

Enhancing Project Management Education: Investigating the Effectiveness of Flipped Learning and Active Experiential Learning Approaches

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Abstract *This study proposes an in-depth investigation into the efficacy of combining flipped learning and active experiential learning methodologies within the context of project management education at Open University Malaysia. The primary aim is to overcome the shortcomings of the traditional lecture-based teaching approach, which often falls short in engaging students and equipping them with the practical skills required for effective project management in real-world scenarios. By transitioning towards a more student-centered model through the implementation of flipped classrooms, this research seeks to enhance student engagement, learning outcomes, and overall satisfaction with the course. Employing a mixed-methods approach, the study will involve quantitative and qualitative techniques to gather comprehensive data. This includes pre- and post-assessment of students' knowledge and understanding of project management principles, alongside surveys and reflective journals to capture students' perceptions of the learning experience. The participant base will consist of students enrolled in a project management course, allowing for direct observation of the pedagogical strategies' impacts. The anticipated outcomes of this research are twofold. Firstly, it aims to provide empirical evidence on the effectiveness of integrating flipped learning and active experiential learning in project management education. Secondly, it seeks to offer actionable insights for educators and educational institutions on how to design and implement more engaging and effective instructional strategies. Ultimately, this study aspires to contribute significantly to the literature on educational*

methodologies in project management, paving the way for enhanced educational practices and student preparedness for professional success.

Keywords Active and Experiential Learning, Flipped Learning, Innovative Pedagogy, Project Management Course, Learning Outcomes.

INTRODUCTION

Open University Malaysia, referred to as OUM, was founded on August 10, 2000, marking its establishment as the seventh private university in Malaysia. Despite its classification as a private university according to the regulations stipulated in the Private Higher Education Institutions Act 1996, OUM harnesses the strengths, reputation, and competencies of its strategic partners - an assemblage comprising eleven public universities. Embracing the slogan "University for All," OUM's motto aptly mirrors its educational philosophy centred around democratising access to learning opportunities. OUM, the premier open and distance learning institution in Malaysia, has undergone a transformative shift in its instructional approach. Over time, OUM has transitioned from the blended pedagogical model, which encompassed a combination of self-directed study material, asynchronous online tutorial and face-to-face tutorials to implementation of Inclusive Digital Education. OUM acknowledge the change and progress in the Malaysian society and thus the incorporation of the flipped learning and active learning approaches is timely. OUM draws the advantage of adult education through its rich experiential learning potential. The move requires inclusion of instructional design that incorporates strategies such as reflective journals and guided online discussions. This is an on-going study on innovative pedagogy that parallels OUM's new commitment to sustainable quality education through alignment with the industry. This study deliberates on key concepts using the project management course as an example.

The concept of active learning has multifaceted dimensions involve methodologies like flipped classroom approach and experiential learning activities. The emphasis on active teaching techniques by Hanson and Moser (2003) aligns with immersing in hands-on experiences, simulations, and problem-solving tasks. McKinney (2010) affirmation of active learning as

cultivating critical thinking and collaboration resonates with essential project management skills. The triad of knowledge, skills, and attitudes (KSA) discussed reflects project management's multidimensional needs, emphasising practical application. Research into flipped and experiential learning recognises that project management education demands active participation to bridge theory and practice (Cranton, 2012). Ultimately, the active learning principles echo in the pursuit of enhancing project management education through flipped and experiential approaches, fostering engagement, skill development, and practical application in a holistic learning journey.

Experiential learning is an interactive and dynamic instructional approach, shares fundamental characteristics with the concepts of active learning. It prioritises student-centeredness by encouraging learners to assume control over their educational journey. Experiential learning, as highlighted by Senthamarai (2018), positions students at the core of the process, enabling them to steer their learning through meaningful tasks and critical reflection. The highly engaging nature of experiential learning (Smith et al. 2011) resonates with the foundational principles of active learning that fosters profound engagement and active participation. Such engagement holds particular significance in project management education, where the practical application and problem-solving learning (PBL) aspects hold paramount importance. The alignment with learning objectives and the emphasis on enhanced retention and comprehension of knowledge (Divya et al. 2016) echo the aims of active and flipped learning, both striving to enrich the educational outcomes for project management students. In relation to the role of instructors, the shift to mentors and evaluators (Graef, 2010) mirrors the transformation seen in active and flipped learning, where educators transition from being mere knowledge transmitters to facilitators of learning. This shift recognises the crucial role of educators as facilitators.

Flipped learning is a technique that combines self-study through guided instruction (emphasising the instructional design element in the content), and engagement through active learning through various strategies such as PBL. The concept of learning subject content through instructional materials outside

the classroom, followed by the application of the knowledge gained during in-class activities, resonates with the core principles of the flipped learning approach and its potential utility in project management education (Su and Chen 2018). Furthermore, the characterization of instructors' roles as transitioning from traditional lecturers to mentors aligns with the investigation's exploration of active experiential learning approaches and how instructors can facilitate students' active participation and engagement in their learning process (EDUCAUSE 2012). The discussion regarding flipped learning as a student-centred approach, incorporating theories such as constructivism, active learning, and peer-assisted learning, mirrors the investigation's pursuit of examining the effectiveness of flipped learning and active experiential learning within project management education (Bishop and Verleger 2013). Ultimately, the primary goal of flipped learning to enable self-paced preparation and enhance the quality of in-person interactions closely parallels the investigation's aim of leveraging innovative pedagogical methods to enrich project management education by focusing on practical application (Strayer 2012).

Within the domain of project management education, a novel objective has emerged: to equip students with the ability to navigate real projects, transcending the conventional approach of preparing adept technicians well-versed in project management methodologies but potentially challenged when confronted with intricate project scenarios (Wu, 2018). At each juncture of project-related activities, ranging from the initial selection of projects to their execution and continual monitoring, a range of essential steps must be navigated, including vigilant project oversight and meticulous allocation of resources, a process elucidated by Vala et al. (2017). When ideas or innovative capabilities prove robust following a series of rigorous attempts or processes designed to mitigate risks and enhance potential for success, these innovations stand ready for implementation within the context of a business project, an insight gleaned from the work of Svejvig & Andersen (2015). Methods and tools tailored for project management provide a structured means to confidently delineate project objectives, principal stages, requisite resources, and the timeline of project execution. Furthermore, they offer the flexibility to promptly make necessary adjustments in response to evolving circumstances, as

discussed by Tebekin (2017). An apt strategy is meticulously chosen to ensure optimal outcomes through the skillful utilization of a diverse array of tools and methodologies, an approach elaborated upon by Hornstein (2015). Within the domain of project management, a range of both national and international standards have been devised to encapsulate the Project Management Body of Knowledge (PMBOK), as exemplified by the development and publication of ISO 10006:1997 standards. Technological advancements could help to facilitate immersive interactions with project management processes and methodologies, empowering students to gain a comprehensive understanding of intricate systems.

The project management course analysed for the intended study is a three-credit hour course offered in the first semester of master project management program. The course discusses principles of project management which are necessary to help project managers make effective decision makings in managing their projects. The topics include the introduction to project management and covering the PMBOK 6th and 7th edition of the Project Management Institute. The course learning outcomes include: a) To analyse issues and challenges related to project management for seeking effective solution; b) To propose how a project can be managed efficiently by using appropriate processes, lifecycle, skills, tools, technique, planning and control; c) To construct the project management plans based on any project organisational setting and project environment. The transferable skills that learners will obtain at the end of the course are the cognitive skills, leadership, autonomy and responsibility, and communication skills. The assessment of the course consists of 60 percent of continuous assessment (assignment tasks based, reflective essay, oral presentation and online class participation) and a final examination component of the remaining 40 percent.

METHOD

The study employs a mixed-methods approach, combining quantitative and qualitative data collection and analysis techniques. Kumar (2014)

suggested that such approach would result a more thorough and accurate findings. The involvement of a pre-and post-assessment to measure students' knowledge gain and understanding of project management concepts will be adopted. Additionally, questionnaires and reflective essays was utilised to gather learners' feedback and perceptions regarding the effectiveness of flipped learning, active experiential learning strategies, and group assignment tasks. The target participants for this research are the master's degree learners who registered a project management course offered under the Faculty of Technology and Applied Sciences. The learners come from various Master Degree Programs such as Master of Project Management, Master of Business Administration, and Master of Occupational Safety and Health Risk Management and they are registered for the May 2023 semester. Ten active learners were involved in this study. Data collection began with a quantitative method in which a survey was distributed to 10 learners and only 8 of them answered the survey. The qualitative method used the reflective essay instrument which was given to 10 students and 10 of them successfully submitted the reflective essay.

RESULT & DISCUSSION

This section will discuss the findings of the flipped learning approach, active experiential learning through group assignment tasks, and the achievement of course learning outcomes based on the overall experience of the learners.

A. Flipped Learning Approach

Table 1 shows the ranking and preference that the learners chose for the flipped learning materials for the course.

Table 1. Ranking of the flipped learning materials

Flipped learning materials	Rank
E-module	1
Interactive online quizzes in E-lesson and Collaborative group assignment tasks	2

Online discussion forums/ Slides/Journals/Youtube links prepared by E-facilitator	3
Pre-recorded video lectures	4

It is interesting to see that the learners ranked the e-module as their top choice for flipped learning materials as e-modules are structured and organised to suit ODL and to ease the flow of reading the course content at individual learning pace. The interactive online quizzes and collaborative group assignment tasks are ranked second. The learners value the opportunity to engage with content and work together on the assignments. The materials prepared by the E-facilitator ranked third indicating that supplementary materials could help to reinforce the core concepts covered in the e-module. Video lectures were found at the bottom of the ranking which poses a question on its need as a supplementary material. Overall, the learners appreciate the self-paced e-module, interactive activities, and supplementary resources. This ranking suggests that a well-rounded approach to flipped learning, combining various materials and activities is likely to be most effective. Three quarter of the learners agreed that the flipped learning approach enhances their understanding of project management concepts and principles. They also agreed that the flipped learning approach promotes active participation in the course. Nevertheless, there are still challenges in terms of managing the time in reading the learning materials and participating in the scheduled activities.

B. Experiential Learning through Group Assignment Tasks

Table 2 shows the analysis of experiential learning through group assignment tasks via the Likert scale: 1 Significantly; 2 Yes to Some Extent; 3 Neutral; 4 Not Really; and 5 Not at All.

Table 2. Analysis of Experiential Learning Approach

Item/Likert Scale	1	2	3	4	5
Did the active experiential learning approach enhance your understanding of project	12.5%	37.5%	25.0%	12.5%	12.5%

management concepts and principles?					
How effective was the active experiential learning approach in promoting engagement and active participation?	0.0%	25.0%	50.0%	12.5%	12.5%
Did the active experiential learning approach improve your ability to apply project management skills in real-world scenarios?	12.5%	37.5%	25.0%	12.5%	12.5%

The challenges mentioned by the learners during the group assignment include time constraints, preference for individual assignments due to time constraints and working adults and difficulty in doing group assignments. The overall feedback from Table 2 suggests that while the active experiential learning approach had positive effects on understanding project management concepts and principles for a significant portion of participants, there is room for improvement in promoting engagement, active participation, and practical skill application. Addressing challenges related to time constraints and individual preferences could lead to a more effective and inclusive learning experience.

c. Course Learning Outcomes Achievement

Table 3 and Table 4 show the course learning outcomes achievement and the overall of rating in terms of the knowledge gained.

Table 3. Achievement of Course Learning Outcomes.

Likert Scale/Course Outcomes	Learning	Very weak	Weak	Fair	Good	Excellent
Analyse issues and challenges related to project management for seeking effective solutions.	-	-	25.0%	62.5%	12.5%	
Propose how a project can be managed efficiently by using appropriate skills,	-	-	25.0%	50.0%	25.0%	

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tools, techniques, planning, and control.						
Construct the project management plans based on any project organisational setting and project environment.	-	-	25.0%	62.5%	12.5%	

Data from the Likert scale indicates that a significant portion of learners achieved “Good” ratings in the course learning outcomes, showing a reasonable level of understanding and competence in project management concepts. Additionally, a smaller percentage of learners performed exceptionally well and received “Excellent’ ratings in these areas.

Table 4. Rating of knowledge gain and understanding of project management concepts.

Likert Scale/Rating	Very weak	Weak	Fair	Good	Excellent
Before taking the course	37.5%	-	12.5%	37.5%	12.5%
After taking the course	-	-	12.5%	75.0%	12.5%

Most learners (75%) rate their knowledge and understanding of project management concepts as "Good," indicating a significant positive impact of the course. A smaller percentage (12.5%) still rate themselves as having a "Fair" understanding, and another 12.5% have reached an "Excellent" level of understanding. Overall, the findings suggest that the course has had a positive effect on the knowledge gained and understanding of project management concepts among the respondents. The percentage of learners who rated themselves as having a "Good" understanding increased substantially after taking the course, while those with a "Fair" understanding remained relatively

stable, and a small portion achieved an "Excellent" level of understanding. The course appears to have effectively improved participants' knowledge and comprehension of project management concepts.

D. Reflective Essay Analysis

This section analyses of the reflective essay assignment using the thematic method from ten respondents. Table 5 to 12 shows some of the written reflective essays of the respondents. The theme categories have been identified as knowledge, skills, competencies in project management, adult learners, experiential learning, course design, and group work challenges.

Table 5. Written reflective of R1.

Respondent	Written reflective
R1	<p><i>No doubt, every successful project has a plan and goals as to reach the objectives. Since, the project management emphasis on the importance of planning in the project management, I am going to consider my goals course for this subject. [Knowledge: Planning]</i></p> <p><i>Through my assessment, the Project Charter is the original concept behind the project charter was to document the project manager's authority and responsibility, especially for projects implemented away from the home office. [Knowledge: Development of Project Charter]</i></p> <p><i>I am going to use the fundamental excellence skills in developing a successful project management. To begin with, planning skills that I planned to work on. [Competency: Project Management Planning]</i></p> <p><i>On the aspects of the schedules, the critical path method (CPM) on the estimated time for each task, I need to elaborate on each task that been listed, and the estimated time for each task. [Knowledge: Project Scheduling]</i></p> <p><i>In order to be a wise planner, I need to have the most primary aspects of the project. That will be the cost estimation [Knowledge: Project Cost Management]</i></p> <p><i>In order for the management to achieve the organizational goals, the Project Manager needs to make a sound decision. [Competency: Decision Making]</i></p>

The many processes and frameworks used to design, carry out, and deliver projects are referred to as project development approaches. [Knowledge: Project Management methodologies]

As the communication management is the formal or informal process of conducting or supervising the exchange of information either upward, downward, laterally or diagonally. [Knowledge: Project Communication Management]

Leadership will be one of the elements I will be embraced as my goal to be a wise planner. [Competency: Leadership]

The other aspects to be a skillful project manager in the future, has been part of the project management the retrospectives of the lesson learned need to be carried out during and shortly after the project life cycle. [Knowledge: Lesson-learned, Project life cycle]

Respondent 1 strongly emphasised obtaining knowledge, correct skills, and competencies in managing projects through the course. The importance of applying the project management body of knowledge is essential. Systematic execution and monitoring of projects through a good understanding of the project life cycle can be adopted at the workplace.

Table 6. Written reflective of R2.

Respondent	Written reflective
R2	<p><i>This project assignment provides an overview of project management and demonstrates how to put into practise the abilities we need for the field of project management, which depends on strong teamwork to accomplish all project objectives within the allotted time restrictions. [Competency: Effective and Efficient Project Management, Teamwork]</i></p> <p><i>We debated the SDGs' content and suggested headings. We all enumerate the 17 SDGs' components and offer our thoughts and opinions. [Knowledge: Sustainable Development Goals]</i></p>

Respondent 2 reflected that strong teamwork among group members is crucial to completing the assignment tasks within the stipulated time. Deep knowledge acquired on the sustainable development goals in relation to choosing the project scope of work for the assignment is also another pertinent element.

Table 7. Written reflective of R3.

Respondent	Written reflective
R3	<p><i>Since each of us are adult learners with other responsibilities, there are difficulties on maintaining constant communication with each other. However, we were able to leverage the use of technology such as WhatsApp group for updating quick and short information, as well as the my Inspire forum for a more thorough discussion among team members. Additionally, we were able to set and maintain a weekly meeting schedule to meet and discuss with each other using Google Meet. In short, this project assignment has been a great experience for me in regard to the assignment management, as well as the team management, especially in managing virtual team of adult learners.</i></p> <p><i>[Competency: Communication, Teamwork]</i></p>

Challenges as adult learners is another element that respondent 3 stated in completing the course assignment as all learners are distant in nature and had to respond in a virtual method.

Table 8. Written reflective of R4.

Respondent	Written reflective
R4	<p><i>The initial thought process of reading the assignment question, and finding out that it was a group assignment, went from dread, to uncertainty, to optimism, and then confidence, as well as everything in between. It was an interesting process to say the least.</i></p> <p><i>One of the most important factors in organising the assignment was communication.</i></p> <p><i>Every team member was very honest about their ability to complete work according to plan, as well as being accepting of others' limitations. This culture of</i></p>

transparency led to a very conducive and positive environment in which to work.

[Competency: Communication, Transparency & Attitude: Confidence,]

Overall, this Project Management course has been an enjoyable and eye-opening experience for me. I had learnt many things from my lecturer through the eTutorials, as well looking at different perspectives through the interactions with my coursemates on the online forums. The rich exchange of ideas, challenges to my personal views, as well as the consideration of opposing views from others is something that has definitely broadened my mind.

[Competency: Collaboration, Experiential learning]

Discovering the processes involved in the managing of a project, was also a highlight. Refined over many decades, evolving with the times and technology, but also varied in different parts of the world. Learning that there are so many aspects to consider when managing a project lends new respect for the teams that are on the ground, managing various projects in a wide variety of industries, all over the world. From small projects that range from a few tens of thousands of ringgit, all the way to multi-billion ringgit national projects, the responsibility of the personnel involved in project management is nothing short of incredible. The level of knowledge, skill, and discipline brought by the personnel involved can either make or break a project.

[Competency: Project management methodologies, Teamwork]

Respondent 4 relates the journey which improved the overall experience from uncertainties towards optimism and increase in confidence level through the group assignment.

Table 9. Written reflective of R5.

Respondent	Written reflective
R5	<p><i>These assignments improved my abilities to manage real-world project circumstances and helped me comprehend the practical consequences of project management ideas.</i></p> <p><i>Overall, my understanding of project management has been dramatically shaped by the preparation of the project assignment tasks and the course experience. I now have the knowledge and confidence to manage projects successfully because of a combination of theoretical understanding, real-world experiences, and interaction with peers and subject matter experts. I appreciate the possibilities for growth and learning during this course, and I'm eager to use what I've learned to help manage projects in the future.</i></p> <p><u><i>[knowledge, competencies, collaboration, experiential learning]</i></u></p>

Respondent 5 appreciated the course experience and the project assignment tasks that improved the ability to manage real-world projects through understanding of the theoretical aspects, real-world experiences, and collaboration with peers from different industries.

Table 10. Written reflective of R6.

Respondent	Written reflective
R6	<p><i>The programme was thoughtfully designed, offering a healthy blend of academic ideas and real-world applications. Because the course was interactive, I was able to have conversations with my classmates and build a collaborative learning atmosphere that valued different points of view and constructive criticism.</i></p> <p><i>The promotion of originality and independent thought was one feature that really caught my attention. The course assignments emphasised critical thinking and applying knowledge in new ways rather than just having students memorise facts. This strategy not only improved my problem-solving abilities but also gave me more self-assurance while dealing with real-world situations.</i></p>

[Course Design: Collaborative learning, Critical Thinking, PBL, Experiential learning]

In hindsight, the course experience also helped me understand the value of efficient organisation and time management. It took careful planning and prioritisation to juggle project tasks, coursework, and personal commitments. I gained more discipline and structure in how I manage my time as a result, which will surely help me in my future endeavours.

[Competency: Time management, Prioritisation]

In conclusion, this course's project assignment assignments had a significant impact on how I learned. The preparatory procedure required commitment, investigation, and a pro-active attitude. These tasks gave me the chance to put my academic knowledge to use in real-world situations and honed my critical thinking skills. Additionally, the course as a whole was enriching and promoted a collaborative learning environment that promoted originality and independent thought. I will use the knowledge I've obtained from this course, my experiences, and my abilities as significant assets in my future academic and professional endeavours.

[Competency: Critical thinking, Collaborative & Attitude: Pro-active.]

The overall reflection from respondent 6 indicated that the course design is suitable for adult learners and the course content covers both theoretical aspects and real-world applications. In addition, the course also enriches the learners' critical thinking, problem-solving, collaboration, teamwork and time management skills.

Table 11. Written reflective of R7.

Respondent	Written reflective
R7	<i>My challenge for Project Management subject in OUM is, absurd, mainly on the team and group video presentation. Trying to get a group and to make this happen is so</i>

difficult. I think OUM need to understand that we are working adults and not everyone is cooperative.

One of the respondents stated that the challenge in completing the assignment in a group is difficult to manage as they are working adults and lack cooperation.

Table 12. Written reflective of R8.

Respondent	Written reflective
R8	<p><i>... the course fostered my ability to think critically and analyses complex problems. The project assignment required me to integrate knowledge from various disciplines, such as architecture, engineering, and environmental science, to propose sustainable solutions. Additionally, the course provided ample opportunities for self-reflection and growth. The feedback and guidance received from instructors and classmates were instrumental in refining my ideas and improving my communication skills.</i></p> <p><i>[Competency: Critical thinking, Communication, & Learning Skill: Self-Reflection]</i></p>

The last respondent highlighted the importance of knowledge integration to complete the assignment tasks and to propose sustainable solutions. Other aspects that also conquered with other respondents are critical thinking, communication skills as well as growth, and self-reflection.

CONCLUSION

This study explored the incorporation of strategies in view of the university's current transformation towards Inclusive Digital Education. The project management course selected for this study provided the opportunity to analyse qualitative responses from a total of ten learners. The achievement of learning outcomes for the course is largely positive with a marked difference between before and after the course. The use of experiential learning strategy is seen positive in terms of knowledge and skill acquisition. However, the learners were not satisfied with the level of participation in Group Work. The thematic analysis of the learner's transcribes showed highly positive feedback ranging from Course Design and use of strategies such as Experiential

Learning, and Problem Based Learning. Most feedback tends to focus on positive experiences in terms of knowledge and competency acquisitions. Competency acquired range from project management competencies, and soft skills. The soft skills stated include 21st Century skills such as Communication, Collaborative and Critical Thinking Skills, and others. What is more impressive is discovery of the change in attitude in terms the respondent's Confidence and Pro-active attitude. The only dissatisfaction found is in the requirement to work in a group that was dampen by the level of participation. Nevertheless, there are positive outcomes from the group work in team of engagement with people from different industries and development of their teamwork competency. The findings reveal that the direction taken is indeed positive and further exploration in terms of innovative pedagogy towards greater active participation should be pursued. The use of video lecture must be tested against its use and effectiveness through standard user experience tests.

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