matrix or to projectized organization structure.

Of course the adoption of the project management principles and the change of the organizational structure have developed the project management education, so in many universities project management is included as course or it is included as master and except from the studies many organizations are organizing training for their employees.

"Global changes influence the project environment, client relationships and the behavior of suppliers. The people managing projects (the project management community of practice) are increasingly important, requiring professional development and training."(Mehmood, Gale, Brown and Kidd, 2008).

Thomas and Mengel indicate that in over 15 universities project management education is being offered online in a Master program or in sometimes is being offered in a certificate or doctorate program.

So "project management is becoming increasingly very important for universities and management educators."(Berggren & Söderlund, 2008)

Great efforts have been made in order to improve the project management education to prepare them to confront the complex projects and to be able the managers to deal with problems that they will face in the project implementation.

So Berggren & Söderlund are suggesting an educational model "based on a "social twist" of experiential learning theory and discuss six learning modes of how to rejuvenate, stretch and improve project management education" (Berggren & Söderlund, 2008). So an improvement in the project management education as it concerns the interesting and rigor of it is being made.

Also many educational programs in project management have been started in collaboration of a University and organizations,

such as "the academic-industrial collaboration between The University of Manchester (UoM) and Rolls-Royce, AMEC, Goodrich and EDS with some guest organizations participating also."(Mehmood et al, 2008).

So many organizations are also interesting in the training of their employees in order to be developed and to acquire very well trained personnel which is a significant advantage.

"Expenditure on training and education represent an investment for which there would be the expectation of a return deemed beneficial to the organization. It would be expected that Return on Investment (ROI) would be a fundamental consideration."(Mehmood et al, 2008).

Also the concern of the organizations to provide training to their employees has an impact to the some educations institutions like the University of Manchester which is "interested in evaluating the extent to which their programmes are successful in meeting organizational needs."(Mehmood et al, 2008).

The organizations needs are the "raising the profile of project management, career development, promoting a cadre of project management, specific interest groups and increasing the project management knowledge of employees. These factors have created an increase in the application of ROI in project organizations."(Mehmood et al, 2008)

Many different methods are in use in many universities in order to have the best result in the education of project managers.

The universities are concerned about the technical skills and about the human skills too that a manager should have.

Ira Pant and Bassam Baroudi emphasize that:

The required 'hard (technical) skills' at the expense of the 'soft (human) skills'. Subsequent discussion will highlight the need for a balance between hard and soft skills within project management education in universities. It will conclude that educators within this discipline should recognize the importance of incorporating greater human skills aspects into their educational programs. (Pant and Bassam, 2008)

Approaches are also taking place in order to change the project management education and to follow new procedures and tools in order to prepare the project managers to become the best in order to know "what has happened on their projects and how this will affect every aspect of what they are trying to achieve. Numerical reports, analysis and application of standard project management techniques alone will not provide this information." (Hartman, 2008)

Studies have been made in order to find "the traits that distinguish the best project managers from the rest and then to

identify the intuitive mind skills that are required to develop and master these traits."(Hartman, 2008)

So after all these researches better educational methods are being proposed that will change and will prepare more properly the project managers to deal with the problems of a project and also will help them to develop the team work and the team building which are also very important skills despite of the fact that during the education more attention is being paid to the technical skills of the project manager.

So project management education is very widespread but it concerns the project managers that they have studied in a university and they have educated later about the project management.

A great effort is being done in order to provide the future project managers with the most important and useful knowledge and to prepare them to deal effectively problems and to manage better their project. It could be considered that the education of the future project manage is not the only the solution for the success of the project but the education of all the employees that are involved to the project and outsources of a project.

3.4 The Construction Industry and the construction project

Gould points out that the Construction Industry is an industry without specific boundaries because the companies, organizations and public agencies who are participating in project can be many.

Gould points out that:

Construction is also more a service industry than a manufacturing or product-based industry. Even though large products are constructed a project's success is more dependent on the people involved than on a particular piece of equipment, a process or a patent. "(Gould, 2004, p.8)

Of course the construction industry is constituted from big enterprises and from small companies who are established by persons who have technical skills and targets.

The projects that undertake the construction companies are divided to the following categories:

"Residential projects

Building construction projects

Heavy construction projects

Industrial projects"(Gould, 2004, p.19)

As Gould points out the construction of an individual home and the apartments are assumed as residential projects.

These projects are not requiring a high technology and they do not cost a lot to undertake such a project. Of course this has caused the increased of the small companies. "When the economy is strong, these companies do well, but when times are tough, many of these companies go out of business"(Gould, 2004, p.20).

The building construction projects include "office buildings, large apartment's buildings, shopping malls, theaters. Most of these projects are privately funded, though some projects like schools, courthouses and city offices are publicly funded."(Gould, 2004, p.20-21)

Heavy Construction projects include:

The roadways the bridges, dams and tunnels. These projects are publicly and funded and therefore are sensitive to governmental policy. These projects tend to be long in duration and thereby less sensitive to the ups and downs of the economy and they involve the heavy use of the equipment. (Gould, 2004, p.21-22)

"Steel mills, petroleum, refineries, chemical processing plants, and automobile production facilities all serve as examples of industrial projects "(Gould, 2004, p.23). The most important issue in these projects is the quality and the time because "they are the most technical projects; only a few designers and builders are qualified to bid on any type of

facility. Since the process technology is critical, the designers and the builders need to work together throughout the project."(Gould, 2004, p.24)

3.5 Project management in construction projects

In construction projects project managers are usually civil engineers that they do not interfere with the technical parts of the project or outsider project managers who are undertaken the projects and the project team of a construction project is constituted from the civil engineers, the architects, the technicians.

Dave Lash mentions in Gould that the teamwork is still the biggest promise in the success of the industry projects and a manager is the person who, in order to forge team and to gain a project, will have to use a lot of techniques and to work hard in order to succeed it and it is not always certain.

Of course the stronger teams are those that they collaborate for years and they are devoted to the scope of the project.

In a construction project team members are people who sometimes are representing different companies and they will collaborate for a short term in order to implement the project and then the team will be broken off and a new team in a new project will be created.

The parts of the team are the technicians, the engineers the managers. A team should have the same basic knowledge in order to be able to communicate, so the team members have definitely the same basic technical knowledge, although it would be better to share and the same basic project management knowledge.

Of course the technicians that exist in a construction project do not know the methodology of project manager or some fundamental ideas and these can cause a lot of problems and insufficient projects.

According to Feld and Charper "the causes of failures in constructed facilities are classified in seven categories:

1. Fundamental errors in Concept
2. Site selection and site development errors
3. Programming deficiencies
4. Design errors
5. Construction errors
6. Material deficiencies
7. Operational errors"

(Feld and Charper, 1997, p.14)

Some of them causes are due to the misunderstanding between the project manager and the technicians or they can be caused due to the ignorance of the technicians of the project management.

Many construction errors have been made due to the lack of communication that exists between the members of the project team such as the technicians and the managers. The right information for the project were not distributed to the right persons or at the right time so the construction project failed, and the performance reports that should be completed in a construction project in order to know the progress that is being made and the quality of the performance were not completed properly so they had insufficient information.

Also the communication problems are very important and can cause construction delays especially for the case of a construction project which will be implemented by employees and technicians who are belonging to different nations and this is a very usual phenomenon in such projects.

According to Toor and Ogunlana in a construction project in Thailand, great delays have been noticed so interviews and questionnaire surveys took place in order to find out the cause. The most significant causes of the delays were "lack of resources, poor contractor management, and shortage of labor, design delays, planning and scheduling deficiencies, changed orders and contractors' financial difficulties" (Toor and Ogunlana, 2008).

But except them the multicultural and the multilingual environment that existed to the project caused many problems to

the communication part of the project and this brought a lot of delays.

Of course with the great development of the technology, communication is easier and more feasible, with the use of fax, emails, than it was before. But all these means can facilitate the communication between the team members but they do not build the team. Teams can be built if they share the same vision, and it is also very important to confront facts and problems with the same ideology.

As Goodrum, Smith, Slaughter and Kari point out that many technical problems appeared to many projects and they have caused the increase of the indirect and the direct cost, that had been caused due to the misunderstandings between the utility company and the contractor and due to the ignorance of the impact of these problems to the cost of the project.

Goodrum et al are describing some technical problems that have been caused to technical projects:

In the US 27 Pitman Greek Bridge Project the following problem had been occurred:

Two utility vaults were constructed as part of the project's new waterline. After the installation a fire occurred in the nearby community causing water to flood the vault. The water that filled the vault was unable to drain because a drain was never installed in the vault due to a

design oversight. The contractor agreed to replace the faulty valve at the cost of \$34,450, but they did not agree as a result utility maintenance crew continue to periodically pump water out of the vault and the cost of it was \$107,784. (Goodrum, Smith, Slaughter, Kari, 2008)

If technicians knew the impact that a flood would cause to the cost of the project they would have had informed for the design oversight.

In the Bryan Station Road project damage to the telephone lines happened and the direct cost of the gas line repair was \$61,000. One damage happened because the utility company assured the contractor that there was enough clearance between the trench and the telephone line of course that was not right and the damage to telephone line was caused.

The technicians of the utility company should be aware that the data that they are providing the contractor should be accurate because it has a great impact to the project.

In Richmond Road Project damage to fiber optic phone lines caused an increase to the cost of the project. The damage to the fiber optic phone lines was caused by the contractor because he hit the accidentally although he knew their exact location.

3.6 Conclusions

Project management education is developing and new methods are adopted in order to improve and to make the education of the project managers more sufficient.

Of course education plays a very significant role to the creation of a success project manager but it is not panacea that will not solve their problems that will be appeared to their future projects.

As Pinto refers that project managers should have a lot of skills, like "communication, organizing skills, technological skills, leadership skills, team building skills and coping skills." (Pinto, 2008, p.13).

Communication and team building skills can not be taught effectively, project managers will inquire some basic knowledge from the project management programs about them that but they will improve these skills through their experience.

Teams in a project should share of course the same vision and they should have the same goals in order to implement the project. Many of the team members are participating to the definition of the scope and to the definition of the vision of the projects and some others employees who are just the resources are just informed for the final decisions that had been taken and they are taking the work that has been assigned to them.

In a construction industry the resources that are not participating to the plan of the project and they are just executing the schedule of their activities are usually the technicians.

They are part of the team and they communicate with the engineers and usually through them with the project managers of the project. These teams are very difficult to have strong bounds and the teamwork sometimes is not effective. One very important issue to bind a team especially for a short time is to be sure that everyone is "speaking the same language". The common language between the technicians, the engineers and the managers is the technical language but this facilitates the collaboration between the engineers and the technicians in order to be facilitated the collaboration between the managers and the technicians, technicians should also acquire the basic project management knowledge.

Many technical problems and dysfunctions, as it was mentioned before from the above case studies, that are being created through the implementation of the project and they have a great impact to the scope, the time schedule, the cost, the quality, the communication of the projects which are the project management knowledge areas according to the PMBOK, would have been avoided or they would have a smaller impact to the project if the technicians were informed too about those knowledge areas.

4.0 Methodologies and procedure

4.1 Introduction

As it was shown from the literature review the project management education is very important and it is still developing in order to create future project managers that they will have the necessary skills and they will be able to confront problems that can ruin a project.

In many projects project managers are alone to this effort because most of the resources do not know the project management knowledge areas so they ignore the consequences of their actions, negative or positive, to the project.

This appears a lot to the construction projects because they have a small duration comparative to other projects that lasts many years and teams should be built quickly and then they have to be dissolved fast and new teams to be built.

So except from the education of the project managers, which is very useful, another help to project managers work and to the whole project would be to have informed and educated resources around the area of project management.

4.2 Education of the resources

An approach to create educated resources in a company would be to include to their education program and the course project management where they will learn some basic knowledge about it and they will show the expected professionalism to the project.

Particularly the resources in a construction company who are the technicians, the foreman, employees who are completing the quality reports or even the subcontractor should be educated about the project management so failures and delays will be minimizing and it will make easier the job of the project managers.

An educational plan will be developed that has the scope to inform the future technicians about the project management in order to be able to communicate and to facilitate the project managers' work.

4.3 Research

This research will be a Development research because an educational program will be developed but it will be also an Evaluation research because after the education of the resources the progress of the implementation of the projects will be measured and the value of this educational project will be defined.

5.0 Results

5.1 The problems that have been caused due to the ignorance of the project management

The teams that are implementing the project are the resources of the project but the most of the time they themselves ignore it.

The technicians of a project do not know the definition of project management and of course they do not know about the world facts that have led to its development. They ignore the world changes.

Of course many times they do not know who the project manager is and what are his duties and they are giving report to the inappropriate persons so important information never reach project manager office, or they do not provide with the necessary information at all.

Technicians are usually the resources in a project and they have certain activities to be done in a certain time with a certain technique which the most of the times is determined by the company. Many times they do not pay attention to the orders of the superiors, or they do not follow the time schedule. They cannot understand the problems that can be caused to the project.

Some of the students will become subcontractor and they will be committed to implement works in big projects, sometimes they are not following the program or the specifications that

have been given, so they cause delay to the project and they can eliminate the quality of the project due to their careless work, or due to their rush to be on time.

Of course sometimes technicians do not understand why they have to work overtime or why they do not have work in a company and of course they do not pay attention to the schedule of the project, because they believe that everything are flexible and changeable, so project managers are pushing the project teams to proceed in their tasks but they find these obstacles from the technicians. They do not know that a project plan exists and that it should be followed.

The subcontractors find enough problems during their work such as: misunderstandings about the expectations of the customer, delays, the final cost is different from the initial and the customer has not been informed, incapability to control their project. All these problems are the result from bad or lack of planning.

Some of the construction projects are quite big so many construction companies and sometimes multinational companies and public agencies have to participate to the implementation of them, so resources from all the companies have to collaborate and to become a team.

Most of the times the technicians do not understand the necessity of developing a team and they are working without

communicating with the technicians from the other companies so problems and conflicts can appear and most of the times have a serious impact to the project.

The students, who will become subcontractors, have a wrong idea about the cost and the quality. They believe that quality is increasing the cost and the customer will not prefer them because of that. So in many of their works they are delivering a work with low quality and a satisfying cost for the customer. They do not order to their suppliers' on the right time and as a result they have delays to their work.

Some of the students will become foreman in a project and they should delegate all the resources to their project rightful. They know very well the technical part of the project but they find difficulties in forecasting the appropriate resources for a task and they provide project managers with wrong information, so many times appears to be a task overloading from resources or not to have the necessary one.

Some of the students will become the supplier of materials or even services in big projects. They do not have the sense of the importance of delivering the materials or the services in exact time. That have caused many times an impact to the scope of the project and many projects have failed because of this.

5.2 Development project

In these educational institutes each department is a two years courses and each year has two semesters. Each semester is lasting 10 weeks of lesson and two weeks of practical exercise and then the students are taking exams for each one lesson of the semester.

So the development project of this study is going to be the creation of the plan of the lessons that should be taught in 10 weeks to the technicians and they should acquire the basic knowledge about project management that will be useful to their future job.

The scope from these lessons is not to create future project managers; it is to sensitize more people that are involved in projects about project management and to understand the utility of it and to acquire the students a sense of the thought that will be necessary to create a successful project.

5.3 Plan of the lessons

In each tutorial week the issues that are going to be described are the scope of the particular instructive unit and the future utility that it will have to the students in their work, and the theme of the each lesson and the instructive units if it is necessary.

First week

Theme: The project management and the project manager.

Units:

- Definition of project management
- Needs that led to the creation of project management
- Definition of the project manager

Scope:

The scope of this lesson is to define the terms of project management and project manager to the students.

It should be clear that the needs that helped to the evolution of project management are: "the exponential expansion of human knowledge, the growing demand for a broad range of complex, sophisticated, customized goods and services and the evolution of competitive markets for the for the production and consumption of good and services"(Meredith, 2008, p.1).

Also this will help to make them understand the changes that have happened world-wide, it will widen their thought and this will challenge to take seriously this course, although that it is not a technical course.

They should be able to recognize the project manager in a project and to understand that project manager is the man who is accomplishing the project and he is responsible for all the elements that are involved in the project during all its life cycle.

Second week

Theme: Project

Units:

- Scope
- Performance
- Time
- Cost

Scope:

Students should learn the definition of project and the fact that project is not only a technical issue and it has other important elements that are defining it.

It should be clear that each project is unique and it has certain elements whether it is in construction or not, such as cost, time, performance, and the scope.

Students should understand the relation between these three elements and how a change to one of them can influence the other and can provoke undesirable or desirable consequences to the project. So they will learn the delicate relation and they will become more responsible to their work.

Third week

Theme: Construction projects and construction industries.

Units:

- Boundaries of the construction industries
- The future of the construction industries
- Characteristics of a construction project

Scope:

Students are not aware of the limits that a construction industry has and the organizations that are involved, so they will learn who can be involved in construction project. The persons that can be involved in a construction project can be the state, the local agencies, the citizens, business, engineers, construction companies, consultants.

It should be mentioned as Gould writes that "construction industry is also more a service industry than a manufacturing or a product based industry" (Gould, 2004, p.8) because the project's success is connected with the skills and the communication between the people.

These will help them to realize that the resources from the other companies are not competitor but that they all are working for the same purpose.

They should be taught about the characteristics that a construction project has such as: the target, defined activities, a start and an end, the deliverables, and the necessary resources. So they will understand that the goal is not only to construct something but to build something with certain specifications. This will be particular useful for the subcontractors because they undertake small projects in big projects and it will help them to manage better their work and

they will become more consistent and this will facilitate the work of the project managers in a big project.

Fourth week

Theme: Team

Units:

- Definition of a team
- Benefits of a team

Scope:

Students should understand that they will be part of a team and not of a group of people because a "project team may be defined as a number of people who are working closely together to achieve shared common goals."(Burke, p.301)

Project's success is depending a lot to the teamwork of technicians. They should understand that most of the projects have failed because of lack of collaboration. Technicians in a construction company will be members of different teams in each project. So they should understand that they should collaborate with the rest members of the team.

Fifth week

Theme: Communication

Units:

- Importance of communication
- Conflicts

Scope:

Future technicians should be informed for the importance of communication and to be encouraged to communicate with the team members and with the superior of them in order to provide them with the necessary information that will help the project manager to control the progress of the project and to achieve their goals.

Also conflicts are very usual to a team. Most of the times the team members do not know how to manage them and they are destructive for the team. Through this lesson they will know how to manage them, so delays and undesirable impacts will not happen to the project or they will be managed quickly and effectively.

Sixth week

Theme: Quality

Units:

- Process of quality
- Importance of quality

Scope:

In this lesson it will be mentioned about "the quality planning, the quality assurance and perform of quality control."(PMBOK, p.179) Students should be familiar with these processes because they are determining the quality standards and they are ensuring to meet these standards the project and they also provide control of quality.

They will learn about the quality documents that they have to complete in each project and the utility and importance that they have in any project. So the project managers will take the right information about the quality of the project and they will be able to control well the quality of the project.

Also in this lesson it will be clarified that "the key to lower operating costs is higher quality, doing things right first time every time" (Payne, p.27), so especially the future subcontractors will understand that quality is more important to their work and the improvement of it will only benefit them.

Seventh week

Theme: Cost

Units:

- Estimation of cost
- Control of cost

Scope:

Basic knowledge about the cost estimation should be referred in order to understand the ways to estimate the cost especially the future subcontractors, because they will undertake small projects and they will have to make an offer for their work.

Subcontractors should be able to estimate right their budget otherwise they will damage their financial part of their work or they will have to renegotiate and this can damage them

also because they can lose collaboration with a construction company because change of the cost of some workpackages that would be executed from them will impact the total cost of the project, so project manager might be forced to deny collaboration and to find another subcontractor which will have also an impact to the time schedule of the whole project.

Eighth week

Theme: Customer satisfaction

Scope:

Many of the technicians ignore the customer satisfaction even if they are subcontractors, even if they are individual technicians.

It should be clarified that they should always listen and communicate with the customer in order to be sure about his demands and to inform him about the progress or the changes that should be done.

So in case that they will be implementing a small project in a huge project they will always communicate with the project manager of the main project, who in this case is going to be the customer, and he will be aware of the changes, the progress that is being made so they will have a better collaboration and a more satisfied customer.

Even if they will be undertaking individual works they will become better professionals if they listen to the customer and meet his expectations.

Ninth week

Theme: Resources

Units:

- Estimation of the resources
- Delegation of resources
- Multi-project companies and resources

Scope:

This lesson will provide guide the students about the estimation of the resources and that it is "linked directly to the scope of work and the bill of the materials" (Burke, p.180). So the future foremen will be able to estimate the resources that they will need for a task and to check if the resource plan will be compatible with their estimation. Of course this will help project managers since they will have an extra help for the forecast of the resources.

Also the subcontractors will be able to estimate the accurate number of the technicians that they are going to need to implement certain tasks. This will help them to build a stronger team and to reduce expenses.

Students should also be informed about the cases that resources should be overloaded and the cases that resources should be smoothing.

They will also take an idea of the multi project companies and how they schedule the delegation of the resources, so they will later understand the reason of changing place of work and project.

Tenth week

Theme: Suppliers

Scope:

The scope of this lesson is to discuss about the procurement phase and the problems that can be provoked from the suppliers. Students that will need suppliers should know that the completion of their project can be determined by them. So they will learn to be more specific about the products or the services that they want to buy and more specific to the contract or the arrangement of the order.

On the other hand this lesson will be particular useful for the student that they are going to be the suppliers. They will become more responsible and accurate to the orders, so the delays to the projects due to the suppliers will be reduced.

6.0 Discussion- Conclusions - Recommendation

6.1 Discussion

The lack of knowledge of project management to the resources of a project can bring a lot of difficulties and delays that cannot always be prevented from the project manager and his team.

Problems such as lack of communication between the teams of a project, poor quality, and schedule problems can lead the project to failure, so some of them can be dissolved with the education of the resources about the values and the theories around project management.

In a company the technical part of a project is known to all the levels of the company, the same would be happening and for the managerial part of the company. Generally the most important and basic information and knowledge will be circulated to all the levels of hierarchy in a company.

With this method the failures in projects will be less and project managers will have less stress and less worries about some issues of the project.

If the results of this research are going to be optimistic; a new educational area will be introduced to the educational institutes.

The education of the technicians will include and elements from the project management area so it is going to be a more updated and it will be in step with the times.

The small firms that will be created from these students and they will provide services to the big companies will be well-organized and they will be more stable to the market than they were before.

Market will be more satisfied from the attribution of their labor force that will have attended to these course, so they will encourage our program and a widespread of the term project management will happen, so more people will be aware of it and it will become an essential part of each organization, which is very rare at this time in Greece.

6.2 Future prospect

The project management can be added as a course to an educational institute but it would be also thoughtful to organize seminars that would service students who are already working or they had studied to the educational institute and that course was not included to the course program that they had followed or even construction companies who are desiring to educate their resources and to inform them about project manager.

So the educational program that it was before created is divided to ten units in case that the course will last ten weeks.

In the case that the course program has to be shortened to four weeks and to become a seminar it will have to be changed to:

Course Schedule Four Weeks	
Weeks	Topics
First week	<ul style="list-style-type: none"> • Project management • Project manager • Project • Construction projects and construction industries.
Second week	<ul style="list-style-type: none"> • Team • Communication
Third week	<ul style="list-style-type: none"> • Quality • Cost • Resources
Fourth week	<ul style="list-style-type: none"> • Customer satisfaction • Suppliers

6.3 Evaluation project

At this part of the research the evaluation of the project is not possible, but it will be done after the application of the above education program.

After the termination of the courses, the students that will have attended to these lessons will start working either to a construction company, either as subcontractors, and either as retailer of building materials.

So after a time period a research will start to the old students and to the project managers of the companies that some of them will be working to or they will be collaborating as a subcontractor or as retailers.

The research will be questionnaire that should be filled in order to find out if these educational programs have facilitate the project managers and if they have added quality to the projects.

Also it will be conducted to find out if the work of the subcontractors or the suppliers have been improved and if these courses have also facilitate them.

If the results of these researches will be optimistic then we will continue the educational programs and we will improve them.

6.4 Widespread of the project management education

Of course in this research the educational program which is proposed is concerned only the students who are going to work to a construction company or the students who are going to work to a technical projects as technicians, as employees, quality controllers, foremen, subcontractor, suppliers, decorator.

An educational institute is dealing with the education of students and to other sections, such as graphic designers, sound engineers, car engineers, physiotherapist etc. In each field courses of project management could be organized according to the already developed education program and adjusted to the need of each field.

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Questionnaire A

Refer to project managers.

1. Do the resources follow the time schedule that has been given to them??
2. Does the important information from the resources reach to the project team more easily?
3. Do the resources inform the superiors about the problems that appear or that they will appear timely in order to find better and quicker the solution and to prevent the delays??
4. Are the subcontractors that have attended to the project management lessons more accurate and more responsible to their work than they used to be??
5. Has the quality of your project been improved??
6. Have the quality reports improved and do they have the useful information?
7. Have all the reports improved and do they have useful information?
8. Has the teamwork improved?
9. Are the conflicts between the resources solved easier and without causing problems to the project?
10. Are the material suppliers that have attended to these lessons more careful to the time schedule of the project?

11. Have you noticed a difference to the project execution that has facilitate your work??
12. If change to the way of project implementation has been appeared do you believe that is due to the project management lessons?
13. What area of the project management should be emphasized and why?
14. What else do you believe can facilitate your work?

Questionnaire B

Refer to the students who are subcontractors or material suppliers.

1. Has your professional collaborations improved?
2. Is it easier for you to estimate the time and the cost and the essential resources for each task you are assigned to?
3. Are the offers that you are giving to each company more specific?
4. Has the collaboration between you and your workers been improved?
5. Have you created a good team?
6. Is the resolution of the conflicts easier?
7. Has the quality of your work been improved?
8. Are your clients more pleased from the service that you are providing to them?
9. Are you more careful to the order of the materials and to the delivery of the materials?
10. Except the technical lessons do you believe that the project management is essential for these educational courses?
11. What else do you believe that should be useful to be taught around management?