DEVELOPING PROFESSIONAL PROJECT MANAGERS: THE USE OF PRACTICE-ORIENTED LEARNING

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Abstract

One of the main challenges in learning and teaching is to create and deliver subjects which enhance scholarly pursuits in contemporary project management. [1] states that "…the way we deal with and build knowledge, learning and competency development is key..'' [1, p. 22] to the delivery of business performance through project management. In the spirit of Morris' view, I have explored how students in an Australian University might gain an appropriate amount of the contemporary advanced body of knowledge in the project management discipline while integrating such learning with practical experience and methodology to continue to extend their learning in both contextual and academic ways. To that end, I have shaped two courses in a way which integrates and extends students' knowledge and skills and also provides them experience in managing the dynamics of intercultural relations and ways of reflecting on experience in order to achieve higher orders of professional competence and intellectual development.

This paper will explore two post graduate subjects 'Project Management Principles' and 'Project Management Practicum'; identify uniquely aggregated material by combining theory with practice using 'real-life' projects involved with established clients from industry; and explain reflective, culturally diverse, team-oriented and collaborative learning environments. Subject-specific assessments are embedded to achieve Course Intended Learning Outcomes aligned to the required university Graduate Attributes. The Graduate Attributes that students develop in these subjects include: critical thinking and research skills; creativity and innovation; communications and interpersonal skills; attitudes and values, and practical and professional skills.

The following criteria will be examined within these two project management subjects that students undertake as part of a Graduate Certificate or Masters of Project Management:

1. Approaches to teaching and learning and/or to teaching and learning support that influence, motivate and inspire students to learn
2. Development of curricula and resources that reflect a command of the field
3. Scholarly activities and service innovations that have influenced and enhanced learning and teaching.

I will demonstrate that the structure of these subjects "…supports learning in a domain by enabling students to acquire, develop and use cognitive tools in authentic domain activity." [2, p. 39].

Keywords: Project management curricula, student motivation, teaching resources, scholarly innovation.

1 EDUCATING THE PROJECT MANAGER IN AUSTRALIA

When educating project management students about how to manage projects, education providers in Australia need to adhere to a broad level of post graduate skills as defined by the following statements [3, pp. 15-18]. The Australian system is structured with a hierarchical approach of multiple educational qualifications.

1.1 Bachelor Degree

A Bachelor Degree follows secondary school or technical and further education and can be completed between in three to four years. This qualification is designed to qualify individuals who apply a broad and coherent body of knowledge in a range of contexts to enter professional work and/or as a pathway for further learning. Graduates of this qualification type will have a broad and coherent body of knowledge, with depth in the underlying principles and concepts in one or more disciplines as a basis for independent lifelong learning. They will be able to apply knowledge and skills:

- using judgement and initiative in professional practice and/or scholarship;
- to adapt knowledge and skills in diverse contexts, and
- to take responsibility and accountability for own learning and professional practice and collaboration with others within broad parameters.

1.2 Graduate Certificate

A Post Graduate Certificate follows a Bachelor Degree or an associated Diploma and can be completed between six months and one year. This qualification is designed to qualify individuals who apply a body of knowledge in a range of contexts for professional or highly skilled work and/or as a pathway for further learning. Post graduates of the qualification type will have specialised knowledge within a systematic and coherent body of knowledge that may include the acquisition and application of knowledge and skills in a new or existing discipline or professional area. They will be able to apply knowledge and skills:

- to make high level, independent judgements in a range of technical or management functions in varied specialised contexts;
- to initiate, plan, implement and evaluate broad functions within varied specialised technical and/or creative contexts, and
- to demonstrate responsibility and accountability for personal outputs and all aspects of the work or function of others within broad parameters.

1.3 Graduate Diploma

A Post Graduate Diploma follows a Bachelor Degree or an associated Diploma and can be completed between one and two years. This qualification is designed to qualify individuals who apply a body of knowledge in a range of contexts for professional or highly skilled work and/or as a pathway for further learning. Post graduates of the qualification type will have advanced knowledge within a systematic and coherent body of knowledge that may include the acquisition and application of knowledge and skills in a new or existing discipline or professional area. They will be able to apply knowledge and skills in the same way as expected for 1.2 Post Graduate Certificate:

1.4 Master's Degree

A Master's Degree follows a Bachelor Degree or an associated Post Graduate Certificate or Diploma and can be completed between one and two years. This qualification is designed to qualify individuals who apply an advanced body of knowledge in a range of contexts for professional practice or scholarship and/or as a pathway for further learning. Post graduates of the qualification type will have a body of knowledge that includes the understanding of recent developments in a field of knowledge and/or area of professional practice. They will be able to apply knowledge and skills:

- to demonstrate creativity and initiative in the application of knowledge and skills to new situations in professional practice and/or for further learning;
- to demonstrate high level personal autonomy and accountability, and
- to demonstrate the planning and execution of a substantial research-based project, capstone experience or piece of scholarship.

1.5 Doctoral Degree

A Doctoral Degree follows a Master's or Honour's Degree and can be completed between three and four years. This qualification is designed to qualify individuals who apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation. Post graduates of the qualification type will have a substantial body of knowledge at the frontier of a field of work or learning, including knowledge that constitutes an original contribution, and substantial knowledge of research principles and methods applicable to the field of work or learning. They will be able to apply knowledge and skills:

- to demonstrate initiative and creativity in new situations and/or for further learning;
- to demonstrate full responsibility and accountability for personal outputs;
- to demonstrate the planning and execution of original research, and
- to demonstrate the ongoing capacity to generate new knowledge.

In addition to meeting the Australian Government stipulated Vocational and Educational and Training sector requirements, the educational aims of a university course need to be made available to the students. These are often referred to as the 'graduate profile' which provides the student with a guideline on what attributes, or characteristics, they can expect to have gained after completing their course of study. These attributes can be aligned to a specific discipline or professional standard or character and it is expected that the post graduate will be able to contextualize their learnings to meet the demands of a changing environment.

There is a concern as to the validity of a technical approach to acquiring skills at a post graduate level [4] and if the focus on skills encourages reflective development as described in the 'Rethinking Project Management' Agenda [5]. The work advocates a somewhat linear progression from a Novice project manager to an Expert requires the novice to progress from learning the rules before they can begin to undertake "…participative critical reflection over the intuition" [6, p. 680] of themselves and the group. This progression using an adaptive learning process provides a framework for the development of a project manager from a technician to a reflective practitioner and is included in Appendix 1 for reference.

An adaptive learning process to educate and advance a novice project manager can be achieved through actively engaging them in Problem-Based Learning activities. The advent of Problem-Based Learning as an approach to education was introduced in the late 60's in North America for medical education, was effective and widely accepted. What has evolved over the last two generations of students is a learning structure in which to start the novice or 'apprentice' on their learning journey they are given a problem to solve, either in groups or individually. This simulates 'real life' for students to apply the learnt theories in a controlled environment. Boud and Feletti [7, p. 2] identified the characteristics of Problem-Based Learning as an approach to education by:

- Using stimulus material to help students discuss an important problem, question or issue;
- Presenting the problem as a simulation of professional practice or a 'real life' situation;
- Appropriately guiding students' critical thinking and providing limited resources to help them learn from defining and attempting to resolve the given problem;
- Having students work cooperatively as a group, exploring information in and out of class with access to a tutor (not necessarily a subject specialist) who knows the problem well and can facilitate the groups learning process;
- Getting students to identify their own learning needs and appropriate use of available resources, and
- Reapplying this new knowledge to the original problem and evaluation their learning processes.

As a result of giving the student a choice in their learning environment they are more likely to be able to competently manage change. This can be seen in their decision making ability in unfamiliar situations where the student attempts to make reasoned decisions based on critical and creative reasoning. Such self-directed learning is a way of dealing with problems empathetically and in a group situation and provides opportunities for students to collaborate and manage the process holistically. On an individual level the student can reflect on their own strengths and weaknesses that are managed so that the team can deliver the required outcomes.

The use of Problem-Based Learning techniques is underpinned by the constructivist approach which defines learning as an "…active process in which learners construct new ideas or concepts based upon their current /past knowledge" [7, p. 126]. The educational theories behind this approach have been summarised in the following Table 1 [7, p. 128].

Table 1: Educational Theories on Constructivist Problem Based Learning.

Principle	Approach
The Principle of Multiplicity	Every person sees the world in different ways and there is no one 'correct' answer, leaving room for multiple and varied applications.
The Principle of Activeness	The student takes an active learner position rather than a passive receiver of information.
The Principle of Accommodation and Adaption	To establish personal meaning the student links abstract theories with past learnings and current experiences
The Principle of Authenticity	The learning environment and activities need to provide the student with real experiences at the whole task and sub task level.
The Principle of Articulation	The interaction of students through sharing their learning content and procedures to develop collective understanding.
The Principle of Termlessness	Students' learning is not bound by the educational schedule as it is self-directed and hopefully life-long.

As an extension to Problem-Based Learning, Project Based Learning has been developed as "…the theory and practice of engaging in time-limited projects to achieve specified or emergent performance objectives (project deliverables) and to facilitate individual and collective learning" [8, p. xi]. There is an additional approach that can be drawn from Project-Based Learning that deals with ambiguity as a "central learning trigger" [8, p. 12]. The first trigger, Leadership Ambiguity, deals with the student wanting to know where they are going. Through an absence of direction, the student must observe, participate, experiment and intervene to make choices with the available resources. How should the students proceed leads to Process Ambiguity, where students work towards milestones but are not given direction on how to achieve them. Finally, Performance Ambiguity requires the student to define what success is to the project and how it will be measured.

2 OVERVIEW OF TWO PROJECT MANAGEMENT MASTER'S DEGREE SUBJECTS

Learning and teaching practices are the focus of developing professional project managers using practice-oriented learning. An explanation is provided below of the development and delivery of a foundational and a more advanced subject in the post graduate project management master's degree at an Australian University. 'Project Management Principles' is a pre-requisite subject that introduces the concepts of project management, and 'Project Management Practicum' is a subject offered to Masters level students to apply the foundational concepts to a range of local and international projects.

'Project Management Principles' introduces concepts of project management in a four-day block workshop. I encourage additional learning by extending the class day through voluntary evening tutorials. Students work on a 'real-life' team project to apply theory and stimulate learning in a simulated project environment. Through my extensive contacts in the project management profession, a 'real-life' project is sourced from a range of industry sectors and professional bodies who require a project to be delivered. Initially, students form into project teams and participate in the activity that exposes them to the diversity of the cohort. The experience prepares the students to balance teams according to sector experience, language, and gender. Once formed into project teams, students experience a real 'client' briefing on the afternoon of the first day of class. As they learn theoretical knowledge throughout the workshop, the students participate in a range of activities that build toward the delivery of a successful project outcome intended to achieve high quality of thought, communications excellence, and client usability. Finally, project teams present their work to the industry 'client' that has the appropriate level of project management experience, contemporary knowledge, and decision making authority. The impact on student learning is assessed in a post-presentation submission of their individual assignment where the students reflect on learnings from the team project and is submitted electronically several weeks after the block workshop. This assignment is designed so students author their own 'Professional Development Plan' where they apply the knowledge learnt in the workshop to their own career goals.

'Project Management Practicum' simulates the project environment where students apply more advanced project management concepts and theories to a project which they independently source from industry. Students attend evening lectures and present project progress updates to the class to demonstrate an understanding of the topics covered. They explore, integrate and collaborate on issues through an online discussion forum over a 13 week semester. Inevitably, external factors in their diverse and complex work environment result in changes to their project and students need to adapt accordingly. Students apply their learnings through input from fellow students and the lecturer, and this provides additional options to assist in managing their dynamic project. The assessments cover the online discussion, the final presentation and project plan, and several weeks after the lectures finish, students submit a reflective post project review to demonstrate captured learnings from their collaborations in class.

In both subjects, students actively engage with their diverse cohorts, industry, and academics to simultaneously apply and demonstrate their ability to think critically, communicate, and act professionally. The student's learning is measured against assessment criteria based on the Course Intended Learning Outcomes that align to the Graduate Attributes for the subject. Working on 'real-life' projects provides the students with practice-oriented education in a supportive and dynamic learning environment.

3 APPROACHES TO TEACHING AND LEARNING THAT INFLUENCE, MOTIVATE AND INSPIRE POST GRADUATE STUDENTS TO LEARN

The broad range of knowledge and experiences in the student cohort can span from new graduates with only six months' work experience to 'veterans' of project management who may be entering university for the first time in many years, to those who have never engaged in studies in a higher education environment. All have one common goal – to learn, and my role is to provide a stimulating and challenging environment using dynamic and multifaceted modes of practice-oriented education and peer learning.

In both subjects, 'Project Management Principles' and 'Project Management Practicum', 'real-life' projects and clients, coupled with group and peer-centred learning activity, address a rich and broad spectrum of learning experience which underpin the technical and managerial knowledge development. Following completion of one of these real-life projects, I received a letter from the Chair of a professional project management association, the Australian Institute of Project Management. The letter says "On behalf of the Australian Institute of Project Management….we were overwhelmed by the consistent high calibre of submissions demonstrating their project management knowledge. The work of the students has delivered a wealth of options on how the Women in Project Management Community Giving Program can be delivered, and given us a great start on making our dream a reality." In the subsequent semester, several students took their learning further after the subject had finished and continued to implement the industry project on a voluntary basis.

The students also find this approach to teaching and learning inspirational, based on the following feedback:

> *"I wanted to thank you very much for the workshop last week. I transferred to a Masters of Project Management this semester … I am extremely grateful for the dedication of the lecturers and the manner by which we as students felt encouraged, appreciated and engaged by a well prepared workshop." Project Management Principles - Student A*

To motivate students enrolled in 'Project Management Principles' to translate their workshop learnings in a meaningful way, they develop a Professional Development Plan as their final assignment. The students apply the knowledge they have learnt in the workshop to develop a project plan for their future career development, including a reflection on what they learnt from their team assignment. The creation of a personal development plan allows students to assess their own plans and ambitions and include a variety of experiences from the course to compliment their own abilities and have a roadmap to assist them in the early stages of their career in project management.

4 DEVELOPMENT OF POST GRADUATE SUBJECT CURRICULA AND RESOURCES

The student's ability to collaborate and reflect is essential to the practice of managing projects, as [5] state that project managers must be capable of approaching complex projects reflectively while also

pragmatically applying theory in practice. The measure of the success of projects is intrinsically linked to their ability to conceptualise projects from different perspectives, read situations, define the problem, deal with ambiguity, relate to wider issues, and be politically astute.

After the post graduate project management students have completed the first four core subjects they may select from a range of more advanced subjects in the degree. In 'Project Management Practicum', the students have an opportunity to develop from 'trained technicians' to 'reflective practitioners' [5] over a 13 week semester. Evening lectures provide a forum for complex projects to be approached reflectively while also pragmatically applying theory to practice. This is achieved through topic-specific lectures and student presentations on project progress which simulate the project environment. Issues are managed between lectures using online discussion forums, and the review and incorporation of student contributions is reflected on in their final assignment. The multi-faceted approach to this collaborative format encourages students to reflect on their practice and develop their critical thinking capability in dynamic and diverse environments in the workplace and at the university.

Using practice-oriented curricula in a supportive and dynamic environment has been well received by the students, as demonstrated in the following statement:

> *"I thoroughly enjoyed this subject - easily the best subject I have taken so far during my post-graduate studies. In particular, I enjoyed implementing the tools learnt in this course (and previous courses) in a real project rather than a hypothetical case study. In my case, I undertook a project in an industry in which I had very little experience, however, being able to discuss the project within the class, with other classmates and the teaching staff allowed me to go back to my role within the project and make changes to the project as it progressed". Project Management Practicum - Student B*

5 SCHOLARLY ACTIVITIES THAT HAVE INFLUENCED POST GRADUATE LEARNING AND TEACHING

Students are led through scholarly engagement using current research, group/peer learning, technological innovations, and mentoring initiatives. The students in subject 'Project Management Principles' prepare for the block workshop by completing questionnaires that provide them with an indication of their preferred learning styles and teamwork profile. Using this deeper understanding of their behaviours the students prepare a reflective report on possible alternate outcomes on a project of their choice for a pre-workshop assignment. The results of the questionnaires also provide the basis for the students to form balanced teams to work on a 'client' project during the block workshop. A nine year research study on building effective teams by [9] is used as the model to form teams in this subject. Recent research confirms that "…the practical implications of the model for the measurement of team roles are substantial" [10, p. 111].

The use of technology in the 'Project Management Principles' block workshop sees students apply their learning to prepare and deliver their final 'client' presentations. Students use computer labs, student breakout pods, online software tools such as 'On the Spot Systems', and surveys to interact with each other, the lecturers, and the 'client'. This requires me to mentor each team and the individual students to access and utilise technology that will enhance their output, in both the verbal presentations and written reports to the 'client'.

The influence that this teaching has on student learning can be seen in the following comment:

> *"I am grateful to have the opportunity you gave us to work on a practical situation that can be beneficial to a real organisation. I really appreciate that you have kept us in the loop and once again thank you for all your support ….it has been definitely an amazing learning experience." Project Management Principles Student C*

6 CONCLUSION

This paper presented a perspective on learning and teaching project management at a post graduate level at an Australian university. An overview of the hierarchical approach used in the Australian higher education system was described with the frameworks presented for a Bachelor's degree; a Graduate Certificate; a Graduate Diploma; a Master's degree; and a Doctoral degree. The exposure of

students to Problem-Based and Project-Based Learning demonstrated how learning can be structured to simulate real-life experiences.

To demonstrate how Australian students learn within this hierarchical structure using simulated real-life experiences, two project management master's degree subjects were presented. It was demonstrated through the subjects 'Project Management Principles' and 'Project Management Practicum' that post graduate students at an Australian University extend their learning of the subjects through the integration theory and practice to deliver projects for actual clients. As happens in practice, the students negotiate challenges in the dynamic project environment to deliver subject-specific assessments that meet the academic requirements and the client's needs.

The examination of the post graduate subjects provided evidence of the approaches to teaching and learning that influence, motivate and inspire students to learn. This was evident in the development of curricula and resources, such as technology combined with specific questionnaires that reflect a command of the field of project management. The application of these scholarly activities and service innovations were shown to influence and enhance learning through representative student statements, noting that "a teacher affects eternity; he can never tell where his influence stops." Henry Adams, American historian (1838 – 1918).

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APPENDIX 1: EXPERTISE, COMPETENCE AND KNOWLEDGE IN PROJECT WORK AND MANAGEMENT [6]

Level	Experience	Action based on…	Comment
Novice	Faces a given problem and a given situation in a given task area for the first time.	• Instructions (training course, PMBOK® Guide). • Learning to recognise objective facts about and characteristics of the situation (models and definitions of project). • Learning rules of action, as generalized for all similar situations on the basis of identified facts, thus context-independent (project management methodology, procedures, best practice). • Evaluating the performance of the skills on the basis of how well the learned rules are followed.	The rules are necessary for gaining initial experiences but they can quickly become a barrier to acquiring skills at higher levels.
Advanced Beginner	Achieves some real-life experience.	• Learning to recognise relevant elements in relevant situations on the basis of their similarities with previous examples (typology of projects). • The context of experience becomes important and decisive in the choice of relevant elements, in addition to context-independent rules (learning from experience, limited reflection) PMBOK® trial and-error.	Personal experience via trial and error becomes more important than context-independent, verbally formulated facts and rules.
Competent Performer	With more experience the number of recognizable elements and facts becomes overwhelming.	• Learning from own experience and from others to prioritise elements of the situation. • Organizing information by choosing a goal and a plan. • Dealing only with a set of key factors relevant to the goal and plan, thus simplifying the task and obtaining improved results. • The choice of a certain goal and plan and the need to have a plan is paradoxical (simultaneous subjectivity and objectivity) – it is not unproblematic and requires deliberation, the relationship of involvement between performer and environment. • Elements-rules-goals-plans-decision: the model of analytical, proficient performer. • Ability to think on one's feet (confidence, reflection, choice of action and risk taking).	The individual learns to apply hierarchical, prioritising procedure for decision-making on the basis of set priorities rather than on total knowledge of the given situation. Choosing the goal and plan is not unproblematic – it implies personal involvement in actions, hence responsibility/ ethics.

Proficient Performer	Away from cognitivist, analytical rationality (rules, principles, and universal solutions) towards perceiving situations rapidly, intuitively, holistically, visually, bodily, relationally.	• The awareness of interpretation and judgment involved in such decision-making, rather than logical information processing and analytical problem solving only. • Deeply 'involved-in-the-world' manager/performer who already knows as he/she has evolved their understanding of the situation on the basis of prior actions and experience. • Reflective understanding and participation in power relations.	Intuitively understands and organizes the tasks in the local situation in the living present but continues to reflect analytically on what will happen as the emergent situation unfolds.
Expert or Virtuoso		• 'Emergent enquiry' – participative methodology of knowledge creation in context. • Intuitively, synchronously. • Participative critical reflection over the intuition – the self and the Group. • The thought, body, knowledge, and action are inseparable, are simultaneously forming and are being form by one another; thinking- doing. • Understanding that power relating is an intrinsic part of intersubjective relating, always there. • Considerations for the present and deliberation about the future.	Characterised by effortless performance at the level of virtuosity; No thinking/doing, decision/action, or plan/implement divide; Action based on logic replaced by experientially based action; intuitive and rational at the same time.

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