Reflective Piece

THE POWER OF REFLECTION IN IT PROJECT MANAGEMENT:
REFLECTIONS ON BRIDGING THE THEORY-PRACTICE GAP
FOR PRE-DEGREE STUDENTS

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INTRODUCTION

Pre-degree Information Technology (IT) students take a core course in Project Management as part of the New Zealand Certificate in IT Essentials, a staircasing pathway to degree studies at the Southern Institute of Technology (SIT) | Te Pūkenga. Project management skills form an essential component of the professional development of IT undergraduates, especially as they relate to compulsory, management-related papers in the Bachelor of Information Technology. This paper on project management essentials helps students navigate the basics of project management as it relates to IT projects by completing theoretical and practical assessments. The outcomes for this paper include the application of project management tools and methodologies, applying professional and ethical principles to comply with IT-related law, and developing communication skills.

Over the years, a significant body of knowledge has been developed and widely accepted as the Project Management Body of Knowledge (PMBOK) (Amaro & Domingues, 2022, p. 1878). It is common for topic material to be based on business contexts, with a natural focus on economics. In more recent years, with the establishment of IT across almost all sectors of modern life, the need for commercial software system projects to be prudently managed has become very important. Another leading methodology based on process management, particularly for IT projects, PRINCE2 (Project in Controlled Environments), is also a vital foundation for teaching IT project management. PRINCE2, like PMBOK, utilises time, quality and cost constraints (Pawar & Mahajan, 2017, p. 190). Software project management skills are useful in any area of IT and especially with the use of Agile methodologies, such as Scrum and Kanban (Kremer-Herman, 2022, p. 49). Scrum involves sprint review meetings where "the customer or stakeholder verifies the work and declares and distinguishes the completed and incomplete work or work that needs to be improved" (Bhattarai et al., 2020, p. 4). PRINCE2 also has a process which has some similarities to Scrum. "Manage Stage Boundaries is another process where board of the project makes review of all the work in various stages. In this process the stages are evaluated and recommendations are given either to go ahead or not" (Bhattarai et al., 2020, p. 3).

This reflective piece outlines the teaching of a lesson on IT project management, students' responses to the teaching session, teacher reflections on the constructivist approach, and the incorporation of the students' reflective elements within the context of a New Zealand Certificate in IT Essentials Project Management paper.

CONTEXT AND CONTENT

In the context of IT education at tertiary level, computational thinking includes several aspects that can be linked to project management. Doleck et al. (2017, p. 359) identify five computational thinking competencies: algorithmic thinking, cooperativity, creativity, critical thinking, and problem solving. Teaching IT project management with

an emphasis on generating IT solutions as an application of problem solving, the project management essentials course aims to make recognised project management content as relatable as possible, given the sometimes large-scale application examples used to illustrate it. The gap between project management content and the real aims and aspirations of IT students can make the subject seem relatively dry and irrelevant. Students who experience teaching and learning contexts from personal perspectives are likely to gain deeper appreciation of the interconnectedness between project management theory, according to PMBOK and PRINCE2, and their lives.

IT PROJECT MANAGEMENT LESSON

The session occurred on a weekday morning in the classroom with three students. The class comprised a small group of adults with varying prior knowledge of computing and use of information technology in business contexts. This was an opportunity to draw on the students' previous work and life experiences as we navigated our way through the course. For example, a student who had recent work experience in IT helpdesk support would have familiarity with the timeframes for helpdesk job resolutions, the time and financial constraints, the allocation of resources, and actions to be taken to meet stakeholders' expectations. In this way a prior understanding of the need for IT project management has already been developed. Mature learners would be returning to education after some years in the workforce and perhaps had never dealt with this topic in a tertiary academic context. The material was presented with a questioning approach from the beginning, to enhance student engagement and make theory and practice more logically and personally connected. Students more familiar with IT and building software solutions, often as part of computer gaming interests, would be acquainted with the set of tasks and processes needed to achieve their goals, within certain time and money constraints. These students might also have to revisit why one would need to know about IT project management. It is not uncommon for IT students to assume that they will mainly be computer programming, with perhaps a relatively small amount of time required for other subjects. Ivory et al. (2024) found that "broadly speaking, students are seen to hold misconceptions about soft skills, and typically prefer to prioritise technical knowledge acquisition over soft skill development, which is particularly evident for students with technical career aspirations" (p. 4). Agile methodologies such as Scrum involve Sprint Review and Sprint Retrospective, which can offer substantial reflective opportunities for the software development teams (Schwaber & Sutherland, 2020, pp. 9–10).

The kanohi-ki-te-kanohi (face-to-face) lesson commenced with a greeting: Tēnā koutou, tēnā koutou, tēnā koutou katoa (Welcome everybody). The learning goals and structure for the session were laid out on the whiteboard, the tutor ticking off each stage of this schedule as they were completed. The main parts of this lesson were arranged into four sections.

The first section involved asking the class: what is a project? In addition, the students were requested to spend a few minutes writing down some brief notes about an example of a personal 'project' from their everyday situations. After an appropriate timeframe for reflection, the students' verbal responses were shared, and this prepared the class for building on prior knowledge and making connections between the course theory and real life. The resulting perceptions, defined in their own terms, related well to an official definition of a project. The Project Management Institute (PMI) defines a project as "a temporary endeavor undertaken to create a unique products, services, or result" (2024, para. 1). The key phases of project management typically include initiating, planning, execution, monitoring and controlling, and closing (Roseke, 2017). These phases were then presented, and class discussion developed. Questions were raised about the need to distinguish between the various project management phases, which naturally led into the second part of the teaching session.

The second section involved the core learning activity for this lesson, which involved a mapping of the key project management phases to the student's personal project example. As discussion ensued, broad agreement was reached between the formal project management content and everyday life. Since the students' project

examples were drawn from their home and work lives, separating each part of the project management phases from each other proved challenging. Some students observed that the phases in small projects almost seemed to merge into each other, since their activity had been mentally pre-planned, and implementing this informal notion of a plan was all that mattered. Upon deeper and more deliberate reflection, the separation between the project management phases became more evident to the students, which was signalled as a relevant and very worthwhile activity. For certain individuals, this retrospective process produced those "aha" moments of clarity, thus reducing the perceptual distance between the course theory and their everyday lives. Valuing and drawing on students' existing knowledge, experience, and identity is a key principle in effective teaching (Ministry of Education, 2018). In addition, constructivist learning theory is based on the premise of building knowledge through joining new knowledge with what students already know (Bada & Olusegan, 2015, p. 66).

The third section of the lesson involved asking the students to take this initial reflective activity a step further, by starting to draw on the content and activities in the other papers of the course. This was a way of broadening their perceptions of projects and project management. One of the papers, Developing Computer Applications, focused on a software development life cycle and programming tasks. The second paper focused on Information Technology and Systems Essentials. This paper dealt with systems analysis, database and hardware skills. The session involved the tutor asking questions about what topics students were studying in their other IT essentials courses, and how these might relate to the key phases of project management. This initially proved somewhat challenging to the students. As they were provided with ample one-on-one time with the tutor, the connections between their life experiences, project management, and other topics started to develop. Working alongside each student evoked some very thoughtful reflections and responses, reducing the stress of trying to find or construct an example project to complete the class activity. In addition, this enhanced the student's appreciation of the qualification's unity, despite the range of topics taught by different tutors.

The fourth section focused on reviewing and summarising the key points of the lesson. This involved the tutor reviewing the main concepts and project management terminology presented. The students were invited to share their perspectives on how meaningful the session was, which aspects of the session were easier than they had expected, and which parts were more challenging than they had initially thought. Some final class discussion ensued with a recognition of the benefits of reflection in relation to IT project management skills instruction. Finally, as the lesson concluded, the students acknowledged the benefits of reflecting on the reflective process necessary for effective teaching sessions. Absalom and De Saint Léger (2011) identify the benefits of multi-level reflection in enhancing student engagement.

CONCLUSION

Institutes of technology focus on vocational education and training. IT courses and qualifications aim to develop technical and interpersonal skills for further study or employment. The facilitation of deep reflection in teaching and learning at SIT encourages students to challenge themselves and their often-hidden assumptions about the relevance and value of the topics they study, the concepts that are needed for a strong grasp of IT principles, and the dispositions that accompany them. This piece has outlined a constructivist teaching and learning approach with personal reflection foregrounded, and made reflections on various perspectives about the connections between project management and everyday life. The students gained added value of developed reflective skills to take with them on their academic or employment journeys. All of the small group of students graduated. Informal feedback from other tutors who teach the higher levels of IT project management within the Bachelor of IT can confirm that the students who took the project management essentials paper adapted more quickly to the more advanced papers than their peers who had direct admission into the degree. This course prepared its students for project management courses in undergraduate studies. Thus, the students could build on these foundations when navigating Agile methodologies and more advanced project management content. The students used the power of personal reflection on their work and life experiences to make meaningful connections between everyday projects and their IT project management course.

John Mumford is an IT Teacher at the Southern Institute of Technology, whose research interests include Teaching Innovation, Mathematics Education, Adult Literacy and Numeracy and Postgraduate Education. John has a Master of Adult Literacy and Numeracy and is dedicated to empowering learners to develop their critical thinking skills and dispositions.

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REFERENCES

Absalom, M., & De Saint Léger, D. (2011). Reflecting on reflection: Learner perceptions of diaries and blogs in tertiary language study. *Arts and Humanities in Higher Education, 10*(2), 189–211. https://doi.org/10.1177/1474022210389141

Amaro, F., & Domingues, L. (2023). PMBOK 6th meets 7th: How to link both guides in order to support project tailoring? *Procedia Computer Science, 219,* 1877–1884. https://doi.org/10.1016/j.procs.2023.01.486

Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education, 5*(6), 66–70.

Bhattarai, A., Neupane, S., Darlami, K., & Manandhar, A. (2020). Prince2 versus Scrum: A comparative study. *Journal of Recent Activities in Production, 5*(3), 1–7. https://matjournals.co.in/index.php/JoRAP/article/view/2283

Dolek, T., Bazelais, P., Lemay, D. J., Saxena, A., & Basnet, R. B. (2017). Algorithmic thinking, cooperativity, creativity, critical thinking, and problem solving: Exploring the relationship between computational thinking skills and academic performance. *Journal of Computers in Education, 4*(4), 355–369. https://doi.org/10.1007/s40692-017-0090-9

Ivory, M., Towse, J., Sturdee, M., Levine, M., & Nuseibeh, B. (2024). *Everything but programming; Investigating academics' perceptions of embedded soft skills in computer science undergraduate education.* PsyArXiv. https://osf.io/preprints/psyarxiv/y7guj

Kremer-Herman, N. (2022). Teaching software project management through roleplay via game development. *Journal of Computing Sciences in Colleges, 38*(1), 48–57.

Ministry of Education. (2018). *Effective educational resource development: Advice for providers.* https://www.education.govt.nz/assets/Documents/Ministry/Procurement/Effective-Educational-Resources-Information-Sheet-Mar-2018.pdf

Project Management Institute. (2024). *What is a project.* https://www.pmi.org/about/what-is-a-project

Roseke, B. (2017, March 20). *The PMBOK's five project phases.* Project Engineer. https://www.projectengineer.net/the-pmboks-five-project-phases/

Schwaber, K., & Sutherland, J. (2020). *The Scrum guide: The definitive guide to Scrum: The rules of the game.* https://scrumguides.org/scrum-guide.html