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Transitioning from passive to active learning: Preparing future project leaders

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ABSTRACT

Project management teaching and learning (PMTL) designed to develop future project leaders requires both knowledge acquisition and practical application to ensure that theory and practice converge with deep learning. Many higher education institutions are shifting from an instructivist delivery (lectures) to a constructivist approach (workshops). In attempts to maximize the students' engagement, performance and learning outcomes, their readiness to learn also needs to be considered. This mixed-methods research paper investigates students' perspectives of the impacts of a teaching and learning (T&L) transition in a project management program. Traditional delivery through lectures and tutorials, was replaced with flipped-blended learning through workshops. The study finds that the transition is generally well received. Engaged students are likely to perform well in a flipped workshop environment. However, scaffolding to prepare students for transition to flipped learning is key for driving knowledge gains, performance, engagement, collaboration and the overall positive learning experience.

1. Introduction

For almost two decades, educators have been advocating for transformative innovation in higher education that incorporates technology-based practices to cater to diverse student populations, changing global trends and emerging patterns of education that facilitate lifelong learning (Garrison and Kanuka, 2004; Alammary et al., 2014; Bonk and Graham, 2012; Fisher et al., 2018; Graham et al., 2013; Hilliard, 2015; López-Pérez et al., 2011). Students in higher education today are expected to be equipped for a competitive global transformation where the physical, digital and biological spheres are viewed as a blur due to the convergence of technologies (Forum, 2016, 2020; Schwab and Schwab, 2017). The size, speed and scope of these changes are historically unprecedented. The significant increase in uncertainty, unpredictability and volatility due to the recent Covid-19 pandemic and associated technological innovations present fresh opportunities to be leveraged to build leaders of tomorrow (Forum, 2020). Key skills now identified as prominent by global business leaders include '*critical thinking and analysis as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility*' (Forum, 2020) (p. 5). These skills are further classified as skills and knowledge (e.g. business skills, innovation and creativity, digital and industry-specialised); attitudes (e.g. interpersonal); physical (e.g. acquisition and application of knowledge in problem-solving) and cognitive abilities (e.g. core literacies) (Forum, 2020).

More than ever before, educators in project management teaching and learning (PMTL), leveraging these macro-opportunities to enable future project leadership, will require pedagogical designs that encompass convergent T&L delivery approaches to integrate knowledge acquisition and application to ensure that theory and practice converge with deep learning. In theory, there are two broad pedagogical worldviews underpinning the choice of delivery models of teaching and learning (T&L) in higher education. The first is the instructivist perspective where T&L is 'instructor-led' and controlled. A typical delivery mode would be the lecture, where the instructor, as a lecturer, disseminates knowledge and content to the students. Student interactions with their peers and instructor tend to be minimal. The second is the constructivist worldview. It is more 'student-centered', where learning is constructed through conversation, interaction and collaboration between the students, their peers and the teacher as facilitator.

It has been suggested that the application of knowledge should be the focus in higher education courses (Pluta et al., 2013). By increasing

Abbreviations: T&L, (Teaching and Learning); FTF, (Face to Face); PMTL, (Project Management Teaching and Learning); LMS, (Learning Management System).

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student interaction and collaborative learning, research has shown that active learning and therefore knowledge retention can be improved (Hake, 1999; Roehl et al., 2013; Novak, 2002). The challenge educators often face is how the knowledge is acquired by students, where the opportunities lie for students to apply the knowledge, and how it can be retained. Blended learning, at its simplest, combines the traditional face-to-face (FTF) teaching methods with online learning experiences (Alammary et al., 2014; Bonk and Graham, 2012; Graham et al., 2013; Driscoll, 2002; Ramakrisnan et al., 2012; Vaughan, 2007). Meanwhile, delivery modes are the ways in which teaching is executed, for instance, through lectures and tutorials that are delivered either weekly over a semester, or blocks over a short intensive period of time. These are typically delivered synchronously FTF on-campus or in a virtual online environment that could be synchronous or asynchronous. Another alternative to lectures and tutorials is through workshops which focus on application of knowledge. Finding the right mix or integration for blended learning arrangements and delivery modes can be a challenge (Garrison and Kanuka, 2004; Kerres and Witt, 2003) and requires a reconceptualization and reorganization of the T&L dynamic (Garrison and Kanuka, 2004). Garrison and Kanuka (2004) add that the educational experience of blended learning requires teaching, social and cognitive presence rooted in dialogue for critical thinking and higher-order learning. In this stream of thought, students need to be able to assimilate the knowledge gained, construct meaning and confirm their understanding.

1.1. Context of this study

Up till 2019, undergraduate (UG) and postgraduate (PG) subjects in a project management program at one of Australia's leading universities (Codenamed Go8Sandstone) were delivered through a blend of online instructions and resources, and on-campus teaching. The concept of flipped learning was also strongly encouraged in the program.

The blended and flipped learning approach applied in Go8Sandstone subjects comprised a suite of online learning resources and tasks that students were encouraged to engage with before the FTF sessions. These flipped-blended sessions were delivered through lectures and tutorials. Lectures for the subjects were predominantly 'teacher-led', instructional, and focused on disseminating knowledge. Associated tutorials were tutor-led, including discussions and hands-on student activities that emphasized the application of the knowledge.

Students at Go8Sandstone have various expectations of how they will be taught. Many of the students have been observed to demonstrate a passive learning style that is assumed to result from being exposed to past teaching styles that are mainly instructional and lecture-based, or, for other students of Asian backgrounds, this style is said to stem from their Confucian heritage culture and values (Tran, 2013). The latter are said to be reserved, unquestioning and non-participatory, potentially because questions, debate and active participation may be deemed rude or unacceptable in their cultures. However, this observation about students' behaviors could also be due to situation-specific factors such as the students' learning environment and requirements, learning habits and language proficiency rather than cultural factors (Tran, 2013).

Furthermore, the majority of students enrolled in the programs of Go8Sandstone are of the current millennial generation (born after 1980) and said to demonstrate lower tolerance for course information disseminated in a lecture-styled format. They expect the use of technologies that deliver 24/7 information connectedness, multi-tasking, groupwork and social aspects of learning in their learning environments (Roehl et al., 2013).

While blended learning technologies have under-pinned the teaching and learning for Go8Sandstone in the last decade, 2019 marked a structural change to the program delivery. Specifically, a deliberate decision was made, across the program, to transition from traditional lectures and tutorials totaling 3 h, to a structure that delivers FTF learning through consistent teacher-led 2-h workshops for each group of up to fifty students. While the actual FTF time is seemingly reduced by 30 per cent, in actuality, the new design has increased the opportunities for teacher-student interaction and engagement towards a more constructivistic model of delivery. Class sizes and the teacher-student ratios were considerably reduced as part of the new workshop approach. The move from lectures and tutorials to condensed weekly workshop formats required more self-directed learning, active participation and engagement. The change to workshop formats offered potential to be empowering for students and serve as an efficient use of FTF class time.

Overall, the transition effected a shift in delivery from the standard traditional on-campus lecture and tutorial-based sessions to on-campus and/or online workshops, supported by the increased use of online technologies for a blended learning environment. However, it was recognized that the use of workshops for interactive discussions and application could also be a source of stress and anxiety for students who prefer or are used to the traditional instructional and learning formats.

There have been many key studies about student experiences in blended and flipped learning (Fisher et al., 2018; Roehl et al., 2013; Brewer and Movahedazarhouligh, 2018; Gündüz and Akkoyunlu, 2019), technologies suited to a blended environment, and the calls to move from the pedagogical perspectives of the instructivist (lecture based/teacher led) to the constructivist (student-directed) modes of teaching and learning (Beck and Kosnik, 2006; Brooks and Brooks, 1993; Jonassen, 2003). However, research studies linking these delivery modes and pedagogical perspectives with students' ability to gain knowledge, engage and perform for an overall positive learning experience are still limited. This research was designed to answer the following questions:

1. What are students' perceptions of their learning experiences about flipped-blended learning with workshops that focus on discussions, knowledge application and problem-solving or experiential activities?
2. How has this differed from having flipped-blended learning in lectures and tutorials?

This research is significant because firstly, the transition from lectures and tutorials to condensed weekly blended workshop formats expects more self-directed learning, active participation and engagement in the classroom, befitting project managers and leaders navigating through complexity and uncertainty. This has the potential to be empowering for students, but it could also be a source of stress and anxiety for students who are unused to these contemporary approaches. The relational shift in the teacher-student dynamics where it is now 'teacher as workshop facilitator' and 'student as active participant' (formerly 'teacher-tutor as instructor-tutor' and 'student as passive learner/tutorial participant') might be different.

Impact of different delivery models on students' learning experiences have yet to be explored in-depth. Studies about these challenges in transition within project management in higher education are scarce.

There are a handful of studies reporting project management students' hands-on experiences of blended and flipped learning that focus on discussions, knowledge application and problem-solving or experiential activities (Mengel, 2008; Ingason and Gudmundsson, 2018). This research is significant as it will contribute to the body of knowledge of blended and flipped learning particularly for project management studies in higher education. It will also provide flexible and open guiding principles for project management educators interested in blended and flipped learning methods that could potentially empower and engage students through flexible pedagogical mechanisms that combine technologies with thoughtful delivery in an era that is volatile, uncertain, complex and ambiguous.

2. Literature review

2.1. Theories of learning

Different learning theories emphasize various components in the learning environment. Activity theory, for example, highlights the core mechanisms of learning as an inter-relationship between conscious learning and activity, meaning that learning necessitates acting on some entity (Kerres and Witt, 2003; Margaryan et al., 2004). Constructivist theories tend to focus on learning constructs through conversation and collaboration based on the interchange of knowledge between learners in their own contexts and community (Kerres and Witt, 2003; Bentley et al., 2000; Brooks and Brooks, 1999; Brown and Adams, 2001; Fosnot, 1989; Gagnon and Collay, 2001). In many institutions of higher learning, the trend has been to move from instructivist modes of teaching (lecture-mode) to a more student-centered active learning where the student is expected to construct their own knowledge (Beck and Kosnik, 2006; Lueddeke, 1999).

Formal learning in higher education today needs to take into account the links between theory and practice, and the engagement of the learner with educators and their peers. Learning is both individual and social. Furthermore, students have different learning styles and approaches to knowledge. Lage, Platt and Treglia (Lage et al., 2000) reference the Grasha-Reichmann learning styles that categorise students as dependent, collaborative or independent learners; the Keirsey-Bates categorization of learning styles that is based on the Myers-Briggs Type Indicator; and Kolb (1976) and Honey and Mumford (1992) learning styles and cycles that highlight the differences in ways that students acquire and process information. From this, they imply that instructors need to consider alternatives to the traditional lecture to maximize the opportunities for students to draw upon their own unique ways of learning, and provide different avenues for acquiring and demonstrating their understanding.

2.2. Blended learning

Blended learning (or hybrid learning) is well-known as a convergent style that combines and integrates various kinds of FTF learning methods or learning experiences with online or technology-mediated instruction (Alammary et al., 2014; Graham et al., 2013; Vaughan, 2007; Bonk et al., 2005; Wang et al., 2015). The incorporation of digital technologies into T&L resides in a continuum between fully online and fully face-to-face. The use of technology in T&L can be said to enrich the connections between knowledge and process; learners, their peers and the teacher; and makes learning more flexible and reusable (Margaryan et al., 2004; Collis and Margaryan, 2005). It is also implied that FTF learning that accompanies internet-based T&L ensures the quality of learning, and reduces dropouts that might occur when T&L is conducted in the online space (Kerres and Witt, 2003). Digital technologies today fit well with the attributes of social-constructivist, active learning, provided they optimize on being interactive, communicative and user-centric (Laurillard, 2013).

Despite the inherent advantages of blended learning, in practice, some argue that finding the right design and mix for a blended learning arrangement, and how its constituting elements work together with the different types of delivery, can be a challenge (Kerres and Witt, 2003; Wang et al., 2015; Laurillard, 2013). Kerres and De Witt (Kerres and Witt, 2003) suggest that blended learning arrangements need to consider the various learning components like learning materials (content), interpersonal learner-to-learner or teacher-learner interactions (communication) and learning activities at the individual and group levels with different degrees of complexity (construction). To support learners in achieving their learning objectives, it is necessary to combine '*content*', '*communication*', '*construction*' (Kerres and Witt, 2003) (p.104), although not all blended learning arrangements might require all the elements (Laurillard, 2013). Furthermore, there are choices about how these components are delivered, for instance, how FTF combines with online and multi-media digital platforms in asynchronous or synchronous settings. Preferred philosophies of teaching and learning (T&L) such as activity-based learning, the constructivist approach, or learner-centered principles may not always address the question of which components to include, when, how or in what quantities. The Conversational Framework by Laurillard (2013) integrates multiple learning theories in a teaching design for students that incorporates a range of different technologies and methods: Acquisition, Inquiry, Practice, Production, Discussion, Collaboration.

These evolving views represent an eclectic mix of learning philosophies drawn from Bandura, Dewey, Knowles, Mezirow, Piaget, Vygotsky and many other pedagogical scholars. Blended learning can operate in an adaptive, dynamic, self-organizing, co-evolving complex system that seamlessly fuses live learning with technology-mediated learning (Wang et al., 2015). This is not dissimilar to the project management environment. The question still remains '*How is this transition impacting the project management students' experience'* and *'How can educators optimize the blended learning experience for project management students'*?

2.3. Blended learning and the flipped classroom

Flipped classes are where students are expected to prepare at home before attending a class (Roehl et al., 2013; Brewer and Movahedazarhouligh, 2018; Seery, 2015) regardless of whether they attend a lecture, tutorial or a workshop. It takes what was traditionally teacher-led instructions or class content and replaces it with what was previously homework or activities assigned to students to complete (Roehl et al., 2013; Seery, 2015; Yeung, 2014; Pierce and Fox, 2012; Fisher et al., 2020). Increasingly, flipped learning is viewed as a form of blended learning as it combines teaching modalities including digital technologies (Garrison and Kanuka, 2004) to transfer direct instruction of students from the group into the individual learning space (Yarbro et al., 2016).

This approach has been demonstrated to be a relevant T&L strategy for project management as it affords increased student freedom, flexibility and individualized learning (Ingason and Gudmundsson, 2018). This is particularly relevant for students of the millennial generation (Roehl et al., 2013).

In a flipped learning environment, as homework, students typically prepare and acquire content and knowledge via pre-recorded lectures, prescribed texts or readings, videos, simulations and case studies prior to attending class. Students nowadays can access prerecorded multimedia lectures at their own pace (Roehl et al., 2013; Lage et al., 2000). They may access the content via a learning management system (LMS) such as Moodle, Blackboard or Canvas. Then, students attend class for interactive engagement, just-in-time teaching and peer collaboration. In this way, students build upon their previously acquired knowledge through various in-class interactive elements such as presentations, discussions, role plays and debates (Lage et al., 2000; Sohrabi and Iraj, 2016; O'Flaherty and Phillips, 2015).

According to Laurillard (2013), students engage in formal learning to grasp the experts' view of the world, but this is different from how one might learn about the world for themselves. In the discipline of project management, topic areas such as leadership, teamwork, stakeholder facilitation and engagement, or conflict management are categorized as 'soft skills' that require students to apply their knowledge in order to become proficient project or team leaders. Grasping an expert's view and acquiring knowledge is not synonymous with learning actively through other means.

Flipped learning further divides learning into lower and higher order learning objectives. Lower order learning such as remembering and understanding can be achieved through preparation before class. Higher order learning such as analysis and evaluation can be better accomplished with interaction with others in the classroom, with peers and the teacher (Fisher et al., 2018). As with any other T&L approaches, flipped

learning is premised on the learner's contributions and efforts (Ingason and Gudmundsson, 2018; Fisher et al., 2020) but there is also a risk of learners being left behind in a course, if students are unable to engage with the process.

Flipped learning expects a high level of learner autonomy and self-regulation. One of the challenges of flipping a class is the expectation that students are able to complete the preparatory work before class time. This is an increasingly acknowledged problem (Fisher et al., 2018, 2020), as the reality is that, not all students are able to cope with or embrace this type of learning environment without scaffolding (Fisher et al., 2020). In agreement with Fisher, LaFarriere and Rixon (Fisher et al., 2020) state that blended-flipped environments require the other notions of student agency, ownership and attitudes surrounding knowledge acquisition and self-directed learning, teacher autonomy and planning in order to scaffold the student's learning and optimize their engagement and learning experiences.

According to Fisher (Fisher et al., 2018, 2020), student engagement is a multidimensional construct. The various dimensions of engagement are nurtured by the students' enthusiasm, interest, belonging, self-regulation, time and effort placed on studies, interaction and participation. It is further characterized by the student's feelings of autonomy and choice of control (Wang et al., 2015). The risks with flipped requirements for engagement are that students might not engage with the asynchronous learning materials. Consequently, while in class, students may or may not engage with the session, educators or their peers. Laurillard's framework (Laurillard, 2013) places learning through discussion and collaboration in this category, whereby engagement stimulus could be in the form of a role-play, debate, case study, question, problem or scenario for students to respond and generate further ideas and questions. These could be through synchronous groupwork in class, group projects outside of class and asynchronous online discussion boards.

Another approach to achieving student engagement is learning through production (Laurillard, 2013), whereby learners are encouraged to consolidate and articulate their learning by producing a learning artefact such as an essay, presentation, video blog or report. Other approaches encourage students to participate in interactive online discussion boards, as an opportunity for students to consolidate and articulate what they have learnt. This way, educators can gauge the learner's articulation of their current thinking and provide guidance, further explanation and formative or summative feedback.

In this paper, we extend the exploration of blended learning whereby contemporary blended learning is not necessarily limited to FTF classes, but represents integrated learning that combines any type of live synchronous learning events (FTF or online in a synchronous manner) that are complemented by knowledge or content disseminated through digital technologies (usually online) in asynchronous self-directed learning. In particular, this paper explores the relationships between knowledge gained, student engagement, performance and the overall learning experience of students in the flipped workshop environment. This study provides further insights about these relationships through in-depth qualitative student perspectives about their learning experiences. Demonstrating the link between flipped and blended learning and positive learning outcomes in project management education is important as it will firstly, add to our knowledge about the effectiveness of promising pedagogies in a digital environment, and secondly, prepare students as future project leaders that are confident in traversing the digitally complex and social world of knowledge, communication and collaboration with their peers and stakeholders.

3. Hypothesis development and prepositions

Blended learning approaches can support meaningful and transformative learning outcomes, and facilitate critical, creative and complex thinking skills (Garrison and Kanuka, 2004). Student's engagement with online material is considered as an essential element of successful flipped and blended learning. This engagement is linked to knowledge gain and performance (Fisher et al., 2018; Jovanović et al., 2017). Fisher et al. (2018) define student's performance as the extent to which they gain and apply the knowledge and skills to achieve the subject's learning outcomes, one indication of which is grades achieved. Many studies suggest that students' performance is related to their learning experience (Fisher et al., 2018; Douglas et al., 2015). Learning experience is generally understood to be the extent to which students have enjoyed their studies (Fisher et al., 2018). Based on the preceding literature, the following model (Fig. 1) and hypotheses were formulated:

H1. Flipped blended learning has a positive influence on students' learning experience;

H2. Engagement with online material has a positive impact on students' knowledge gain and performance;

H3. Knowledge gain has a positive impact on students' performance and overall learning experience;

H4. Performance has a positive impact on students' overall learning experience.

The workshop format allows students to interact in meaningful learning activities with educators and their peers. In addition to the above hypotheses, this mixed-methods paper presented the following propositions that support student preparation, engagement, collaboration and scaffolding: P1, P2, P3 and P4. The first proposition (P1) suggested that self-management and student responsibility require a shift of mindsets from passive to active learning, and from dependent to independent learning.

P1: Preparation before class requires a shift in mindsets towards self-management and responsibility.

Flipped learning environments place more responsibility on the student to prepare their studies before attending class (Lage et al., 2000; Fisher et al., 2020). The limitation with flipped learning is in its underlying premise that students will engage with learning materials before class (Fisher et al., 2020). This brought us to our second proposition (P2):

P2: To support a student's knowledge gains, performance and ultimately a positive learning experience, student engagement needs to be flexible, multidimensional and dynamic.

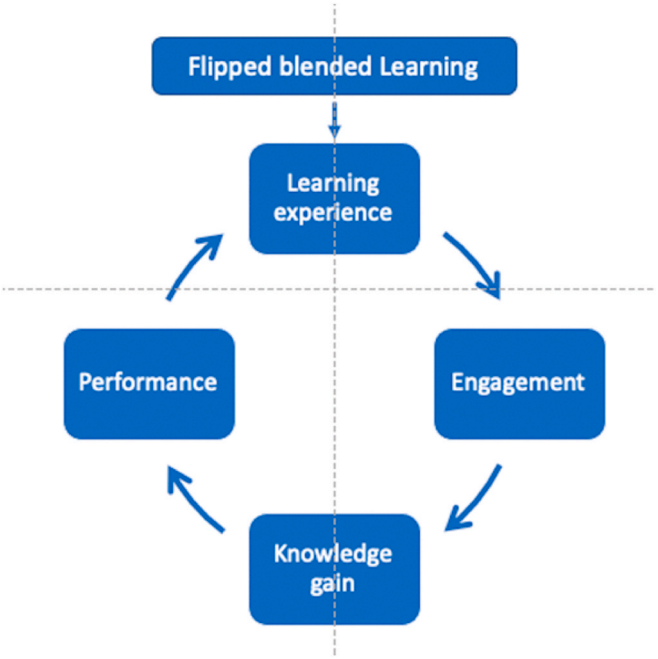

Fig. 1. Learning model and research hypotheses.

The shift from lectures as the dominant delivery modes to other modes such as workshops favors a variety of facilitated learning activities and tasks that are more active, interactive and meaningful (Garrison and Kanuka, 2004). The T&L blended and flipped design needs to cater to a wide range of student learning styles to increase student performance, diversity and interest in the subject area being taught. Variation in teaching methods is likely to actively engage different types of students' learning styles (Lage et al., 2000; O'Flaherty and Phillips, 2015). Students gain and expand on their knowledge through engaging with content in various forms of flipped and blended learning that include a range of components such as pre-readings, videos, online discussions, simulations, multimedia lessons, assignments, projects, quizzes and digital content that appeal to the dependent, collaborative or independent learner (Lage et al., 2000). Students' performance can be tied to formative and summative assessments, or formal T&L interactions to gauge if the learning outcomes have been achieved. This lead us to the third proposition:

P3: Collaboration with peers motivates and engages students in social learning.

Collaboration fosters learning through peer discussion, practice and production where knowledge and ideas are exchanged and joint and shareable outputs are produced (Laurillard, 2013). We argue that collaboration is likely to motivate and engage students to learn socially and embed their knowledge into practice since it incorporates several learning methods like discussion, practice, production, and possibly inquiry. This brought us to the fourth proposition (P4):

P4: Scaffolding in 'learning to learn' is needed to facilitate the transition for students to move into a flipped learning environment.

Finally, for flipped learning to work, students need to be self-directed and prepare before class. The problem is that not all students may be ready or prepared for a flipped learning environment (Fisher et al., 2018, 2020), particularly if they have been used to the traditional modes of learning, or if they are a dependent learner requiring more instruction and direction from their educators (Lage et al., 2000). In actuality, not all students are able to embrace this type of learning environment without scaffolding (Fisher et al., 2020). A scaffolded acceptance of responsibility and 'learning to learn' is needed to support students with knowledge acquisition, meaning construction and understanding (Garrison and Kanuka, 2004).

4. Research design and methodology

The study used a mixed-methods approach (Creswell, 2014) in a concurrent design structure that combined primary research using quantitative online surveys with qualitative semi-structured interviews. The use of mixed methods was considered appropriate for this research as more meaningful results could be achieved by mixing methods in a way that their strengths are complementary and their weaknesses do not overlap (Creswell, 2014; Howe, 2012; Tashakkori and Teddlie, 1998). It enabled the researchers to better understand the relationships between complex mechanisms and gave insights into the way that students learn and perform in different learning environments.

The quantitative online survey was administered to students enrolled in one or more of six selected subjects within a semester. In completing the survey, the students were asked to focus on only one subject.

The overarching research questions were shared across the two methods, but the manner in which the research questions were translated into each instrument varied. The two methods were mixed in this study but each retained their distinctive roles (Howe, 2012). The sampling procedures, data collection procedures and types of data collected were different. The data analysis was conducted independently, and then triangulated (Bryman et al., 2003; Fielding, 2012) and integrated to present a pragmatic worldview of the findings. The pragmatist view emphasizes inferences that are drawn using both the qualitative and quantitative approach to provide multiple philosophical perspectives or worldviews (Creswell, 2014; Tashakkori and Teddlie, 1998). In this paper, the data from different sources was integrated and triangulated to identify divergent and convergent elements in the study, adding analytical density and richness (Fielding, 2012).

4.1. Data collection and sample profile

Six teaching 'units of study' or 'subjects' from the undergraduate and postgraduate programs at the Go8Sandstone were selected to compare and contrast the student perspectives of their learning experiences, Specifically, we investigated the online content in the blended learning environment that supported or facilitated their knowledge acquisition and learning; student attitudes and approaches to learning in the different delivery modes; and how this might have impacted on their perceptions and performance.

The six subjects identified for this study were deliberately different with the intention to consider a wide variety of teaching and delivery approaches that educators can draw upon to optimize the students' engagement and learning experiences in a blended learning context. The selection comprised three subjects from the undergraduate (UG) program, and three from the postgraduate (PG) program. The subjects were selected to ensure a spread across different stages of a student's overall learning program ranging from their first to their final semester of study. Finally, the subjects were also selected based on whether they were considered a hard or soft project management (PM) subject. Hard skills are characterized as technical or process-driven skills, while soft skills tend to be described as interpersonal or relational skills. The sample profile is summarized in Table 1.

An invitation was sent to 1007 students enrolled in selected postgraduate and undergraduate units in the school of project management to participate in the online survey. Of the 1007, 316 completed the survey, a response rate of 31.4 percent. After the initial scrutiny 252 responses (175 PG; 77 UG) were used for analysis.

A questionnaire survey was conducted with the students towards the end of the second semester in 2019 to assess the effectiveness of the flipped workshop learning model. The questionnaire contained three sections. The first section collected the demographic details of the students. Then, the student's preference for different delivery modes was investigated. The next section had questions to evaluate students' attitude towards pre-class learning and effective online elements of the pre-class and post class activities. The third section evaluated students' performance; knowledge gained and overall learning experience. Students were asked to rate their knowledge gained, performance, engagement and learning experience on a five-point Likert scale. Knowledge gained was evaluated as: gained a lot less knowledge, gained less knowledge, gained the same knowledge, gained more knowledge and gained a lot more knowledge. Engagement with online elements was evaluated as: very disengaging, disengaging, neither engaging nor

Table 1
Mixed-methods sample profile.

Subjects	Program level	PM Skill type	Stage	Quantitative Sample n = 252	Qualitative Sample n = 6
UG1	UG	Hard	1st year	30	N = 6 enrolled across a mix of these subjects
UG2	UG	Soft	2nd - 3rd year	28	
UG3	UG	Soft	2nd - 3rd year	30	
PG1	PG	Soft	2nd year (3rd semester)	47	
PG2	PG	Hard	1st year (2nd semester)	124	
PG3	PG	Hard	1st year (1st semester)	4	

disengaging, engaging, very engaging. Performance was evaluated as: I performed much worse, I performed worse, I performed the same, I performed better, I performed much better. Learning experience was measured by the extent to which students agreed that the combination of online materials with workshops improved their learning experience, and evaluated as: strongly disagree, disagree, neither agree nor disagree, agree and strongly agree. For the purpose of further analysis numerical points were given to these ratings (SA = 5, A = 4, N = 3, D = 2, SD = 1). Subsequently, the mean scores were computed using the formula:

Mean Rating = [(Fraction of responses for SA x 5) + (Fraction of responses for A x 4) + (Fraction of responses for N x 3) + (Fraction of responses for D x 2) + (Fraction of responses for SD x 1)].

A summary of the key survey questions is outlined as follows:

- *Preference*
  - o I prefer the blended format of 'lectures and tutorials + online materials'
  - o I prefer the blended format of 'face to face workshops + online materials'
- *Preparedness*
  - o I tend to look through the online materials beforehand, prior to participating in the weekly sessions
  - o I tend to attend the weekly sessions, and then look through the online materials after that
  - o I tend to just attend the live sessions only
- *Elements of online learning*
  - o Module Videos (embedded or links)
    Module Readings (PDF or links)
  - o Discussion boards – assessed
  - o Discussion boards – not assessed
  - o Links leading to social media (Twitter, Instagram or others)
- *Knowledge gained*
  - o How much knowledge have you gained through this new approach?
- *Performance*
  - o How well do you think you performed this semester?
- *Learning experience*
  - o The combination of online materials with workshops has improved my learning experience in this subject

In addition to frequency counts, means, and correlations, structural equation modelling technique (PLS- SEM) was used to analyze the quantitative data using Smart PLS. Several guidelines were adopted from Hair et al. (2016) to confirm item reliability and construct validity:

(i) Factor loading must be above 0.6;
(ii) Cronbach's alpha coefficient must be above 0.7;
(iii) Composite reliability score must be at least 0.70;
(iv) Average variance extracted (AVE) value must be at least 0.50 and the square-rooted AVE scores of respective pair of constructs must be greater than their correlation coefficients;
(v) The AVE value of respective construct must be greater than its Maximum Shared Squared Variance (MSV) Average Shared Square Variance (ASV) values; and
(vi) The Heterotrait–Monotrait ratio of Correlation (i.e. HTMT) value should be below 0.90. Following the above process, a structural model was developed to test the hypothesized relationships and its explanatory power was assessed by examining the amount of variance (R^2) accounted for by the independent variable on each dependent variable. Bootstrapping process of 5000 samples in Smart PLS was used to determine the statistical significance of the path coefficients (t-statistics).

Subsequently, the structural model evaluation this study adopted four guidelines by Hair et al. (2016):

(i) an independent variable must explain at least 15 percent of the variance in a dependent variable; otherwise the independent variable will be removed and model will be re-assessed;
(ii) a dependent variables' R^2 value of 0.75, 0.50, and 0.25 will be considered as substantial, moderate, and weak, respectively;
(iii) an independent variable's tolerance (VIF) value should be at least 0.20 (or lower than 0.5); and
(iv) independent variables' f^2 value of 0.02, 0.15, and 0.35 will correspondingly indicate small, medium, or large effect on a predictor construct

For the qualitative data collection, students who completed the survey were asked to indicate their interest to participate in an interview. Those students who opted to be interviewed clicked on a link that transferred them to a separate site where they entered their contact details. This way, the anonymity of the students is maintained and cannot be linked to the students' survey details. Each semi-structured interview was between 45 and 60 min long. The interview themes, questions and propositions addressed (P1–P4) are summarized as follows:

- *Learning expectations and learning experiences (P1, P4)*
  - o Thinking about your learning environment this semester, what did you notice that is different from your expectations this round (if at all)?
  - o How has this process impacted on your expectations and overall learning experience?
  - o What are some of the challenges you faced with the blended and flipped learning approach this semester?
- *Performance (P1, P2, P3)*
  - o How do you think you went this round (performance)?
  - o What worked really well this semester?
  - o What could be different or needs to be improved?
- *Learning approach or process/Knowledge gained (P3, P4)*
  - o Can you describe how you learnt this semester? How did you access your knowledge?
  - o How did you then develop your understanding of the subject?
  - o What would you suggest for future students?
- *Engagement with online materials (P2)*
  - o Can you let me know which parts worked well and which sections need to be improved?

These interviews were digitally audio-recorded as raw data, and then professionally transcribed. Subject content analysis, field notes and researchers' observations were systematically recorded into MS Word and Excel documents. The individual data sources were de-identified and replaced with codenames.

The qualitative data was thematically coded and analyzed deductively and inductively (Bazeley and Jackson, 2013) using NVivo 12, a computer aided qualitative data analysis software (CAQDAS). Themes and sub-themes were then integrated with the quantitative findings.

5. Results and discussion

5.1. Effectiveness of workshop learning model

Overall a high majority of students (75.6 per cent) agreed or strongly agreed that the workshop model enhanced their learning experience (mean = 4.23, SD = 1.01). A *t*-test showed a statistically significant difference between the flipped classroom and the traditional teaching approach ($P < 0.000$). Students indicated that they gained more knowledge (mean = 4.56, SD = 0.58) and performed better (mean = 3.74, SD = 0.96) in the workshop model compared to the lecture and tutorial model. However, it should be noted that Postgraduate students tended to prefer workshops over traditional teaching more than undergraduate students ($P < 0.001$). In response to the qualitative question

"What do you think of the changes from lecture and tutorials to workshops?" students mentioned that workshops were more effective for students' learning. The positive cues evident in the qualitative data included 'definitely like', 'good experience', 'satisfying', 'do many things', 'acquire resources I want', and 'remember much better', as quoted below:

- *"I would say I definitely like this approach of delivering, it's a good experience"* (2nd semester PG3)
- *"It is very satisfying, yes, because I could do many things, and I could acquire some resource I want"* (1st semester PG2)
- *"If you come to the lecture, first of all, the time is too long. And there's lots of information knowledge. Perhaps after the lecture you will forget. Usually in the tutorial, the teacher will not go through the knowledge from the lectures. Sometimes I can't understand what the teachers say. But if you do the activities after the teacher taught the knowledge [referring to the workshop format], you will remember much better."* (2nd semester UG3)

The results of path analysis of the structural models are summarized in Table 2.

From Table 2, the results indicated that a well-developed flipped learning model explains a significant variance in the overall learning experience (R^2 = 0.592; β = 0.77, P = 0.00). However, it is worth mentioning that effectiveness of the workshop teaching model depends on the overall course structure and how well the academic had flexibly scaffolded the learning activities. For example, on one hand, a student from PG2 indicated, "*The good thing is the pre-study before attending to the workshop, because I read and I watch the video beforehand, and that allows me to have time to think and reflect, and then directly attending a workshop. I think it's more time efficient rather than the teacher giving you the information and knowledge and then the student needs the time to receive and then think. But at home or when I'm on the bus or train, I can think before attending the workshop, and after the workshop I can interact with our teaching team and my peers directly sharing my thoughts and also hearing the reflection and the feedback from others as well.*" On the other hand, a student from a poorly structured course indicated "*To be honest I struggled to learn in the subject. I found it a little difficult to learn from the lecturer particularly because there was a disconnect in the reading material and in-class activities*" (UG1). This finding supported Fisher, LaFerriere and Rixon (Fisher et al., 2020) who suggested that blended flipped environments require scaffolding to optimize student's engagement and learning experience. Furthermore, learning resources and activities need to be well-linked to have a positive impact on the overall learning experiences.

Fig. 2 shows the impact of students' engagement with online self-learning activities on their knowledge gained and performance. Table 2 indicates that online engagement explained 17.8 per cent of variance (R^2 = 0.178; β = 0.422, P = 0.00) in knowledge gained. Further, online engagement and knowledge gained were found to explain 31.4 per cent variance in students' performance (significant at p = 0.00). Students' active engagement with learning resources and its association with their performance was also confirmed in a study by Jovanovic (Jovanović et al., 2017). Table 2 highlighted that knowledge

Table 2
Relational pathways for the hypotheses.

Hypothesis	Proposed path	Path coefficient (β)	R^2	f^2	Inference
H1	FBL-LE	0.770[a]	0.592		S
H2a	OE-KG	0.628[a]	0.178	0.217	S
H3a	OE-P	0.422[a]	0.314	0.059	S
H3b	KG-P	0.432[a]		0.22	S
H4a	KG-LE	0.330[a]	0.248	0.105	S
H4b	P-LE	0.238[a]		0.055	S

[a] Indicate P < 0.00.

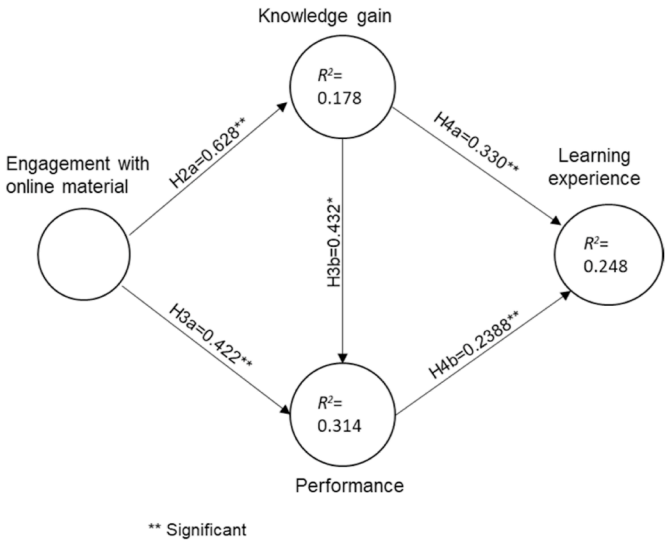

Fig. 2. Impact of student online engagement (OE) on knowledge gained (KG), performance (P) and learning experience (LE).

gained and performance explained 25 per cent variance in the overall learning experience. However, the unfamiliarity of students with this model might cause some challenges. One respondent *indicated "Actually, in the first two weeks, I didn't get much ready for it since I wasn't used to such kinds of learning processes or some learning methods. But since I got used to it, I could say, I'm ready for it."* (PG1, Semester 1). In the early weeks of preparation, it can be said that students have an increased cognitive burden (Jovanović et al., 2017) as they simultaneously adopt the new learning approach as well as work on the subject requirements for their knowledge and skills.

Findings indicated that students need more support about 'learning to learn' in a flipped-blended environment, particularly in the first few weeks of commencing the subject. *"I would say, a heads up during the introduction session on the first week or second week, that will be great because some students - they didn't know this change.*' (2nd semester PG), and "*give more details or explanation about how this learning process is delivered will be very necessary*" (1st semester PG). The findings confirmed our proposition (P4) that scaffolding in terms of helping students 'learn to learn' would be helpful in facilitating the transition for students to move into a flipped learning environment. We would add that scaffolding the learning process is needed to set students up early from the onset of them commencing their studies.

Another important finding of this study is that students in workshops were more willing to work together and participate in the group activities than the traditional classroom. One student indicated that, *"The most valuable thing is the team discussion or dynamic, because individuals have different understanding of the topic or a certain knowledge. Sometimes, it can be biased so I would like to have an open conversation with my peers to see, oh, what's something I missed or also, maybe I can see maybe someone misunderstood on something."* (2nd semester PG2). This learning environment provided students opportunities to improve their non-technical skills that are crucial to project management. Educators can facilitate the students' ability to grasp knowledge by creating social learning activities where tacit student knowledge can be explicitly shared with others, and educators can then provide timely feedback, modifications and guidance to the knowledge attained, and facilitate further application and practice. Laurillard (2013) attributes this sequence as a mix in practice and communication. Students are encouraged to produce and share outputs of their learning, discuss, debate or present, critique, offer ideas and questions, as to make the students' thinking visible to their peers and educators. A workshop environment provides the learning space for students to build these types of external representations of

their knowledge and share it with their peers, and confirms the proposition (P3), that *collaboration with peers motivates and engages students in social learning.*

5.2. Pre-class learning

The effectiveness of flipped learning is dependent on the student's pre-class preparation. When asked about their pre-class preparation, 78 per cent agreed that they tend to look through the online material prior to participating in the class (mean = 4.11, SD = 0.97). A *t*-test confirmed that PG students tend to prepare more before workshops as compared to UG students (P = 0.002). This finding was confirmed in the qualitative data, with both UG and PG students commenting that they would expect learners at the post-graduate level to be more active and self-directed learners.

- *"I think it's a way of learning. Yeah. So especially postgraduate student, you need to actively learn."* (2nd semester PG3).
- *"I've become a more active learner rather than just receiving knowledge directly from the lecturer or the coordinator"* (2nd semester PG3)
- *"At an undergraduate level, either the students need to become more postgraduate minded and do the readings and do a lot more … Be knowledge generators instead of knowledge receivers. Do the readings, apply themselves, do extra research."* (2nd year UG_6)

There was a strong positive correlation (0.520, P = 0.00) found between student's preparation for class and their overall learning experience. This result aligns with Jovanovic et al. (Jovanović et al., 2017) who confirm that student preparation through their engagement with learning materials prior to class is linked to performing well in a flipped class. Furthermore, in exploring the motivations behind what might drive students to prepare for class and hence contribute positively to their learning experiences, the qualitative data indicated that expectations and readiness for a flipped-blended learning workshop also depended on the students' mindset and attitudes. In coming to terms with their own expectations and facing the different way of learning compared with what they might have been used to in the past, the following comments were made:

- "*Because it's my first semester, I was so curious. Probably the education system is different. So I'm here, okay, in the mind, accept this is what we will do, what we will be, but the approach was very good."* (1st semester PG2)
- *"I would definitely be motivated because I am frustrated by if I'm in class and I don't know what's going on. So to avoid that I would do the work beforehand and then it'd all be fine."* (2nd year UG_6)
- *"Well, I'm very motivated to do well. I feel I have the ability to do well at uni and so I really feel like it would be a shame to let that go to waste and so I put a lot of time and effort into my work to achieve my potential."* (2nd year UG_6)

This reinforces the proposition P1, that preparation before class requires a shift in mindsets for self-management and responsibility. This means that student agency and ownership to be accountable for their own learning outcomes are important and rooted in their expectations and attitudes about learning. No significant difference was found in the students' preparation style for soft skills and hard skills courses.

5.3. Most effective online learning activities

Online learning activities are an integral part of flipped learning. Students were asked to report their engagement with online activities used in the six selected units. Table 3 shows the mean rating values of all learning activities. The learning activities are arranged in the descending order of mean ratings. There were no significant differences found in the mean rating of postgraduate and undergraduate and soft skills/hard skills courses. Workshop slides, embedded videos and discussion boards were found to be the top three most engaging elements of online learning. Reading links were found to be the least engaging. These mean values are further supported by students' interviews:

Table 3
Elements of online learning.

Elements of online learning	Mean rating	Standard Deviation
Workshop slides	4.43	0.75
Embedded videos	4.19	0.92
Assessed discussion boards	3.84	1.15
Links to other web pages	3.78	1.09
Links to social media	3.56	1.33
Un assessed discussion boards	3.43	1.32
Reading links	3.36	1

- *"I thought everything is very useful. I will say it is the discussion board and video. Because the video, I could watch it for every time, I could re-watch it. I could see if I have some problems or some questions, I could return to the video again.* (1st semester PG2)
- *"I think it [readings] doesn't matter"* (2nd semester UG3)
- *"But even though I consider myself highly motivated and want to do well, I still couldn't find the motivation to do the readings."* (2nd year UG3).

The findings further detail how students learn in a flipped-learning environment as illustrated in Fig. 3. Preparation prior to a workshop to acquire knowledge tended to revolve around viewing videos, completing online quizzes and discussion board tasks. These tasks were often completed only if they were linked to formal assessments. Students also used Google for further inquiries, but there was little engagement with readings unless these were related to an assessment task or specific classroom activity. In between the prework and class-time, students flexibly reviewed and reflected upon the content multiple times before attending the workshops. During the workshops, students described the sessions as opportunities to apply, clarify, share or expand upon their knowledge and ideas with both their peers and educators. A variety of workshop activities were described by the students including micro-lectures by educators, group discussions, Q&A sessions, role plays, games or case studies. After the workshop, some students (28 percent) continued to engage with the learning materials as these are readily available to them throughout the semester. They would access workshop slides to reflect and revise on the knowledge gained. Some, although rarely, looked into the readings. With the additional knowledge and new ideas gained in the workshops, others consolidated their knowledge and worked through their assessment tasks.

In transitioning to a workshop format, the data suggests that students effectively developed new ways of learning to learn, as an outcome of the transition. Some learners were shown to be more adept at setting up their own learning processes than others who struggle or require some time to adjust to their new environment.

The quantitative and qualitative findings demonstrate that student performance is linked to their abilities and attitudes in preparing and being ready for flipped learning. Their engagement with particular online materials, the multi-faceted and dynamic approaches different students take in their own learning, coupled with the support they need to help them acquire and extend their knowledge in the process then contribute to their overall learning experience. This brings us to posit that to support a student's knowledge gains, performance and ultimately a positive learning experience, the student engagement in the learning journey needs to be flexibly supported and scaffolded, and needs to appeal to the students' multi-faceted and dynamic approach to learning.

5.4. Challenges faced in workshop implementation

The qualitative and quantitative results confirm that most students reported to have an enhanced learning experience with the workshop

Fig. 3. Project Management students' approach to learning in a flipped-blended environment.

approach. Students were generally positive about the change in delivery modes from lectures and tutorials into a blended-flipped learning workshop format. However, this depended on the structure of the subject, how well the online learning materials were linked with the workshop activities, and the nature of workshop activities.

Negative sentiments of student learning experiences captured appear related to the structure of the subject and teaching style of the academic in the subject. For many international students coming into a new foreign learning environment, challenges exist where English is not their first language. Their off-campus learning environment may not be conducive for online learning, and active participation through workshops might not be the norm based on their past experience and culture. In addition to the usual cognition loads impacting all students, for international students, the foreign lifestyle, different learning processes and language challenges were reported to be highly stressful and a source of anxiety that could impact on a student's well-being and readiness for an active learning environment. Meanwhile, high achievers reported that they performed well regardless of the type of subject or teaching method, due to their levels of motivation and attitudes towards learning and grades.

Overall, students appreciated the engagement and access to academics, and the team dynamics in the workshops. Some students, both undergraduate and postgraduate, found the new learning delivery modes hard-going in the first few weeks as they needed time to get used to the changes and expectations for more self-directed knowledge acquisition. Issues with students' time management, and numerous learning tasks due before class across multiple workshop sessions suggest that to avoid the learning anxieties related to the different delivery modes, workshop sessions need to be planned systemically in the overall program curriculum. Further strategies to overcome the above-stated challenges and implications in fostering active learning are provided in the following section.

5.5. *Implications to enhance students' learning experience*

The findings demonstrate that it is important to set students up early for enhanced learning and success. Students face a higher cognitive burden in coping with new learning strategies befitting flipped learning, and acquiring new knowledge in the first few weeks of semester. To facilitate the learning pathways for preparation, knowledge gains, engagement, and fostering an overall positive learning experience, the results imply that to help students transition to a more active role, critical elements include clearly scaffolding student responsibilities for their own learning, providing a clear structure that connects the learning materials with the classroom activities and generating momentum in the learning process.

Scaffolding in flipped-blended learning environments is two-fold. First, scaffolding is needed in T&L elements including content, delivery and learning activities to ensure that these elements connect and build towards the students' successful achievement of their learning outcomes. Secondly, scaffolding the way students learn to help them 'learn to learn', is required to transition them from being passive learners to active learners. This will help empower students to become confident and have more responsibility and ownership of their own learning outcomes.

The research also implies that for students, learning and engagement are multi-dimensional and dynamic in nature. It is important to engage with students throughout the learning cycle (preparation prior to class, during and after), recognize that knowledge can be acquired through multiple means in a non-linear fashion, and extended through social and collaborative interactions. This suggests that educators have multiple opportunities to communicate and engage with students through various synchronous and asynchronous points of contact for the subjects through the LMS and workshops. In doing so, educators need to consider student timetables and workloads, offer learning support and consider sustainable practices for the longer term. It is important to streamline and align the design and structure of the subjects, and thoughtfully scaffold and link online elements to the students' overall learning experience.

Instead of a focus on passing exams or delivery through the 'sage on the stage', the focus for developing project leaders of the future should be through thinking, practicing and reflecting on these skills to develop project management competencies. The responsibility for a successful outcome is shared between the educator and student. Student agency is needed, with the educator providing a scaffolded environment to develop the self-directed and engaged learner that is able to navigate the technology driven environment that has now become commonplace not only in higher education and student learning, but in the work environment. When students are given freedom to interact with the learning content in their own way, the flipped environment tends to succeed better (Roehl et al., 2013). Subsequently, adaptability to new technologies, multi-modal communications and collaborative competencies are crucial for project management graduates in the contemporary workplace. The discussion and literature reinforce the importance of providing technology-infused education (blended learning), opportunities for dynamic interactions between students, learning resources and educators before, during and after sessions; and having students take active ownership of their learning.

This study is limited to a single project management program at one university in Australia that commenced in 2019 and continues into 2020–21. Another limitation of this study is that it relied on the self-reported level of engagement by students. It was outside the scope of

this study to use other methods to determine whether students were engaged, not engaged or disengaged. There is potential to do this in future research. There are opportunities for the study to be extended to other program areas or disciplines, different universities and different countries. There are further research opportunities to explore in further depth the concepts of flipped-blended learning across different cultures and mediums of learning. Future directions in this study include capturing the next facet of the multi-dimensional transitions into online, hybrid (face to face and online) and highly flexible (hyflex) teaching and learning, particularly in light of the recent global impacts of the Covid-19 pandemic in 2020 and its emergent effects on the future of project management and PMTL.

6. Conclusions

This paper discusses the students' learning experiences in a flipped learning environment. The findings highlight that student agency, autonomy, and preparedness drive knowledge acquisition, performance and the overall learning experience. Attitudinally, students with a mindset of readiness and pro-activity appear to have a more positive learning experience. Educators could foster an engaging learning climate through scaffolding and structuring how units are taught to inculcate student agency, ownership and collaboration in learning.

The PMTL climate expects a high level of flexibility and adaptability, the adoption of new digital skills and innovative approaches to T&L for both the educators and students. This detailed study into flipped-blended learning through workshops contributes to a novel way of engaging with PM students to enable upcoming project leaders that are equipped and ready to traverse an uncertain future. In light of recent disruptions to the learning environment that have propelled students towards increased self-directed learning, there are rich opportunities to understand how educators can scaffold and enhance the learning experiences of students regardless of whether the workshops occur on-campus or online. This is in line with how the project management discipline might foster project leadership in complex and uncertain times through innovative education design. The flipped and blended learning workshop environment that is nuanced with self-leadership, group work, active participation, and collaboration in project-work provides a readiness for graduates as they embark in a practical discipline of project management and project leadership.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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