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Exploring Undergraduate Student Engagement and Motivation through Project-Based Learning: A Case Study at ACLEDA University of Business

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ABSTRACT

This study investigates the impact of Project-Based Learning (PBL) techniques on undergraduate student engagement and motivation at ACLEDA University of Business (AUB). Employing a mixed-methods approach, the research involved a survey with 91 students and used semi-structured interviews with 20 key participants. Four PBL techniques– book reviews, role-play interviews, debate activities, and research proposals– were implemented to assess their influence on student engagement. The findings indicate that PBL significantly enhances student engagement by providing real-world context, fostering collaboration, and promoting learner autonomy. Qualitative data further reveal improvements of students' critical thinking, communication, confidence, and teamwork skills. The study concludes that PBL is an effective pedagogical strategy for improving student participation and motivation in higher education settings.

Keywords: Project-Based Learning, Student Engagement, Engagement theory, Motivation

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1. Introduction

Background of the study

In today's educational landscape, promoting student engagement and motivation is essential for achieving meaningful learning outcomes, particularly in higher education. Engagement is not merely a desirable trait—it is a prerequisite for deep learning, persistence, and academic success. However, traditional lecture-based instruction often fosters passivity and disengagement among students (Spencer Clark et al., 2020; Widiasani, 2012). Luo et al. (2019) emphasize that low levels of engagement and motivation can hinder academic achievement and reduce students' overall satisfaction with their learning experience. In response, educators are increasingly turning to active learning strategies that place students at the center of the learning process. Among these, Project-Based Learning (PBL) stands out for its ability to integrate real-world relevance with collaborative inquiry. It fosters active learning by encouraging students to take ownership, solve problems creatively, and develop critical thinking skills (Anderman & Patrick, 2012; Bryson, 2014; Widiasani, 2012).

Despite growing interest in PBL, its adoption in Cambodian higher education remains limited and uneven. While some institutions have begun experimenting with active learning models, there is a lack of systematic research on how PBL affects student engagement across its behavioral, emotional, cognitive, and agentic dimensions.

Problem statement

Universities in Cambodia face a pressing challenge: preparing graduates to thrive in dynamic, team-oriented business environments that demand clear communication, creative problem-solving, and collaborative competence. While Project-Based Learning (PBL) has been recognized as a promising pedagogy to cultivate such skills, empirical investigations into its effectiveness with Cambodian higher education institutions (HEIs) has remained scarce.

Some initiatives, such as UNICEF's Local Life Skills Education project, have incorporated problem-based learning elements at the secondary level (KAPE, 2022). However, these efforts remain largely descriptive and lack rigorous evaluation of engagement outcomes. In higher education, related studies have examined digital literacy and engagement (Kim & Heng, 2023) or learner autonomy in English as a Foreign Language (EFL) contexts (Touch & Som, 2024), but none have directly addressed how PBL affects the multidimensional nature of student engagement in HEIs.

This gap highlights the need for empirical research on PBL's role in enhancing student engagement in Cambodian universities, particularly in business programs where real-world application and teamwork are essential. At ACLEDA University of Business, the integration of PBL techniques such as role-playing, debates, book reviews, and research proposals offers a promising avenue to align academic content with students' interests and career aspirations.

Research objective

This study aims to examine the impact of Project-Based Learning (PBL) techniques on student engagement and motivation among undergraduates at ACLEDA University of Business.

Research question

How do Project-Based Learning techniques influence student engagement and motivation among undergraduates at ACLEDA University of Business?

Significance of the study

This study addresses the persistent challenge of low student engagement and motivation in higher education, particularly within traditional lecture-based environments. By exploring Project-Based Learning (PBL) at ACLEDA University of Business, it demonstrates how real-world, collaborative activities—such as role-play interviews, debates, and research proposals—can shift students from passive recipients to active participants. The findings reveal that PBL techniques effectively enhance emotional and agentic engagement while fostering critical thinking, communication, and teamwork skills—competencies essential for preparing students for academic success and career readiness. Importantly, the study provides practical insights for educators in Cambodia and similar contexts. It shows how PBL can transform business education into a more dynamic, student-centered model that promotes deeper learning and sustained motivation.

2. Literature Review

Overview of Project-Based Learning

Project-based learning (PBL) is a student-centered pedagogical approach that emphasizes the use of real-world, authentic projects as the primary vehicle for learning and

engagement (Veselov et al., 2019) The approach shifts the focus from the traditional teacher-centered instruction—where students passively receive information—to a more student-centered environment where learners actively construct their own knowledge and skills through meaningful experiences (Thomas, 2000). PBL encourages students to learn and apply knowledge and skills through inquiry-driven tasks that involve student autonomy, constructive investigations, goal-setting, collaboration, communication, and reflection within real-world contexts (Guo et al., 2020).

The extensive research highlights the benefits of PBL in promoting student engagement, motivation and ownership of their learning process. It cultivates a sense of autonomy and purpose, which enhances intrinsic and leads to improved affective, cognitive, and behavioral outcomes in higher education (Almazroui, 2023). As an active learning strategy, PBL supports long-term retention and learning effectiveness by integrating practical application, collaboration, and reflective thinking. PBL can enhance long-term learner engagement through flow-like conditions, group cohesion, and a focus on the long-term goal (Aubrey, 2022,Chheun & Kong, 2023). It promotes essential 21st-century competencies by embedding autonomy, communication, and problem-solving into the learning process (Kokotsaki et al., 2016a). Importantly, student engagement is influenced by motivation, self-efficacy, and context, with factors such as parental involvement, teacher-student relationships, and peer relationships playing key roles (Sandra L. et al., 2012). As a dynamic and relational process, engagement significantly impacts students' academic experiences and outcomes in higher education.

Techniques used in Project based Learning

PBL educators employ employs a range of instructional techniques to enhance students' engagement and deepen their understanding through real-world application. The techniques equip learners with 21st century skills including communication, collaboration, creativity, and critical thinking skills (Bell, 2010).

Among the most widely used PBL techniques are role-playing, debates, and research proposal development, each contributing uniquely to the cultivation of inquiry, reflection, and problem-solving (Thomas, 2000; Bell, 2010). For instance, role-playing immerses students in simulated real-world scenarios, compelling them to adopt different perspectives and navigate complex social dynamics (Kokotsaki et al., 2016a). Through role-playing, students develop empathy, communication proficiency, and the ability to apply theoretical knowledge to practical situations, thereby fostering a deeper understanding of the subject matter and enhancing their interpersonal skills (Poorman, 2002).

Debates, as a structured form of argumentation, promote critical thinking, research skills, and persuasive communication (Amin et al., 2024). Students engaged in PBL debates must meticulously research their assigned positions, construct logical arguments, and effectively counter opposing viewpoints, thereby honing their analytical and rhetorical abilities (Almazroui, 2023).

Constructing a research proposal cultivates inquiry skills and scientific thinking by guiding students through the process of formulating questions, designing methodologies, and anticipating outcomes, which mirrors authentic academic and professional research practices (Krajcik & Blumenfeld, 2005).

Together, these techniques embody the core principles of PBL: fostering autonomy, critical thinking, collaboration, and meaningful learning experiences that prepare students for academic and professional success.

Student Engagement Theory

Student engagement theory posits that learning outcomes are shaped not only by instructional delivery but also by the degree to which students are behaviorally, emotionally, cognitively, and agentically involved in the learning process (Reeve, 2012). The Student Engagement Framework provides a theoretical foundation for understanding how and why students become meaningfully invested in their education.

Engagement refers to the extent of a student's active involvement in learning activities (Reeve, 2012a). In the context of PBL, student engagement is sustained through flow-like conditions during tasks, control, interest, challenge-skill balance, group cohesion, and a growing focus on the long-term goal (Aubrey & Riley, 2024). There are four distinct features of student engagement framework yet interconnected engagement aspects as behavioral, emotional, cognitive and agentic engagement (Zhong et al., 2024) student engagement as a meta-construct that includes behavioral, emotional, and cognitive engagement (Fredricks & McColskey, 2012).

Behavioral Engagement focuses on students' concentrated attention, sustained effort, and prolonged involvement in tasks through active participation, interactions with team members, and engagement in learning activities (K. Aubrey & Riley, 2024). A mastery orientation is associated with positive academic behaviors. Emotional engagement involves the presence of emotions that facilitate tasks and the absence of emotions that hinder tasks according to (Sandra et al., 2012). It explores how emotional engagement influenced by factors like enjoyable experiences, and positive emotions related to

engaging topics and activities in project-based learning. Affective engagement provides the incentive for students to participate behaviorally and to persist in school endeavors and students feel included in the school community, part of their own lives (belonging), and recognize that school provides tools for out-of-school accomplishments (Martin & Collie, 2019). Cognitive engagement entails the application of advanced, profound, and individualized learning strategies including utilizing critical thinking skills, and engaged intellectually with the tasks and the projects assigned (Veiga, Melo, et al., 2014). Cognitive engagement is the expenditure of thoughtful energy needed to comprehend complex ideas in order to go beyond the minimal requirements (L. Guo et al., 2023).

Agentic engagement involves actively contributing to the progression of learning activities and enhancing learning rather than passively receiving knowledge, it is the ownership of their learning, contributed meaningfully tasks, interacting with teachers and peers in a proactive manner (Montenegro, 2017).

Together, these dimensions form a comprehensive model for understanding student engagement, particularly within active learning environments like PBL, where autonomy, collaboration, and relevance are central to sustained academic involvement.

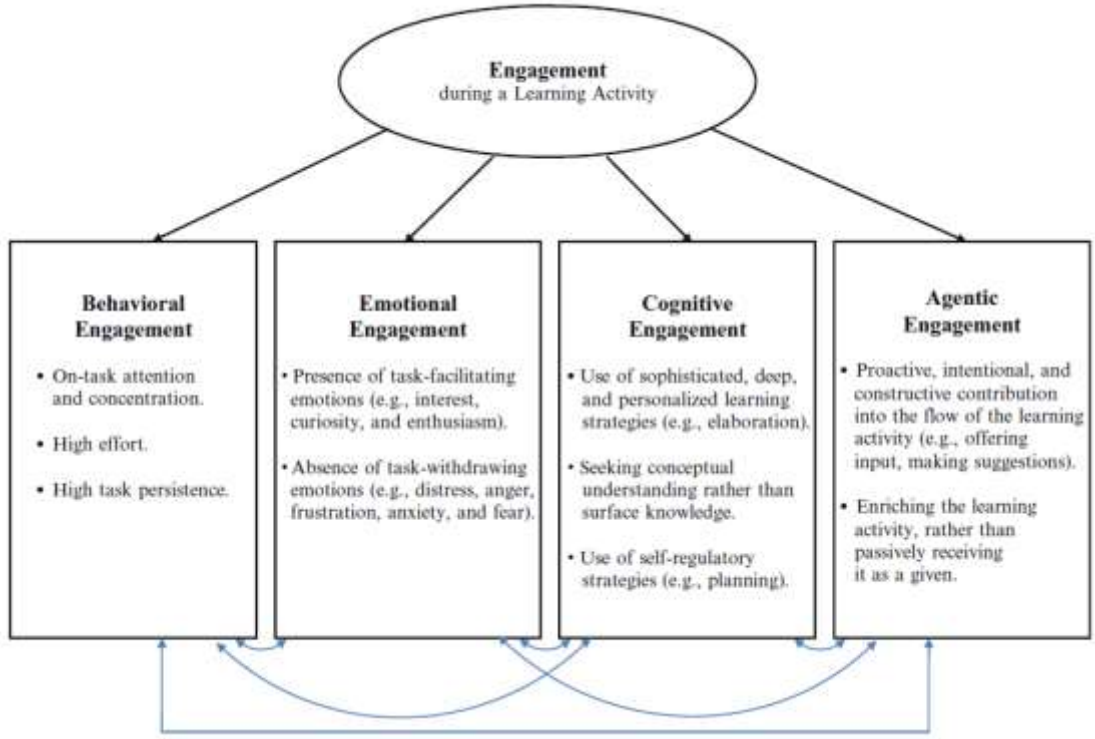

Figure 1: Engagement Framework

The framework is used to evaluate different dimensions of student engagement and determine factors that influence student participation and learning experiences in PBL environments and settings (Zhong et al., 2024). Academic engagement refers to behaviors related directly to the learning process such as attentiveness and completing assignments in class and at home or augmenting learning through academic extracurricular activities (Joshi et al., 2022). Academic engagement in the form of homework completion was examined in relationship to academic performance in two studies. Social engagement refers to the extent to which a student follows written and unwritten classroom rules of behavior, for example, coming to school and class on time, interacting appropriately with teachers and peers, and not exhibiting antisocial behaviors such as withdrawing from participation in learning activities or disrupting the work of other students (Mandernach, 2015).

The research study by Reeve (Reeve, 2012b, 2012a) shows that high-quality students 'engagement comprised of quality of students' engagement and learning environment, high-quality student engagement involves active participation, enthusiasm, focus, and persistence in learning activities. A positive learning environment is defined by supportive teacher-student relationships, a sense of belonging, clear expectations, opportunities for collaboration, and access to resources that enhance learning (Sandra. et al., 2012) and the measurement of student engagement involves assessing cognitive and psychological aspects, motivation, self-regulation, and goal orientation (Finn & Zimmer, 2012).

Towards Conceptual Framework: Student engagement

Engagement Theory in Higher Education Level

PBL offers students the chance to take an active role in their education by working on authentic and meaningful problems. In higher education, this approach aligns closely with Engagement Theory, which highlights that students learn best when they are active participants, working collaboratively toward purposeful goals (Shneiderman et al., 1998). Through PBL, learners become engaged in multiple ways: they think critically and apply knowledge (cognitive engagement), find relevance and personal value in the tasks (emotional engagement), and take ownership of their learning by making independent choices (agentic engagement). Engagement, therefore, involves not only the mind but also motivation and participation. Studies suggest that when students are challenged with real-world contexts, they are more likely to remain engaged and develop independent thinking skills (Fredricks & McColskey, 2012,Thomas, 2000).

Student engagement is conceptualized through four interrelated dimensions: behavioral, emotional, cognitive, and agentic engagement. First, behavioral engagement refers to students' active participation and sustained effort in learning tasks, evident in teamwork, communication, confidence-building, and practical skill application (Reeve, 2012a, 2012b). Second, emotional engagement captures students' affective responses—such as interest, enjoyment, and emotion regulation—that support persistence and meaningful involvement in learning (Reschly & Christenson, 2022; Sandra L. et al., 2012). Third, cognitive engagement involves deep learning strategies and higher-order thinking, including critical analysis, perspective-taking, and applying knowledge to complex issues (Reeve, 2012a, 2012b; Veiga et al., 2014). Finally, agentic engagement describes students' proactive role in shaping their learning through self-regulation, goal-setting, real-world connection, and intellectual independence (Reeve, 2012a, 2012b; Montenegro, 2017).

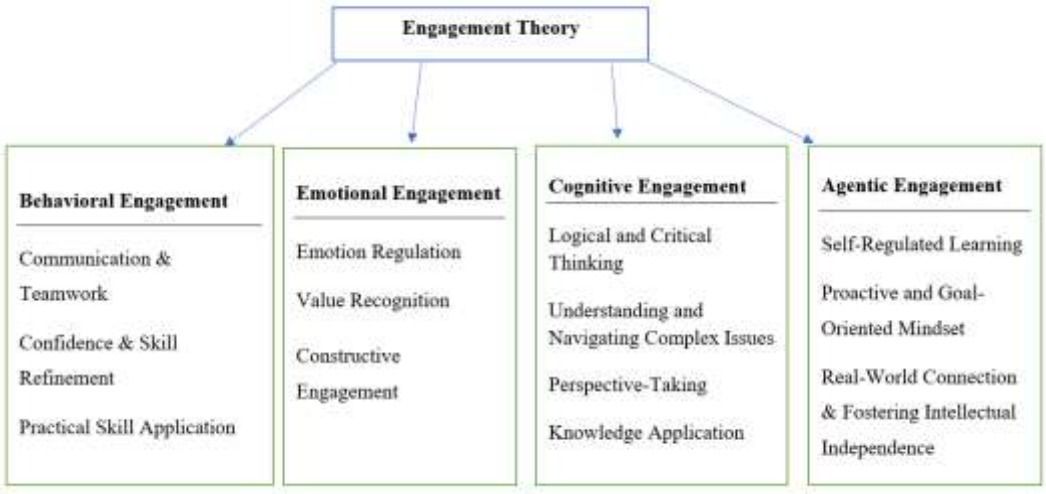

Figure 2: Engagement Theory

3. Research Methodology

Research design

This study employed a mixed-methods research design to explore the techniques used in PBL and their impact on student engagement. The quantitative aspect involved a questionnaire survey, while the qualitative component consisted of semi-structured interviews. Quantitative data were analyzed using descriptive statistics, specifically the mean and standard deviation, to summarize participant responses and identify central tendencies. The qualitative data, gathered from interview transcripts, were examined

using thematic analysis, which allowed the researchers to identify key patterns and emerging themes related to classroom practices and student motivation (Braun & Clarke, 2021; Finn & Zimmer, 2012).

Research area

The research was conducted at ACLEDA University of Business (AUB) in Phnom Penh, Cambodia. Classroom settings, using classroom settings as the primary research sites. It focused on examining the relationship between project-based learning techniques and student engagement, motivation, and academic performance across one or more semesters.

Population and sample

The target population for this study consisted of undergraduate students enrolled in the bachelor's degree program at ACLEDA University of Business (AUB), specifically those in Year 1 (Semesters 1 and 2) and Year 3 (Semesters 1 and 2). These groups were chosen as the accessible population based on their engagement with PBL activities. Simple random sampling was employed to select the 91 student respondents, giving each student an equal chance of participation and reducing selection bias.

For the qualitative component, a purposive sampling method was used to select 20 participants for in-depth interviews. These students were intentionally chosen based on their active participation in project-based learning environments and their ability to provide detailed reflections on the techniques used in PBL. This method ensured that participants had relevant experiences to contribute meaningful insights to the study. The degree of sample homogeneity was also considered. As Burmeister and Aitken (2012) point out, homogeneity—often measured by the standard deviation—reflects the similarity among participants and contributes to the quality of the findings.

Research tools

The study employed two primary data collection tools to explore student engagement in PBL: a structured survey questionnaire and semi-structured interview questions. The survey questionnaire was developed using Google Forms. It was designed to measure four key constructs of student engagement: Behavioral engagement, emotional engagement, cognitive engagement, and agentic engagement, as conceptualized by Reeve and Tseng (2011). The survey consisted of two sections: Section 1 gathered demographic data, while Section 2 included 27 closed-ended items aligned with four engagement constructs, rated on a seven-point Likert scale (1 = strongly disagree to 7 = strongly

agree). Moreover, semi-structured interviews were conducted to explore how specific PBL techniques influenced student engagement The interviews included four open-ended questions, which addressed the four selected PBL techniques: book review, role play, debate, and research proposal.

The measurement questions are shown in the table 1.

Table 1: Measurement questions on themes

Theme	Items	Sources
Behavioral Engagement	-I try hard to do well in school. -In class, I work as hard as I can. -When I'm in class, I participate in class activities. -I pay attention in class. -I am willing to try new activities. -I am an active participant in school activities and events. -I take an active role in extracurricular activities at my school. -I care about grades.	(Fredricks & McColskey, 2012)
Emotional Engagement	-I feel interested and happy to participate in a new learning approach. -I am very interested in a project-based learning approach. -I think project-based learning is helpful for my future opportunities. -I enjoy learning new things in class. -I like what I am learning in school. -I like my school. -I am proud to be at this school.	(Fredricks & McColskey, 2012)
Cognitive Engagement	-I demonstrate appropriate effort for the task. -I am a self-motivated person. -My teachers include me in classroom activities. -My teachers encourage me to do my best. -When I study, I try to understand the material better by relating it to things I already know. -I prefer project-based learning activities because they might be instrumental in the real world.	(Veiga, Reeve, et al., 2014) (Fredricks & McColskey, 2012)
Agentic Engagement	-I am active in a learning activity. -I do my best in school. -I participate in class activities. -I attend school activities. -I participate in extracurricular activities.	(Sandra L. et al., 2012)

The level of agreement analysis

According to Armstrong (1987), the level of agreement is that the higher the score, the more important the variable. The Likert scale was used to measure students' engagement and motivation in teamwork through PBL's activities, as shown in the table 2.

Table 2: The Level of Agreement Analysis of the Likert Scale

No	Likert Scale	Accepted scored rank	Source
1	Strongly Disagree	1.00 - 1.84	(Armstrong, 1987)
2	Disagree	1.84 - 2.70	
3	Somewhat disagree	2.70 - 3.56	
4	Neutral	3.56 - 4.42	
5	Somewhat Agree	4.42 - 5.28	
6	Agree	5.28 - 6.14	
7	Strongly Agree	6.14 - 7.00	

Data collection

Data were collected using both quantitative and qualitative methods to explore student engagement and perceptions of techniques used in PBL. A total of 91 undergraduate students participated in the structured survey, which was distributed online via Google Forms. The survey targeted students across academic years and measured four dimensions of engagement: behavioral, emotional, cognitive, and agentic. In addition to the survey, 20 students majoring in Finance and Banking, and Accounting were purposively selected for face-to-face interviews. The interviews were conducted in classroom settings and followed a semi-structured format to allow for open-ended responses. This approach enabled researchers to collect rich, qualitative data on students' experiences with specific PBL techniques, including role play, debate, and research proposal. A combination of online surveys and in-person interviews ensured methodological triangulation, enhancing the validity and depth of the findings (Creswell & Creswell, 2018).

Data analysis

Survey responses were collected via Google Forms and exported into a spreadsheet for processing. The data were converted into numerical format and analyzed using SPSS

version 23, applying descriptive statistics such as means and standard deviations for each variable (Tabachnick & Fidell, 2013).

Thematic analysis is primarily used for analyzing qualitative data. It is defined as the method for identifying and analyzing different patterns in the data. A theme represents the core ideas and arguments under a particular concept (Flick, 2022). A method of both data collection and data analysis in which a given content, textual, visual, graphic, is examined systematically and rigorously to identify meanings, themes, patterns, and assumptions. Qualitative content analysis (QCA) focuses on gathering and interpreting an existing body of material (Hurst, 2023; Mayring, 2021). Codes such as KI 1 through KI 20 were assigned to semi-structured interviews with key research participants. Exemplary quotes from these interviews were used to substantiate and illustrate the relevant thematic findings (Norng et al., 2021).

Ethical consideration

Ethical considerations were carefully observed throughout the research process to ensure the integrity, credibility, and transparency of the study. The researchers strictly avoided plagiarism by properly citing all literature sources, data references, and intellectual contributions from previous authors. Informed consent forms were provided to all participants prior to data collection, explaining the study's purpose, the voluntary nature of participation, and the confidentiality of their responses.

4. Results and Discussion

Demographic information

The demographic information included gender, age, academic major, and educational background. The gender distribution revealed that 87.9% (n = 80) were female, while 12.1% (n = 11) were male. In terms of age, the majority (68.1%, n = 62) were between 20 to 25 years old, followed by 28.6% (n = 26) under 20 years old, and only 3.3% (n = 3) were between 26 to 30 years old. Regarding academic major, 52.7% (n = 48) were enrolled in Finance and Banking, and 47.3% (n = 43) in Accounting. Concerning the level of degree, most participants were pursuing a Bachelor’s degree (94.5%, n = 86), followed by 4.4% (n = 4) at the Master’s level, and 5.15 (n = 5) at the Associate level.

Table 3: Demographics

Respondents' demographic	Category (n=91)	Frequency	Percentage
Gender	Male	11	12.1
	Female	80	87.9
Age	Under 20 years old	26	28.6
	Between 21 to 25 years old	62	68.1
	Between 26 to 30 years old	3	3.3
Major	Finance and Banking	48	52.7
	Accounting	43	47.3
	Associate	5	5.5
Degree	Bachelor	86	94.5

Descriptive statistics

Table 4 presents the descriptive statistics of four engagement dimensions—Behavioral (BE), Emotional (EE), Cognitive (CE), and Agentic (AE)—based on responses from 91 participants. The mean scores for all variables ranged from 5.79 to 5.99 on a 7-point Likert scale, indicating a high level of agreement among students. Emotional engagement recorded the highest mean (M = 5.99, SD = 0.59), followed closely by agentic (M = 5.92, SD = 0.59) and cognitive engagement (M = 5.85, SD = 0.61), while behavioral engagement showed a slightly lower mean (M = 5.79, SD = 0.70). The low standard deviations across variables reflect consistent responses, suggesting that students generally perceive themselves as highly engaged across all dimensions, with particularly strong emotional and agentic involvement.

Table 4: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Level of Agreement
BE	91	2.43	7.00	5.7991	0.70469	Agree
EE	91	3.25	7.00	5.9945	0.58657	Agree
CE	91	4.14	7.00	5.8509	0.61313	Agree
AE	91	4.00	7.00	5.9209	0.58945	Agree

Student engagement

The result of semi-structure interview classified into four major themes: behavioral engagement (Theme 1), emotional engagement (theme 2), cognitive engagement (theme 3), and agentic engagement (theme 4), and sub-themes.

Table 5: Themes- Sub-themes and Key Informants

Themes	Sub-themes	Key Informants (KIs)
Behavioral Engagement	Communication & Teamwork	KI 1
	Confidence & Skill Refinement	KI 2, KI 4
	Practical Skill Application	KI 3
Emotional Engagement	Emotion Regulation	KI 1, KI 5
	Value Recognition	KI 2, KI 4
	Constructive Engagement	KI 3, KI 19
Cognitive Engagement	Logical and Critical Thinking	KI 5, KI 18
	Understanding and Navigating	KI 6
	Complex Issues	KI 7, KI 13
	Perspective-Taking	KI 8, KI 14
		KI 9, KI 17
Agentic Engagement	Knowledge Application	KI 10,
	Self-Regulated Learning	KI 11, KI 12, KI 16, KI 20
	Proactive and Goal-Oriented Mindset	
	Real-World Connection & Fostering Intellectual Independence	

Behavioral Engagement

The The findings indicate that students actively participated in learning by engaging in real-world skill practice, peer collaboration, knowledge application, and confidence-building. This dimension of engagement was evident through patterns such as communication and teamwork, practical skill application, and the refinement of both confidence and academic competencies.

The response shows that role-play interviews enhance collaborative learning by fostering teamwork, communication with different stakeholders, and interpersonal skill development, benefiting both participants and interviewers. It is viewed as a safe environment where students can practice, receive feedback, and gradually build confidence, reinforcing the value of experiential learning. It takes role as the connection between theory and practice by allowing students to apply classroom knowledge to

realistic scenarios, strengthening career preparedness. It firstly had initial discomfort in role-play interviews but later on it transforms into growth, gaining confidence, intimidated weaknesses, and refining essential interview skills. As KI 3 emphasized, "Role-play interviews helped me connect theory with practice. It was like bringing classroom learning into a real-world situation."

The role-play interviews serve as a powerful tool for fostering student engagement through real-world skill development, collaborative learning, and confidence-building. These activities not only bridge theory and practice but also provide a supportive environment for personal growth, helping students refine essential competencies for academic and professional success.

Emotional Engagement

The findings highlight students' ability to regulate emotions, recognize value in learning, and engage constructively with activities that promote self-growth. These patterns were reflected in areas such as emotion regulation, value recognition, and proactive involvement in learning tasks that foster self-development.

The study has found that academic tasks such as debates helped students learn to separate emotions from logic, thereby enhancing their resilience in both personal and professional contexts—a process referred to as emotion regulation. The findings show that emotional engagement plays a vital role in students' personal and academic growth. Through activities like debates and group projects, students developed emotional regulation, internal motivation, and a deeper sense of purpose—transforming initial discomfort into resilience, collaboration, and long-term commitment to learning. Students stress their internal motivation and long-term value, this activity is not just about marks, but about personal commitment, how learning connects with who they want to become. As KI 1 stated:

In debate, it's essential to separate emotions from arguments by focusing on evidence and logic rather than gut reactions—an important skill that benefits both personal relationships and professional negotiations.

These insights underscore the transformative potential of emotionally engaging academic tasks in shaping students' self-awareness and long-term learning orientation. The development of emotional regulation and value-driven motivation reflects a deeper integration of personal growth within educational experiences.

Cognitive Engagement

The cognitive engagement captures students' investment of mental effort through critical thinking, perspective-taking, and the application of knowledge in real-world contexts. The data revealed that students demonstrated strong cognitive engagement throughout their participation in PBL activities. Many described these experiences as intellectually stimulating, particularly highlighting debates as opportunities to sharpen reasoning and argumentation skills. They consistently described debates as intellectually demanding activities that sharpened their reasoning and analytical skills, and this illustrates how structured argumentation encouraged evidence-based thinking and cognitive discipline. These experiences enabled students to transfer classroom learning into practical, professional contexts, reinforcing the relevance of cognitive engagement to future career readiness. As one participant (KI 18) reflected, "Debates forced me to rely on facts rather than emotions, sharpening my reasoning ability." The findings affirm that cognitive engagement through PBL not only deepens intellectual rigor but also equips students with transferable skills essential for navigating complex professional environments.

Agentic Engagement

The findings underscore students' sense of agency, demonstrated through self-regulated learning, proactive goal-setting, and the ability to transfer academic knowledge into real-world contexts. This dimension of engagement was reflected in patterns such as autonomous learning strategies, forward-looking mindsets, and the development of intellectual independence through practical application.

Students consistently recognized that PBL tasks contributed to their confidence and ability to work independently across academic and professional domains. It prepares students not just for grades—it prepares them to be an independent thinker and problem solver, noting that research proposals helped them develop transferable skills and

empowered them to form their own judgments. These insights highlight how PBL fosters intellectual independence and bridges academic learning with real-world application. Students show ownership of their learning by adhering to research principles and academic guidelines, self-regulated learning, as KI 11 highlighted, "This research proposal isn't just an academic exercise. It's a chance to develop skills that will be valuable in any career." These findings show that PBL cultivates a mindset of autonomy and lifelong learning, equipping students to navigate complex challenges with confidence and purpose.

Discussion

The findings of this study affirm the effectiveness of Project-Based Learning (PBL) techniques in enhancing student engagement across the four dimensions of behavioral, emotional, cognitive, and agentic engagement, thereby addressing the stated research objective. Quantitative results from the survey of 91 students revealed high mean scores across all engagement types ($M = 5.80–5.99$), indicating strong levels of agreement that PBL fosters participation, motivation, and ownership of learning. Paired samples t-tests further showed statistically significant differences ($p < 0.001$) across demographic variables such as gender, age, major, and degree, suggesting that while PBL is broadly effective, its influence may vary according to student characteristics.

Qualitative evidence from 20 semi-structured interviews enriched these findings and directly responded to the research question regarding the most positive factors of student engagement. Students identified teamwork, communication, and skill application as central to their behavioral engagement, while emotion regulation and value recognition emerged as critical for sustaining motivation and building confidence. Cognitive engagement was reflected in students' emphasis on critical thinking, perspective-taking, and the application of knowledge to real-world contexts, whereas agentic engagement was most strongly demonstrated through self-regulated learning, proactive goal-setting, and the pursuit of intellectual independence. These findings highlight emotional and agentic engagement as particularly influential in motivating students to persist and take ownership of their learning.

The results align closely with engagement theory (Reeve, 2012a; Anderman et al., 2012; Lowe & El Hakim, 2020), which conceptualizes engagement as a multidimensional construct. Consistent with prior studies (Kokotsaki et al., 2016, L. Guo et al., 2023), the study shows that PBL provides students with authentic learning experiences that enhance collaboration, deepen cognitive processing, and foster autonomy. Importantly, the identification of emotional and agentic engagement as the most positive factors underscores the transformative role of PBL in enabling students not only to participate actively but also to develop long-term dispositions toward independent and motivated learning. Thus, the research objective and question are both met: PBL is effective in enhancing student engagement, and its most positive impacts are evident in fostering emotional resilience and agentic agency.

5. Conclusion

This study examined the impact of Project-Based Learning (PBL) techniques on student engagement among undergraduates at ACLEDA University of Business, using a mixed-methods approach. The quantitative findings, derived from a structured survey of 91 students, revealed high levels of agreement across all four engagement dimensions—behavioral, emotional, cognitive, and agentic—measured using a 7-point Likert scale. Descriptive statistics showed mean scores ranging from 5.80 to 5.99, indicating strong student engagement. The qualitative data, collected through semi-structured interviews with 20 students, provided deeper insights into the nature of engagement. Behavioral engagement was reflected in students' active participation, teamwork, and communication during role-play interviews. Emotional engagement emerged through students' ability to regulate emotions, recognize the value of learning, and engage constructively in debates and group projects. Cognitive engagement was evident in students' critical thinking, perspective-taking, and application of knowledge through book reviews and debates. Agentic engagement was demonstrated through self-regulated learning, proactive goal-setting, and the real-world relevance of research proposals.

Together, these findings affirm the multidimensional nature of student engagement as conceptualized by Reeve (2012) and Fredricks and McColskey (2012), and highlight the pedagogical value of PBL in fostering not only academic involvement but also personal growth and professional readiness. The statistically significant differences across demographic groups underscore the importance of tailoring PBL strategies to diverse student needs. Future research should expand the sample size, incorporate longitudinal

designs, and explore the predictive relationship between engagement dimensions and academic performance to further validate and extend these findings.

Role-play interview, debate and research proposal are used across Finance and Banking and Accounting programs at both associate and bachelor degree levels to enhance students' academic and professional competencies. Specifically, role-play interviews were conducted as part of the final project in EMS 305: Employability Skills for Year 3, Semester 1 Bachelor of Accounting students; debate activities were integrated into PHI 104 for Batch 8, Year 1, Semester 1 students; and research proposals were developed in RES 307: Research Methods by Batch 6 students in Year 3, Semesters 1 and 2, as well as by Batch 8 students in Year 1, Semesters 1 and 2. These experiential tasks demonstrate strong relevance to student engagement and skill development, and should be considered for integration into other social science-related subjects across programs and extracurricular initiatives.

Limitations and suggestions for future research

This study collected data from a single institution—ACLEDA University of Business—focusing on student engagement across four dimensions of PBL: behavioral, emotional, cognitive, and agentic. Future research should expand engagement theory to Higher Education institutions across geography and exploring across four dimensions, and include digital and interdisciplinary projects, would clarify how students strengthen higher-order thinking, self-regulation, and proactive mindsets across varied contexts.

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