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PROJECT MANAGERS' RESPONSIBILITIES IN MULTIDISCIPLINARY COLLABORATION PROJECTS: A CASE STUDY IN EDUCATION

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The success of a project is not only built upon the performance of the team involved but also on the contribution of the project manager and the other participants such as the client, stakeholders, consultant, suppliers, and authorizing bodies. In particular, the project managers' contribution in coordinating and leading the participants is fundamental to the project success. The research hypothesis addressed in this paper is to investigate how a multidisciplinary collaboration experience between two departments, using a Work-Based Learning (WBL) method, can improve students' training while handling responsibilities in project management. This paper presents a practical approach to the teaching of Project Management, based on multidisciplinary collaboration protocol developed by the College of Engineering at Qatar University. Collaboration between two Project Management courses was repeated for two years, involving students of both disciplines in a joint assignment (a collaborative project). During the experience, the project managers' responsibilities were analyzed and evaluated by the students. Outcomes of the study show that because there is a close correspondence between project manager's skills, interpersonal action, and readiness to take responsibility, the success of a project is strongly influenced by the capabilities of its leader. The paper meditates on the contribution of the multidisciplinary experience in developing students' capabilities and responsibilities when working on a collaborative project, improving entrepreneurship's performance and building new ways of collaboration in higher education.

Keywords: Leadership, Practice experience, Entrepreneurship, Practical approach, Teamwork.

1 INTRODUCTION

This paper describes a practical approach for assessing the responsibilities of the project managers during a multidisciplinary collaboration experience that was applied in the Department of Architecture and Urban Planning (AUP) and the Department of Industrial and Systems Engineering (ISE) at the College of Engineering at Qatar University. The project brought together students from the Construction and Project Management course (ARCT 530, AUP) and the Project Engineering course (IENG 481, ISE), mixing them into working groups (Mazzetto 2016a).

The fundamental aspect of the multidisciplinary approach was the organization and management of a shared project, and the primary intention was to simulate a real project and enable the students to understand the dynamics of group work and experiment with leadership techniques by applying the theoretical knowledge they learned on the course.

A first multidisciplinary collaboration project started in the Fall 2015 semester and was repeated in the following Fall 2016 semester, with a total of 183 students, divided into 28 multidisciplinary groups.

The primary research objective was to simulate a real-life scenario that helped students to address the roles and problems usually arising in professional projects, such as the need for collaboration and leadership responsibilities in multidisciplinary teams.

2 LITERATURE REVIEW

In the literature, it is well known that it is crucial to understand the importance of the project manager in the achievement of construction projects (Cleland 1995, Duncan 1993, Chileshe and Ali 2009), due to the fact that the manager's duties and responsibilities have an immediate impact on the completion of such projects. Usually, the project manager is one of the critical people that lead and guide projects in the right direction and has three clearly defined managerial responsibilities (Lientz and Rea 2001, Kerzner 1998) such as resource manager, control manager, and coordinator. Additionally, the project manager is responsible for providing the achievement of group and organizational objectives and targets.

In compliance with the European Commission contributions to reinforce Work-Based Learning (WBL) elements in Vocational Education and Training (VET) (European Union EU's Charter of Fundamental Rights 2000), there are many WBL models have been developed in Europe to enhance the students practical experience and integrating into a school-based program. The Work-Based Learning approach, used in the present research, provides students with "real-work" experiences in which they can apply their knowledge and expertise to enhance their employability.

The WBL approach of the proposed multidisciplinary collaboration was integrated in the Qatar University-based program and the aim was to create "real project" work environments, establish contacts and cooperation with real clients, develop students' entrepreneurship competencies and skills while working in multidisciplinary teams (Mazzetto 2016b, Mazzetto 2017) and focusing on work-process orientation, innovation, and creation process.

3 MULTIDISCIPLINARY COLLABORATION METHODOLOGY

In particular, the present paper focuses on the collaborative WBL model adopted by the Department of Architecture and Urban Planning (AUP) and the Department of Industrial and Systems Engineering (ISE). The collaborative WBL model used and developed during the multidisciplinary experience enabled the individual learners to work in collaboration both with other learners and with the tutors (instructors), coordinating, developing and adapting their projects with the needs of private organizations and governmental institutions.

With this model, through a formal protocol, the College of Engineering effectively involves the students from different disciplines to focus on multidisciplinary activity through a joint assignment, guided by the instructors. The groups are requested to work as part of a collaborative team. The results are the collaborative design and delivery which carry academic credits.

The collaborative model's primary aim is to build up a discussion between the students' learning experiences in the multidisciplinary collaboration project and to develop the competence of meditative practice. The collected data and observations enabled the implementation of the tailor-made WBK model.

The advantage of the adopted approach of WBL is that it permits students to get an empirical assessment of the project management responsibilities in the workplace, during the coordinated multidisciplinary classes and thereby meeting the standard requirements.

In the end, the contributions of individual students concerning responsibility, either as members of groups or as project managers, were described in a final activity report in which the progress of the work was shared, to facilitate the development of multidisciplinary interaction and permit assessment by tutors.

3.1 Data Collection and Final Reports: Tools for Leadership Assessment

The collected data were divided into sections as part of the final report requirements: (1) general data about the students and the projects carried out within the groups (2) an interaction diagram for evaluating the interpersonal activities of the project managers (3) a responsibility matrix for evaluating the responsibilities of the project managers.

The multidisciplinary projects enabled a significant amount of other data to be collected relating to project management techniques and tools, and the collaboration between the participants in the groups. The results presented here are only related to evaluating the participant responsibilities while working into multidisciplinary university collaboration.

3.2 Collaborative Interaction Diagram

The data presented by the students in the final reports showed the degree of interaction between the participants in the multidisciplinary collaborative exercise, and the value of the project managers- responsibilities, by creating a collaborative interaction diagram.

The students evaluated the interaction between the participants by establishing which values and roles had been most involved. The data in Figure 1 shows the averages of the results obtained across the two years of the multidisciplinary collaboration exercise divided into high, medium, and low levels of participant interaction.

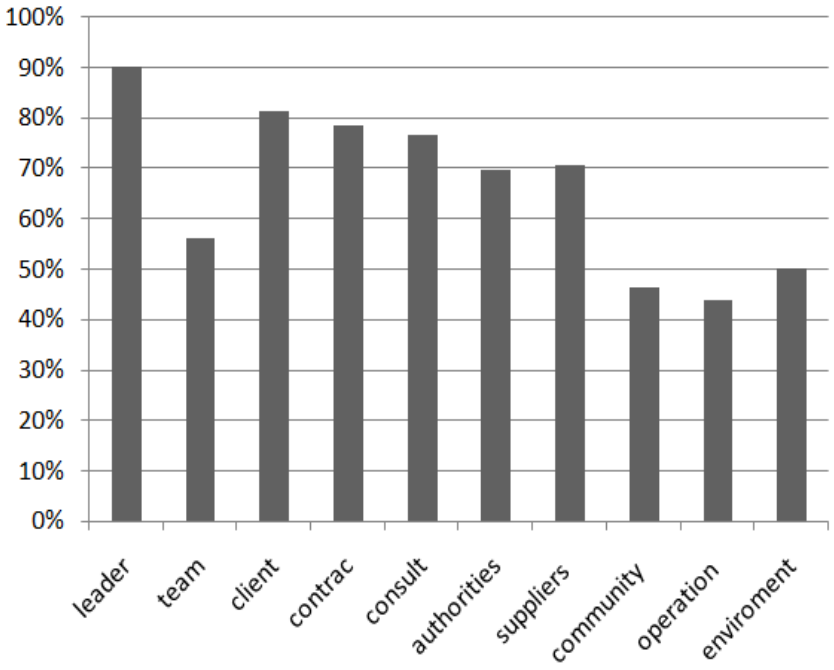

Figure 1. Multidisciplinary collaboration' interaction diagram, average scores (Fall 2015 and Fall 2016). Source: Author.

The highest levels of evaluation for interaction were assigned to the project manager being the most important key person in the multidisciplinary collaborative exercise. However, given the low evaluation results obtained, we deduce that the level of interaction within the multidisciplinary team and the operating team could have been better if greater involvement and collaboration between the members had been encouraged during the various project development stages.

3.3 Project Managers' Responsibility Matrix

The data presented in the third section of the final reports showed the assessed level of responsibility of the project manager, using a responsibility matrix. These responsibilities were divided into the four phases of the project lifecycle: (1) Planning (2) Design (3) Execution (4) Completion.

Table 1 gives the average values obtained for the assessments, across both semesters (Fall 2015 and Fall 2016) of the collaborative projects, showing the values of each member contribution for achieving the project's completion. It is noteworthy from the reached values that the highest level of responsibility was assigned to the project manager, particularly at the initial "project development" stage, followed by the "time scheduling" whereas the project manager's responsibility was scored as low concerning the "purchase orders" responsibility. In fact, such responsibility was usually carried out by independent group of students in the multidisciplinary teams.

Thanks to these evaluations made by the students, the managers' responsibility matrix shows that during the multidisciplinary collaboration, the most responsible phase for the project managers was during the initial phase of the project. Although some of the activities in Table 1 are not the direct responsibility of the project manager, they are usually indirectly influenced by the leaders' skills and responsible approach.

Table 1. Project Managers' responsibility matrix, average values (R= responsibility role, S=Supportive role, I=informative role) (Fall 2015 and Fall 2016). Source: Author.

	PLANNING (%)			DESIGN (%)				EXECUTION (%)						COMPLETION (%)		
	Develop Project	Establish Budget	Time schedule	Project Responsibility	Develop Design	Perform Project	Coordinate Integration	Review Submittal	Develop Checklist	Purchase Orders	Perform Quality	Progress Reports	Hold Meetings	Supervise Corrections	Address Concerns	Final Report
R	84	57	64	48	55	11	14	16	4	0	43	5	21	9	2	13
S	0	11	0	23	39	23	54	23	43	64	9	20	16	55	45	27
I	16	32	36	29	5	66	43	61	54	36	48	75	63	36	54	61

4 RESULTS

Following completion of the multidisciplinary projects, the project manager responsibilities were assessed and compared with the project outcomes showing a high level of correspondence. It can be seen that a low percentage score for the responsibility of project managers corresponds to a similarly low percentage score for the project outcomes, in the same way in which a medium/high percentage score for the responsibility corresponds to a similarly medium/high percentage score for the projects.

To enable assessment of the ability of the project managers, most of the projects required them to take a high level of responsibility during the initial phase of project development, team selection, subdivision, and assignment coordination, followed by overseeing the project planning, risk assessment, budget management, and the quality control of the project, particularly during the completion phase. From these experiences of multidisciplinary collaboration, it emerges that the outcomes of a project are very often directly affected by the manager's responsibilities, both concerning project quality and the completeness of the results obtained.

5 CONCLUSIONS

The research presented in this paper considers the competencies, interactions, responsibilities, and leadership experience that were evaluated as the most important regarding their contribution to the success of many multidisciplinary collaborative projects carried out in the academic experience.

The roles of the different participants in a project are often difficult to control, but the ability and responsibility of the leader, is precisely to know how to create a fair balance between the parties involved, and an adequate level of communication and collaboration.

So far as the possible implications for academic research are concerned, the characteristics highlighted here as the most important for correct responsibility by project managers could be included in specific degree programs, to construct the basics of a reliable method for teaching the project managers of the future.

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