# USING SIMULATED PROJECTS TO TEACH PROJECT MANAGEMENT SKILLS

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## ABSTRACT

An increasing number of industries are complementing, or in some cases even replacing traditional postwar divisional structures with project-based organizations. The increase in demand for staff with project management skills, knowledge, and competencies has resulted in a shift in emphasis from training toward a greater prominence in learning. Several authors have suggested the use of projects that require students to work with an external organization to apply the concepts and techniques learned in class. Students will be surveyed as to the benefits of projects in teaching the PMI's nine knowledge areas.
*Keywords: Project management, PMBOK, Teaching Project Management.*

## INTRODUCTION

Project management is a growing trend and more organizations are expecting their professionals to have some experience in this area. An increasing number of industries are complementing, or in some cases even replacing traditional postwar divisional structures with project-based organizations (Whitley 2006). Turner (1993), writing in the context of project management in general, suggests that much of what we now consider in the category of management in the traditional sense could be better handled as a number of discrete projects undertaken using project management techniques. In a large survey study by Whittington et al. (1999) documented the widespread growth of project management and its rising concern as a top management concern.

Students studying project management generally become skilled at carrying out the various activities connected with a project, such as using project task networks and evaluating resources to determine of a SPECIFIC project is likely to meet its budget. In addition they learn how to set

goals, line out the steps of a project, assess risk, and accomplish the goals and objectives of a project.

However, their career advancement in the project management field is likely to depend just as much as on their skills at communications, especially communication with supervisors, project sponsors, and other project stakeholders and learn how to communicate project goals and objectives of projects to project sponsors and stakeholders, as well as project team members.

## PROJECT MANAGEMENT TRAINING

Pinto and Kharbanda called project management an "accidental profession" for several reasons. Foremost, there are few formal programs are associated with selecting and training project managers for the demands of the profession. Second, few individuals grow-up wanting to become a project manager. They state that project management is a profession that is neither well defined for nor well understood by the public. To solve these problems, the Project Management Institute (PMI) has tried to codify the required knowledge areas by developing the Project Management Body of Knowledge (PMBOK).

## TEACHING PROJECT MANAGEMENT

The increase in demand for staff with project management skills, knowledge, and competencies has increased the number of Higher Education Institutions offering project management courses. Naturally, the topics that are taught are shaped by the PMBOK from the Project Management Institute (PMI). It has been suggested that academic courses should not limit their focus only to the content of the PMBOK, but should include new ideas generated from research outputs.

Arguments for change in the profession and project management discipline have been met to some extent by recognition within the profession that it needs to shift its emphasis from training toward a greater prominence in learning. Notwithstanding this, the drive toward a greater focus on learning (and, by implication, teaching) within project management is unlikely to be successful without the support of the most important stakeholder in the learning and teaching agenda: the student (Wearne, 2008).

Of primary importance is that long-held assumptions of the need to "train" project managers to effectively use various and emerging "methodologies" began to give way to a realization that the education of project managers could not be effective if primarily grounded in technical instrumentality.

Some university courses cover some aspects of project management, some do not go into the topic in any depth, and many make it a wholly theoretical exercise, particularly at the post graduate level. Tatnall and Reyes (2005) have found that students, even post graduate students, often lack a practical frame of reference and so if the material is presented only in a theoretical manner, some of the nuances of project management issues escape them.

The challenge of teaching project management therefore is in being able to provide, in a short period of time, a learning process that students can integrate into their own knowledge. In Biggs'

(1999) terms, this means providing a learning environment for students to engage in the deep approach to learning. Thus Hosseini (1993) recommends the following approaches may be used to teach project management courses:

- Lectures
- Questions/answers related to the lecture material
- Short case studies with questions
- Long case studies with questions
- Projects that require students to work with an external organization to apply the concepts and techniques learned in class

Several courses in the Masters of Science program in Project Management at St. Edwards University try to provide a mix of theory and reality, including a significant effort to ensure that communication and team-work skills are improved along with their technical skills in project management by using simulated projects. We define a simulated project as the duplication of an already completed project or potential projects on someone's wish list. Examples of simulated projects include:

- Replacing 500-ton water chillers in the physical plant,
- The construction of a counseling laboratory for the Masters of Counseling program.
- Installing a 10,000-gallon tank to collect rain water from the roofs of buildings

In each case, a group of three or four students have to identify a business case, identify stakeholders, identify the requirements, and create a stakeholder register as well as other documents developed in the planning stage.

To assess the effectiveness of these simulated projects, students will be surveyed as to the benefits of the simulated projects in teaching the PMI's nine knowledge areas.

## THE SURVEY

Data were gathered from students in two separate classes. A questionnaire survey was used to gather relevant data. Earlier work (Ginns & Ellis, 2007, Kember & Leong, 2009, Ojiako et al, 2011, and Chipulu et al, 2011) formed the conceptual basis for the survey questionnaire (see Table 1) used to gather the relevant data. The focus was on the key constructs of student experiences and also a measure of their learning experiences related to the PMBOK's 9 knowledge area. The survey was based on a 5-point Likert scale (Likert, 1932), with the responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Table 1:** Questionnaire framework.

| Characteristics or Construct Measured | Variable Name of Subconstruct | Description |
|---|---|---|
| Critical Thinking | critical_1 | I have developed my ability to make judgments about alternative perspectives. |
| | critical_2 | I have become more willing to consider different points of view. |
| | critical_3 | I have been encouraged to use my own initiative. |

| | critical_4 | I have been challenged to come up with new ideas. |
|---|---|---|
| Adaptability | adapt_more | I have learned how to be more adaptable. |
| | adapt_formulate | I have become more willing formulate and accept alternative and emergent ideas. |
| | adapt_views | I have become more willing to change my views and accept new ideas. |
| Problem solving | prob_solv_1 | I have improved my ability to use knowledge to solve problems in my field of study. |
| | prob_solv_2l | I have improved my ability to collate relevant information to address challenges within my field of study. |
| | prob_solv_3 | I am able to bring information and different ideas together to solve problems. |
| Communication skills | comm_others | I have developed my ability to communicate effectively with others. |
| | comm._ideas | I have improved my ability to convey ideas. |
| Interpersonal skills | interperson_1 | I have learned to become an effective team or group member. |
| | interperson_2 | I feel confident in dealing with a wide range of people. |
| | interperson_3 | I have developed my ability to work in a team. |
| | interperson_4 | I have developed my ability to convey ideas in a team. |
| | interperson_5 | I have developed my ability to explore or embrace alternative ideas when working in a team. |
| | interperson_6 | I have developed my ability to feel as part of a team. |
| | interperson_7 | I have developed my ability to freely work in a team. |
| Project integration | integrate_1 | I now feel I can write or develop a Project Management Plan |
| | integrate_2 | I now feel I can manage the execution, monitoring, and control of a project |
| | integrate_3 | I now feel I can manage the Change Control process. |
| | integrate_4 | I now feel I can manage the Project Close-out |
| Project scope | scope_1 | I now feel I can write or develop a Project Scope Definition |
| | scope_2 | I now feel I can verify the Project Scope. |
| | scope_3 | I now feel I can control the Project Scope. |
| | scope_4 | I have developed my ability to write a preliminary scope statement. |
| | scope_5 | I have developed my ability to write a project charter. |
| Project time | time_1 | I now feel I can define and sequence project activities. |
| | time_2 | I now feel I can identify Activity Duration and estimate required resources. |
| | time_3 | I now feel I can develop and document a Project Plan or Schedule. |
| | time_4 | I now feel I can control a Project Plan or Schedule. |
| Project cost | cost_1 | I now feel I can estimate project costs. |
| | cost_2 | I now feel I can budget project costs. |

| | cost_3 | I now feel I can define project scope. |
|---|---|---|
| Project quality | quality_1 | I now feel I can plan for project quality. |
| | quality_2 | I now feel I can perform Project Quality Assurance |
| | quality_3 | I now feel I can Perform Project Quality Control. |
| Project Human Resource Management | hrm_1 | I now feel I can develop a project Human Resource Plan. |
| | hrm_2 | I now feel I have the ability to Acquire a Project Team |
| | hrm_3 | I now feel I have the ability to Develop a Project Team |
| | hrm_4 | I now feel I have the ability to Manage a Project Team |
| Project communications | communicat_1 | I now feel I can develop a Communication Plan. |
| | communicat_2 | I now feel I can properly distribute Project Information. |
| | communicat_3 | I now feel I have the ability to write a Project Performance Report. |
| | communicat_4 | I now feel I have the ability to Manage Project Stakeholders |
| Project risk | risk_1 | I now feel I have the ability to identify Project Risks. |
| | risk_2 | I have developed my ability to perform a qualitative risk analysis. |
| | risk_3 | I have developed my ability to perform a quantitative risk analysis. |
| | risk_4 | I have developed my ability to develop contingency plans. |
| | risk_5 | I now feel I have the ability to Monitoring & Control Project Risks |
| Project procurement | procure_1 | I now feel I have the ability to Plan Project  Purchases & Acquisitions |
| | procure_2 | I now feel I have the ability to develop and plan a project Contract. |
| Project initiation | initiation_1 | I now understand the function of the Business Case. |
| | initiation_2 | I now feel I can write a Business Case. |
| | initiation_3 | I can now identify the various stakeholders and their function. |
| | initiation_4 | I now have the ability to communicate the various stakeholders. |
| | initiation_5 | I can now develop a responsibility matrix. |
| | initiation_6 | I can now interview the various stakeholders to identify project requirements. |
| | initiation_7 | I have developed my ability to develop a work breakdown structure. |
| | initiation_8 | I have developed my ability to write a statement of work. |

## QUESTIONNAIRE ANALYSIS AND RESULTS

The reliabilities of the scales in the questionnaire were checked using Cronbach's α values. An ANOVA will be conducted on the survey results to determine if the benefits of the simulated projects universal, across the groups, or are the benefits related to particular groups. The results will be available at the Conference.

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