

# Experiential Learning in Project Management Education

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## STRUCTURED ABSTRACT

### CONTEXT

Project Management (PM) is a relatively new discipline that has experienced significant growth and acceptance over the last decade. The advance of the PM profession can be related to the continual evolution of the field from its engineering origins into a generally applicable management discipline. The increasing adoption and genericity of PM has seen the Project Management Institute (PMI) predict a significant talent gap with over 15 million new PM roles projected to be added globally by 2020. The growing demand for project managers has given rise to significant changes in PM education and the development of project professionals.

### PURPOSE

The research question to be addressed is how the practice-oriented discipline of PM, can utilise experiential learning in Capstone projects to improve the learning outcomes of inexperienced PM students.

### APPROACH

The role of Universities in the formal education of PMs has increased in recent times, marking a shift from previously offered technical PM training and professional certification - usually taken as an adjunct to on-the-job training. The need to educate PM concepts and tools to inexperienced students represents new challenges to educators. Capstone projects presents an opportunity to investigate PM students' perception of the value of experiential learning in acquiring practical PM competencies.

The contribution to knowledge this paper makes is to explore effective pedagogies appropriate the education of inexperienced project managers. Mixed methods are applied, including a student survey supplemented by focus groups, to collect the perceptions of the PM students about the learnings from their Capstone unit.

### RESULTS

The evolving approach to PM education is discussed with the unique challenges of coordinating a PM Capstone unit that offers an experiential learning opportunity for students. Preliminary findings from a pilot study of PM Capstone students are presented that indicate that while student assessment is a significant concern, they felt it developed their communications and leadership abilities while increasing confidence in their PM capabilities.

### CONCLUSIONS

The study indicates the value of PM Capstone units and the key role they can play in the PM curriculum. Resolution of the unique challenges to experiential learning in PM Capstone units needs further research adopt the appropriate pedagogies and assessment methods. This study has wider relevance to the PM profession as it can help set expectations for University PM programs and the job-readiness of future project managers.

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## KEYWORDS

Experiential Learning, Project Management Education. Capstone Projects

## Introduction

Once upon a time, a project manager could only gain that designation after several years of distinguished experience in their chosen industry. Technical skills like engineering would be rewarded with a promotion to the role of project manager. Only two decades ago, senior managers rated technical competence as the third highest rated characteristic of an effective project manager (Zimmerer & Yasin, 1998). While this appears a high ranking, the authors viewed that as evidence of the waning influence of “technical skills and knowledge of the industry” as a criteria for project manager selection - the other eight out of nine characteristics were managerial in nature. They suggested the results reflected “a basic understanding that effectiveness is directly related to the ability of the project manager to lead and manage more than simply possess exceptional technical skills.”

The role of PM continues to evolve and growing demand (PMI, 2017a) has resulted in new educational pathways for aspiring project managers. The introduction of PM undergraduate degrees, and masters programs for graduates with little or no work experience, is a relatively recent situation that requires more investigation and pedagogical research. While PM courses once trained individuals after several years of work experience in which they had to show proficiency, tertiary education of PMs often reverses that situation.

We now find ourselves in the age of generic PM (Basner, 2008; Crawford & Pollack, 2007) where students can be trained only in PM skills and practices as encapsulated by the PMI's Project Management Body of Knowledge (PMBOK). This is happening even as PMI's own Talent Triangle (PMI, 2017b) formally recognises that a Project Management Professional (PMP) requires PM skills in equal measure with leadership and business competencies.

With PMI's relatively recent establishment of a framework for PM curricula (Kanabar et al., 2014), many Australian universities now offer PM degrees which enrol undergraduate students straight after high school. Students choosing to major in PM may graduate without a deep knowledge of any specific technical or industry domain; effectively making them generic project managers. Similarly, postgraduate programs enrol recent graduates with degrees in other disciplines into PM Graduate Diploma or Masters Programs; their limited work and life experience essentially presenting PM educators with similar challenges as undergraduate students.

While technical proficiency in a domain may now be viewed as less important to being seen as an effective PM, we know little about the pedagogies that are appropriate for these new circumstances. Even where we might understand the competencies required of a successful PM practitioner (Cartwright & Yinger, 2007; Vukomanović, Young, & Huynink, 2016) the educator's challenge is to help create such an individual. The significant increase in demand for PMs and the resulting interest in the generic discipline as a career choice requires that we adapt our educational approach to the new situation and ensure that educational institutions prepare their PM graduates with the requisite skills and competencies to enter the workplace.

Capstone units have been used by PM educators as an integrative course at the conclusion of the PM curriculum for some time (Cesario, 2001). This paper aims to investigate the perceived effectiveness of this project-based, experiential learning approach to better understanding its role in the education of a new generation of PMs. Specifically, we aim to assess the relative value of the experiential learning over traditional lecture-based teaching in the PM curriculum. To achieve this, we describe an evolving methodology and overview preliminary results capturing the challenges faced by educators in the design and delivery of effective capstone units, and the perceptions of PM students undertaking these programs.

## Methodology

As a relatively new management discipline taught at tertiary level, educators have studied the application of different approaches to teaching PM knowledge (Shelley, 2015). Our research objective is to improve the learning outcomes for PM students, specifically those taking the project-based Capstone units (Schwering, 2015) which provide an opportunity for experiential learning (Kolb, 1983).

Our research was undertaken in first semester of the 2017 calendar year, with consenting PM Masters students at the University of Sydney. These students were enrolled in the Capstone unit in their final semester of the inexperienced PM Masters Program. The Capstone unit has a duration of 15 weeks inclusive of assessments, and is designed to allow students to work in small groups to undertake a real-world project. The Capstone project provides an opportunity for student to consolidate and apply the PM knowledge acquired in earlier units of study while reflecting on that experience.

Our research design seeks to assess and analyse the student reflections provided as a part of the Capstone unit, supplemented by focus groups designed to inform the research question. Ethical approval for this study was received the Human Research Ethics Committee of the University of Sydney [2017/159] after satisfying concerns about conducting research with students whose work is also subject to assessment. The conditions stipulated by the ethics committee has meant that participation has been limited to those students who provide consent after their student marks have been published and can make themselves available to participate in the research. These constraints have resulted in refinement of our methodology with more structured reflections being required of all Capstone students which serves the dual purpose of better guided student reflections, while collecting their perceptions of the experiential learning offered by their Capstone project. The student reflections represent the data which is to be analysed as a part of the research program; supplemented where possible with focus groups.

This paper describes the first iteration of our research study undertaken at the end of the first semester of 2017 with PM Masters students who completed the Capstone unit. A description of the PM Capstone unit and the challenges provides context for the particular circumstances facing educators. We then present preliminary findings based on qualitative analysis of student reflections and the results of a focus group comprising five students. While a small sample, this does provide a pilot for our research approach with the initial content categorisation offering early insights into the experiences of PM Capstone students. The results also serve to inform and guide our ongoing research into experiential learning, the refinement of PM Capstone units and the wider challenges faced by PM educators.

## Capstone Challenges

While PM has a growing set of underlying theoretical constructs that have seen it become a vibrant area of research, it remains a highly practical discipline. Prior to formal degree-level PM courses being introduced in Universities, PM education was provided by technical institutes like the Tertiary and Further Education (TAFE) colleges or professional education bodies.

The PMI has been instrumental in this evolution with the introduction of the PMBOK, and more recently the formation of the Global Accreditation Centre (GAC) responsible for accrediting PM related degree programs in universities. While Capstone projects are a recognised part of the PM curricula (Cesario, 2001; Fan, Thomas, & Anantatmula, 2014), they do present some unique problems for educators.

Teaching PM generically as a management discipline independent of a specific industry domain serves to make coordinating PM Capstone units themselves unique. While this is a consequence of the modern, multi-disciplinary nature of PM, it means that there can be

peculiarities in the selection and execution of Capstone projects – which in turn provide PM educators with challenges in assessing the students.

In a PM Capstone, it is the application of PM methods to the project itself that is a key learning outcome; rather than delivery of the desired product that is the project's scope. This has the benefit of giving greater choice to PM students, allowing them to select projects from any area, on a range of topics – because the topic itself is a secondary objective to the application of PM principles to the exercise. One consequence of this is that the tension between the need to produce plans and status reports for the initiative which can result in the teams neglecting to provide the promised benefits to project sponsors. While this tension between planning and doing may also be found in PM professionals, educators must be on guard that assessment methods do not have the unintended result of making students focus on the creation of PM artefacts at the expense of delivering on the project scope and goals.

Perhaps one of the biggest challenges faced in the Capstone unit is finding suitable real-world projects for the students to undertake. While many institutions put the onus on students to bring their own topics for their Capstone projects, this is not realistic for inexperienced students who do not have an employer's workplace from which to source projects. As a result, some institutions distribute the problem of finding suitable candidate Capstone projects across the resident academics, with mixed success. From experience, these projects can be limiting, offering students' highly specialised topics that advance the research interests of the sponsors with limited opportunities to apply and exercise the students' PM competencies. Given the nature of a PM Capstone project can be about anything (so long as there is an opportunity for students to plan and execute the scope within the course's timeframe) we have looked to source real-world projects from local, not-for-profit (NFP) organisations including local PM industry bodies, that has the benefit of providing students the experience of working with external sponsors who expect an outcome from the project.

The fact that a Capstone project's learning outcomes and assessments are necessarily biased (60:40 in our units) towards the creation of PM artifacts rather than delivering the sponsor's required scope, meant that students acknowledged they looked to select simpler projects at the start of the Capstone course. Assessing the value the student teams provided their sponsors is a difficulty faced by markers due to the variability between the projects. This is compounded by the fact that the sponsor's feedback can be unreliable and overly generous as they do not want to negatively affect the students' marks.

The execution of the Capstone project by a team, or groups of students represents another contentious and challenging aspect of a Capstone unit. Our PM Capstone program requires projects to be conducted in groups of 4-6 students who must together work to deliver the sponsor's requirements. Special consideration may be given in exceptional situations, but by default, all PM Capstone projects are conducted in groups. We are aware that not all PM Programs insist on Capstone projects working in teams and some Universities have policies on individual assessment that discourage group work due to the difficulty of gauging an individual student's contribution. Yet, most projects in the real-world are undertaken by teams which surely encounter similar difficulties in rating the contribution of individuals to a team's overall performance.

If teamwork is challenging to assess, the team formation process also presents a dilemma. Many units of studies allow the students to form their own teams, where they work with their friends or develop collegial relationships, and as a result, students prefer to work with these colleagues for their PM Capstone projects. While allowing students to self-organise and select their own teams is clearly the path of least resistance for a Capstone coordinator, this is not generally an option in industry where teams are more likely formed based upon the availability of resources. As a result, our Capstone program has chosen to form teams based on a matching algorithm that can assign teams based on selected individual characteristics so these teams are balanced in some capabilities (e.g. English language skills) yet share other characteristics in common (e.g. prior grades or degree of commitment).

We currently utilise the CATME team formation and peer-evaluation software (Ohland et al., 2012) in our Capstone units, which provides a means of creating compatible groups and moderating group assessments based on the teams assessment of each member's contribution.

## Student Perception of Capstone Projects

Initial content analysis of the Capstone students' reflective diaries and the one focus group conducted indicate that the students have some strong views on their Capstone project experience. The following lists the preliminary findings which indicate the themes that the authors hope to explore further as more student data is collected:

- Challenges of teamwork in Capstones

By far the most frequently raised concern of the students was the formation and performance of Capstone teams. Complaints of team members not doing their share, not being capable or simply wanting to do the bare minimum were common. Even as peer-assessments were used to mitigate the problem of unequal contribution by students (Rainford, 2014) the students feared that their results were negatively impacted by poorly performing team members and so the quasi-random team formation method described above was challenged on several occasions.

- Development of communications and soft-skills

Even as students reported frustration working with their team members and sometimes difficult sponsors, they often concluded that the experience provided them valuable learnings. While they lamented issues they faced with team members, like similar project-based learning studies (Jollands, Jolly, & Molyneaux, 2012), the students felt this challenged them to be better communicators and find ways to motivate and lead their team. Some other examples of learnings included the routine acts of writing emails to sponsors and preparing for or recording meeting minutes.

- Value of Capstone units relative to other PM units

When asked specifically about the value they felt their experiential Capstone offered over the other traditionally thought PM units, the common answer was that it provided the opportunity to practice or acquire new soft-skills. This was balanced by the opportunity afforded to plan and execute a small-scale project end to end but the value was moderated by the nature of the specific project the students worked on.

- Range of Capstone project candidates

Students felt that there was variability in the Capstone projects that the different teams worked on and some were too simple or uninteresting. When probed "simple projects" appeared to be projects that related to organising events or undertaking marketing activities for PMI or NFP sponsors. They reported that the PM methods "overloaded" these smaller projects that did not appear to need the full range of PM deliverables that their assessments required. There was also a dependency on the project sponsor with students reporting that there was "not a sense of urgency" about some projects. The suggestion was made that projects from different industries should be offered for those who wanted to exercise their skills in specific domains.

- Job readiness

Without significant work experience of their own, the students found their Capstone project provided them with evidence of an actual project of undertook that they could discuss in job interviews. Even as there is debate about the role of universities in making its students work-ready (Moore & Morton, 2017) this view supports earlier finding that project-based learning experiences are important for developing communication skills (Jollands et al., 2012) and the Capstone unit can help students gain practical experience

to meet expectations (Hussain & Mohamad, 2015). Students presenting their Capstone posters to industry professionals at PMI Chapter events found the opportunity to exercise their communication skills invaluable, pointing to future collaboration opportunities for educators to work more closely with industry bodies.

- Results of undertaking Capstone unit

Asked how the Capstone project changed their perception of their own capabilities, the focus group participants broadly felt that it improved their personal confidence. What they had learned in traditionally taught units seemed theoretical with the Capstone providing them opportunity to apply their PM knowledge and use it to achieve an outcome. Even as they acknowledged that the one-semester project was only modest in scale, it went through all the project phases from initiation to delivery. This offered students the opportunity to practice what they had learned and therefore gain a better understanding and appreciation of the PM role.

## Conclusions and Limitations

The preliminary results reported in this paper indicate that PM students undertaking the one-semester Master Capstone unit had concerns relating to teamwork and assessments, but overall found value in the experience which gave them the opportunity to apply and consolidate their learnings from the more traditionally taught PM units. In addition, students reported that their Capstone project provided real scenarios and learning that they could use in job interviews to demonstrate their PM knowledge.

Our research results have the limitation of a small sample size that potentially suffered from selection bias as participation was voluntary and only the more dedicated and engaged students attended the focus group. However, our research is ongoing and the richness of the student feedback provides confidence that the methodology is sound. Even with limited data principally from a single cohort of Masters students, we believe our findings offer important pointers to the value of incorporating greater experiential learning opportunities for inexperienced PM students – potentially beyond just the Capstone units this research was focused upon.

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