

# **THEORY AND PRACTICE IN PROJECT MANAGEMENT: A MULTIDISCIPLINARY APPROACH**

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This paper introduces an approach currently being implemented in the Department of Architecture and Urban Planning at College of Engineering in Qatar University. It describes the primary components of the theoretical research including the course program in Construction and Project Management, its integration with other courses, the cooperation required to support the interdisciplinary emphasis, and the establishment of an innovative academic/industry partnership to provide a state-of-the-art physical and technological infrastructure to support the program goals. The justification and benefits of the step from implicit to explicit theory are discussed based on the influential work of recent studies and the developments of the research approach of the multidisciplinary collaborative project. It is contended that much, although surely not all, of the present implicit theory, can already be pinpointed, and the associated with counter-productive impacts, explained and empirically recognized. Despite the fact that previous studies on interaction between theory and practice offered various degrees of value to the research field, some limitations and debates remain awaiting further investigation, as do the significant changes associated with the construction industry and project management. The research concludes that the efficiency of interaction between theory and practice in the construction industry needs to be further examined, and a possible research method is also proposed for carrying out future studies.

*Keywords:* Collaboration, Partnership Awareness, Road safety.

## **1 INTRODUCTION**

### **1.1 Project Management and a Multidisciplinary Research Approach**

Projects often comprise of people and organizations from different nationalities and disciplines such as architects, engineers, clients, contractors, suppliers, and banks which generates complexity in the managerial procedures, due to different multidisciplinary approaches inside multicultural teams, foreign managers, and international partners. In the literature it is easy to see that different disciplines can influence a variety of project management issues such as: teams (Binder 2007) leadership (De Bony 2010), communication, performance (Laufer and Tucker 1987), risk assessment (Zwikael and Ahn 2011), business negotiations (Hurn 2007), international project management (Lane *et al.* 2005) and planning. In Qatar there are many complex projects performed in collaboration with foreign companies and local

partners such as Doha Metro, Lusail City, Hamad International Airport, Education City and many others. Project management is important to the success of these initiatives, and project managers face numerous challenges, which include multi-disciplinary factors such as managing mixed teams pertaining to different disciplines and additionally many cultural differences within the same team. Specifically, how does the multidisciplinary approach influence project managers' perceptions and utilization of managerial tools? Professionalism starts at the first steps of a student's education in university. Different disciplines, from their initial stages of training, can model and affect the student's attitude and behavior in collaborative work, and the way they act and perform as the new Professional Managers (PMs) of the future. In Qatar University, for example, a multidisciplinary research project has been proposed and developed to involve students and instructors specializing in diverse disciplines and aspects of Architecture and Urban Planning (AUP) and Industrial and Systems Engineering (ISE). The aim is to get them to focus on a common assignment as part of their courses (a class project in this case), using the tools of project management to investigate and develop the students' capabilities and attitudes when working in a multidisciplinary project. The extent that project managers and their teams interact effectively within the project environment is not exclusively an issue of multi-disciplinarily; it is influenced by different national cultures, and past experiences, and can affect a variety of managerial roles and activities, for instance, leadership schemas (the criteria of a good or a bad leader) and behavior scripts (greetings) vary between those of different cultural backgrounds.

## **2 A MULTIDISCIPLINARY PROJECT**

### **2.1 Multidisciplinary Project Objectives**

The multidisciplinary research project was developed at Qatar University, involving a total number of 76 students both from Architecture and Urban Planning (DAUP course ARCT 530 Construction and Project Management) and Industrial and Systems Engineering (ISE course IENG 481 Project Engineering) for the fall of 2015. The project topic was linked to the active competition of the Qatar Road Safety Studies Center (QRSSC), which is a prominent research center in Qatar University, in the form of prize money to be provided to the winning team. The multidisciplinary research project title is "Project Management tools and techniques for the development of a multidisciplinary project on Road Safety in Qatar". The two batches of students derived from various disciplines were requested to use the tools and techniques of PM, through different disciplinary approaches, for the development of the project deliverables, working in groups and demonstrating their collaboration. The aim of the project was to increase road safety awareness in Qatar. As the youth are the basis of the Qatari society, the competition target the youth of Qatar University to engage them in road safety awareness and its importance.

### **2.2 Project Goal, Deliverables and Proposals**

In the last few years, the number of people who have started to drive, of both genders, has increased in Qatar and this has led to an increase in traffic jams and in the number of accidents (Qatar National Road Safety Strategy NRSS 2013-2022). Many factors

can contribute to the occurrence of accidents such as lack of road safety awareness, irresponsible and misbehaving drivers and other issues related to the design of the road. The students started their project with collaborative research to monitor the current status of road safety awareness in Qatar and about how road safety in Qatar is a major issue.

The students were working towards producing the project deliverables requested, including reviewed pedestrian safety and road regulations. In addition, their work aims to propose a re-design of some dangerous areas, improving the quality of the road layout in Qatar in order to meet the required road safety measures. It is highly important to design in accordance with the local codes and regulations. However, when it comes to road safety, several additions needs to be considered to ensure safety and that take into account the variations of behavior that one observes while just taking a stroll along the road. For example, pedestrians' safety is quite an issue, since many families visit pedestrian areas with their children, who are at a very high risk of getting into an accident because of the fast cars passing through the street.

With the proposed students' guidelines for re-design, Qatar's road users will benefit from improved road safety, reduced traffic congestion and more environmentally friendly driving, all enabled by better developed roads. Moreover, the research project strives to develop awareness-raising messages regarding road safety to help prevent all road fatalities. The aim of the multidisciplinary project is to promote the development of Qatar road safety educational materials and target road safety publicity campaigns. The active competition of Qatar Road Safety Studies Center (QRSSC) requested the students to produce an awareness video which will develop, diffuse, collate, and disseminate information on good practice in road safety education, training, and publicity throughout Qatar (not only in Doha but also in other areas- Al Khor, Lusail, Dukhan).

### **2.3 The Methodology for Interaction / Collaboration**

A structured research method and templates were selected to assess differences in PM strategies of the multidisciplinary research project team, in using PM tools (Gray and Larson 2002). A convenience sample was used to develop the project and collect data from the students, and a report template, a minute of meeting template, a poster and video template.

The research items covered specific areas of project planning and were then analyzed to compare Architecture and Engineering students in their approach to the multidisciplinary project and in the proper application of managerial tools (Meredith and Mantel 2006) of planning scope, time, cost, risk, quality, integration, innovation and technology, and communication. Due to the impracticality of retaining a large number of managerial tools, and developing a comprehensive research, due to the course duration restrictions (i.e., from September to December 2015) only the planning, risk assessment, time scheduling and project controls were included as mandatory managerial tools of the research. The environmental dimensions examining human nature, responsibility, space, and specific/diffuse were omitted.

Instructors provided course delivery to both batches of students through integrated lectures during the course (Gray and Larson 2002) and through readings, educational audio and video materials, and parts of course assignments. From the initial phase of

site analysis, students developed their report, selecting one specific area in Doha, the project title, the group name, and arranging some meetings to define the multidisciplinary collaboration between batches such as project objectives, project methodology and confirmation of each member's role.

Students met in their group approximately twice in a week. They developed a proper agenda each time and discussed it during the meeting. Weekly meeting minutes prepared by the groups described the events of the meeting, starting with a list of attendees, a statement of the issues considered by the participants, and related responses or decisions for the issues, what was discussed and achieved since the previous week, and what were the outstanding items to be completed before the next meeting. All meeting minutes were signed by each of the participants before the start of the next meeting. The meeting minutes were collected in a report to monitor the progress of the work; the report was checked against a rubric on written reports.

During the entire semester three main cycles of development and review in the students' proposals and projects were arranged:

- Initial proposal for collaboration between students to identify their role within the group and the new proposed ideas within the selected area of study.
- First project submission including the report meeting minutes; collected data from surveys and interviews; the progress of their project related to urban fabric analysis; and studies to investigate the level of road safety in different zones of Doha, Qatar.
- The progress project's submission and the final submission, including the requested deliverables such as the final report, poster and video for competition, conclusions and final recommendations.

The progress of the submissions phases were discussed within the multidisciplinary groups of students, based on the influential work of each group member, and many samples of projects under construction in Doha, Qatar. Linking multidisciplinary to project outcomes was problematic since many changes in definitions, assessment and numerous factors concerned rose up during the project between groups (Turner 1999).

## **2.4 Success Criteria**

There were two types of success criteria. The first one was the project management success criterion that was related to the students' capability in running the project using the available managerial tools, which meant to finish on time, be able to overcome any delays that might occur during the project and get approval for initiation document. The second type was the project deliverable success criteria that were related to quality in the delivered outcomes as a result of the final project. All the deliverables showed the students' ability to understand the basic principles of project and practice management (Milosevic 1999), the initial evaluation of project costs and budgets, the proper use of activity scheduling, ability to allocate resources to the project, and to demonstrate understanding and appropriate use of methods for controlling projects, including cost and time.

### 3 RESULTS

Starting with the financial considerations, regarding the fundamentals of building costs, such as financial feasibility, estimating costs with an emphasis on life-cycle cost accounting, students demonstrated their ability to use the basic principles of architectural practice management such as project planning, time management, risk management, mediation and arbitration, and recognizing trends that affect practice. All the students submitted their project report respecting the deadlines.

Many groups of students interacted collaboratively for the whole duration of the project, not only demonstrating their ability to work in interdisciplinary teams and with other multidisciplinary groups to successfully complete their projects. Particularly for the QRSSC competition, the submitted videos addressed objectives such as raising awareness about the danger of speeding on the road, the importance of wearing seat belts, the importance of using baby car seats (booster) and other measures relevant and useful to road safety in Qatar. All the submitted videos were original, not including pictures or videos from any other sources and not containing any interview and completely shot in Qatar and they can be promote by QRSSC as message for advertising, publicity, and promotional purposes without compensation.

Students provided conclusions and recommendations, demonstrating their ability to recognize the dialectic relationship between Project Management and the multidisciplinary approach to recognize the diversity of needs, values, behavioral norms, and social patterns as they relate to the creation of the safe built environment of roads in Qatar. Some specific recommendations regarding guidelines and standards for road design that arose from the students' projects include:

- Proposing homogenous road sections in the redesign of the road to avoid conflicts with oncoming traffic,
- Proposing street furniture and signs that will avoid unpredictable behavior, will separate vehicle types and will reduce speed at potential conflict points
- Limiting the number of design elements in each category and making them uniform.
- Creating a sustainable safe road network having flow function generated by uninterrupted roads having a distributor function – for the distribution and collection of traffic to and from different directions; and slip roads having an access function which need to facilitate appropriate entrances.

### 4 CONCLUSION

In this paper we have set out to show how the multidisciplinary collaboration between students can enhance research practice in a field dominated by the theoretical approaches of different disciplines. We have also described the methodology used and some of the issues which have arisen in developing this approach and how the research is still facing an initial phase of development, to be further investigated. In giving this partial view of a complex, long-term project it is not possible to describe the full process of evaluation and the outcomes of every single group project in more detail. Only some aspects of evaluation have been referred to briefly and the principle outcomes, but they need to be implemented and investigated through further ongoing multidisciplinary collaborations between students and disciplines in other courses. The

investigation included a wide range of research activities, detailed review of the state of the awareness regarding the road safety in Qatar, and site survey and analysis. However, most of the deliverables and outcomes are still in their preliminary stages.

The managerial tools, deliverables and outcomes are similar to those which might be encountered in normal professional practice. The concept of re-designing for the purpose of road safety as a research activity may be difficult to recognize given this similarity, which establishes the relationship, analogies and differences between theory and practice in project management. As already pointed out, the students, working as researchers, rather than professional practitioners, had the opportunity to use their skills to represent and develop a hypothetical proposition in a form which is widely accessible and suitable for many forms of evaluation.

Despite the fact that previous studies on interaction between theory and practice offered various degrees of value to the research field, some limitations and debates still await further investigation. In addition, the significant changes associated with the construction industry and project management in theory also provide opportunities for future research. All the outcomes need to be further investigated and compared with other similar outcomes from other multidisciplinary projects.

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