Problem-Based Learning and Critical Thinking Skills among Accountancy, Business, and Management Students

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ABSTRACT

Problem-based learning (PBL) is a teaching method that immerses students in solving real-world problems, with the goal of improving their critical thinking skills. While PBL has been shown to benefit students across various disciplines, its impact on the critical thinking skills of ABM students has not been extensively researched. This study aimed to explore the effectiveness of PBL in enhancing the critical thinking skills of ABM students. Using a descriptive-correlational design, data were collected from 300 ABM students through validated questionnaires. The results indicated that students who participated in PBL demonstrated significant improvements in their critical thinking abilities compared to those who did not. Specifically, PBL students exhibited stronger skills in problem identification, analysis, information evaluation, creative solution development, and decision-making. The findings suggest that PBL is an effective method for enhancing critical thinking skills in ABM students. The study recommends that schools invest in training teachers on the implementation of effective PBL strategies and develop PBL programs that align with the ABM curriculum. Additionally, future research should adopt a mixed-methods approach to better understand the nuanced effects of PBL on students' critical thinking development.

Keywords: descriptive-correlational design, problem-based learning, critical thinking skills, ABM students

INTRODUCTION

Critical thinking skills among students have become an increasing concern in education, occupying a central role in debates on teaching effectiveness and student learning (McPeck, 2016). Poor analytical skills, coupled with ineffective teaching strategies, hinder students' ability to understand complex accounting concepts (Adler & Milne, 2010).

This issue is not confined to a single region but is observed globally. In the United States, a study identified two major obstacles to the development of critical thinking: limited exposure to complex problem-solving tasks and insufficient opportunities for independent thought (Smith & Johnson, 2018). Similarly, research in Australia found that high school students struggle with problem-solving and decision-making, indicating deficiencies in critical thinking (Smith, 2023). In India, many students face challenges in applying critical thinking to real-world problems, further highlighting the widespread nature of this concern (Rao, 2019).

In the Philippines, the lack of critical thinking skills among students remains a pressing issue in education (Benedicto, 2022). Studies indicate that Filipino students particularly struggle with evaluating arguments, demonstrating low levels of critical thinking. Saputri et al. (2018) further reported that 42% of Filipino students exhibit insufficient critical thinking skills, emphasizing the need for targeted interventions.

Despite extensive research on critical thinking, a significant gap remains in understanding its specific impact on senior high school students. This gap highlights the urgency of developing and accessing strategies to foster critical thinking habits within this demographic. Addressing this issue is crucial for enhancing students' problem-solving abilities, decision-making skills, and overall academic success. Accordingly, this study aims to explore the critical thinking skills of senior high school students, identifying effective strategies for intervention and improvement.

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Significance of the Study

The researchers believe that this study, the impact of problem-based learning and critical thinking skills among Accountancy, Business, And Management (ABM) students, is relevant and important for the following people and individuals:

Department of Education (DepEd). The study may provide valuable insights for the Department of Education in developing and applying effective teaching strategies that promote critical thinking skills among ABM students. The results may influence actions regarding teacher professional development and curriculum changes.

Policy Makers. The study may inform policy decisions related to education, particularly in terms of curriculum development and teacher training. The findings may support the implementation of policies that prioritize the development of critical thinking skills among students.

Teachers. The study may offer teachers guidance on how to implement problem-based learning strategies in their classrooms. It can help them understand the key elements of effective problem-based learning and develop approaches to foster critical thinking among their students.

Students. The study may help students understand the benefits of problem-based learning and enhance their critical thinking skills. It can motivate them to actively engage in the learning process and develop essential skills for their future academic and professional endeavors.

Future Researchers. The study can serve as a reference for future research on the impact of problem-based learning on critical thinking skills. It may provide insights into potential research questions, strategies, and methodologies for further investigation.

Statement of the Problem

This study aimed to determine the significant relationship between problem-based learning and critical thinking skills among senior high school students. Specifically, it needed to answer the following question:

1. What is the level of problem-based learning of students in terms of:
    1. collaborative learning;
    2. active engagement; and
    3. self-directed learning?
2. What is the level of critical thinking skills of students in terms of:
    1. analysis
    2. evaluation; and
    3. decision-making?
3. Is there a significant relationship between problem-based learning and critical thinking skills among senior high school students.

Hypotheses

This study was tested at a 0.5 level of significance.

H_0: There is no significant relationship between problem-based learning and the critical thinking skills among senior high school students.

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H_a: There is no significant relationship between problem-based learning and the critical thinking skills among senior high school students.

REVIEW OF RELATED LITERATURE

This section presents a review of literature relevant to the study, focusing on problem-based learning, critical thinking skills, and their relationship. The selected studies provide significant insights into these topics and highlight their implications for student learning.

Problem-based Learning

Problem-based learning (PBL) is a student-centered approach where problems serve as the foundation for learning. Jonassen and Hung (2015) emphasized that PBL facilitates active engagement by allowing students to develop problem-solving skills in authentic contexts. Similarly, Yew and Goh (2016) found that PBL enables students to interact with meaningful challenges, fostering deeper understanding. Leming (2020) further noted that PBL encourages learners to apply knowledge rather than passively absorb facts, enhancing long-term skill development. Additionally, Loyans et al. (2015) highlighted that PBL supports independent learning by promoting information-seeking behaviors and application of knowledge in novel situations.

Collaborative Learning. Collaboration is an essential aspect of PBL. Rai (2024) described collaborative learning as a learner-centered approach in which students work together toward shared goals. Muntazhimah and Prabawanto (2020) observed that collaborative learning benefits students of varying performance levels by fostering group engagement and knowledge sharing. Aini et al. (2022) found that students perceive collaboration as advantageous, as it encourages discussion and deepens understanding. However, challenges such as low participation and motivation can hinder effectiveness. Huang and Lajoie (2023) emphasized the need for structured support to ensure active involvement and accountability. Additionally, Zhang et al. (2022) highlighted the importance of cognitive engagement in online collaborative learning to maximize its benefits.

Active Engagement. Active engagement involves students' sustained interest and cognitive involvement in learning tasks. Philp and Duchesne (2016) defined it as a combination of mental effort, focus, and participation. Cottafava, Cavaglià, and Corazza (2019) noted that actively engaged students develop skills beyond academic knowledge, such as adaptability and critical thinking. However, engagement strategies must align with individual learning styles to be effective (Good, Maries, & Singh, 2019). Understanding these variations can help educators optimize engagement techniques and improve learning outcomes.

Self-directed learning. Self-directed learning (SDL) is a crucial component of PBL. According to Denomme and Garland (2023), SDL allows students to take ownership of their learning by setting goals and managing their progress. Brandt (2020) emphasized that SDL fosters independence and lifelong learning skills. Research by Yurdal (2023) linked SDL to higher-order thinking and academic excellence, while Garrison and Archer (2015) suggested that SDL can be effectively integrated into both traditional and online learning environments when paired with experiential learning and technology.

Critical Thinking Skills

Critical thinking is the ability to analyze, evaluate, and synthesize information objectively. Boogaard (2024) described it as essential for making informed decisions and identifying misinformation. Harber (2020) reinforced its role in rational decision-making, while Larsson (2017) underscored its significance as a global educational priority. McPeck (2016) advocated for embedding critical thinking into curricula, arguing that it enhances problem-solving capabilities. Donohue and Muic (2019) suggested that integrating PBL with active participation can strengthen critical thinking by encouraging students to connect new knowledge with prior experiences and reflect on learning processes.

Analysis. Analysis is a key component of critical thinking. Stryker (2024) asserted that systematic analysis minimizes errors and enhances understanding. Inmon (2023) described it as breaking down complex information into fundamental elements to assess arguments critically. Knight (2023) emphasized the need for deep analysis to draw meaningful conclusions, thereby elevating the quality of reasoning and decision-making.

Evaluation. Evaluation involves assessing information to determine its validity and relevance. Karan (2024) defined it as a structured process of gathering and interpreting data to measure understanding. Thomas and Caluyua (2020) highlighted its role in assessing performance, while Bidyapati (2023) noted that systematic evaluation supports learning development. Li (2022) provided empirical evidence on the reliability of evaluation tools in measuring critical thinking, reinforcing its importance in educational settings.

Decision Making. Decision-making is an integral part of critical thinking. Laoyan (2024) described it as a process that involves gathering information, weighing options, and making informed choices. Nitta (2024) noted that different decision-making models can yield varying outcomes, while Musek (2017) linked decision-making styles to individual personality traits. Williamson (n.d.) emphasized that decision-making fosters independence, responsibility, and confidence, particularly among students learning to navigate complex problems.

Relationship between Problem-based Learning and Critical Thinking Skills

Numerous studies have examined the relationship between PBL and critical thinking. Thorndahl and Stentoft (2020) suggested that PBL serves as an effective strategy for fostering critical thinking skills. Razak et al. (2022) confirmed that PBL enhances students' ability to analyze and evaluate information. Rizqa (2016) noted that PBL encourages students to tackle open-ended problems, pushing them to think critically. Nadeak and Naibaho (2020) found that students guided by PBL demonstrated higher levels of critical thinking. Padmanabha (2021) argued that students who develop critical thinking skills through PBL can apply these abilities across disciplines. Hitchcock (2018) emphasized that "critical thinkers" exhibit a readiness to engage in complex reasoning tasks, reinforcing the importance of PBL as a tool for cultivating such skills.

Synthesis

The reviewed literature highlights the interplay between problem-based learning and critical thinking skills. The discussion covered key aspects of PBL, including collaborative learning, active engagement, and self-directed learning, all of which contribute to skill development. The literature also examined critical thinking through its core components: analysis, evaluation, and decision-making. Finally, research studies confirmed the strong relationship between PBL and critical thinking, demonstrating that PBL serves as an effective approach to enhancing students' reasoning abilities. These findings underscore the need for further research to refine PBL methodologies and maximize their impact on critical thinking development.

Conceptual Framework

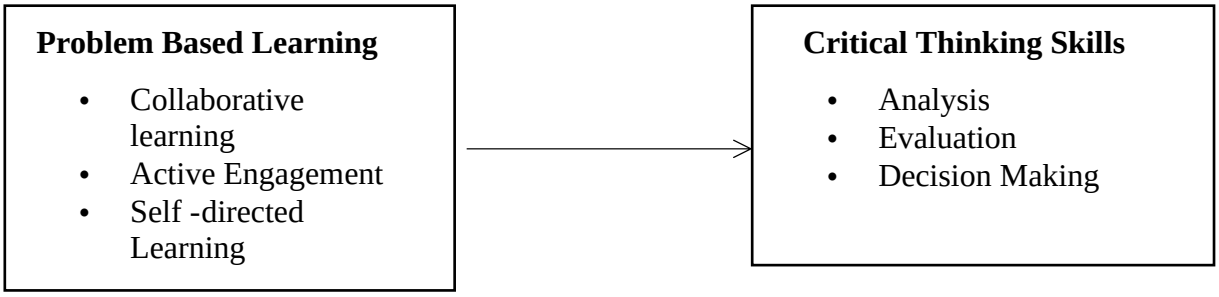

Figure 1: Conceptual Framework of the study

The independent variable is problem-based learning (PBL), which will be measured in terms of collaborative learning, active engagement, and self-directed learning. PBL is an instructional approach that uses problem cases as projects to help students develop their critical thinking abilities, enabling them to understand real-world issues (Heng et al., 2023). Collaborative learning allows learners to work together in a group to achieve the same objective while addressing various challenges (Hidayah et al., 2021). Active engagement refers to students giving their best effort to a task, focusing on it, and demonstrating interest (Goally, 2023). Self-directed learning is an approach in which the student takes responsibility for their own learning, actively setting goals and managing their educational journey (Denomme & Garland, 2023).

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The dependent variable is critical thinking skills, which include the following indicators: analysis, evaluation, and decision-making (Siswono, 2020; Facione, 2015). Critical thinking skills refer to the ability to analyze information objectively and make reasoned judgments. This involves evaluating sources such as data, facts, observable phenomena, and research findings (Doyle, 2024). Analysis involves a detailed examination of complex issues to understand their nature and determine essential features. According to Karan (2024), evaluation is the systematic process of gathering information about a person or an object from various sources to assess the subject's degree of competence or understanding. Decision-making is the process of identifying a decision, gathering relevant information, and evaluating alternative resolutions (Webster, 2024).

It is the contention of the framework that problem-based learning (PBL) may have a significant relationship with the critical thinking skills of students at Carlos P. Garcia Senior High School. The interplay between PBL and critical thinking skills is central to this relationship: collaborative learning within PBL fosters communication and teamwork, which can sharpen analytical skills; active engagement encourages deeper cognitive involvement, thereby enhancing evaluation capabilities; and self-directed learning supports independent decision-making and reflective thinking. Thus, each component of PBL is expected to reinforce different aspects of critical thinking, creating a dynamic and interconnected relationship between the two variables.

METHODOLOGY

Research Design

The researchers utilized a non-experimental quantitative approach to gather relevant data and information. According to a source from the University of Minnesota (2016), non-experimental research is research that lacks the manipulation of an independent variable, control of extraneous variables through random assignment, or both. Rather than manipulating an independent variable, researchers conducting non-experimental research simply measured variables as they naturally occurred. Furthermore, as cited by Creswell, J. W. (2018), many variables of interest in the field of social science could not be controlled or manipulated because they are attribute variables. Non-experimental research is best suited for situations where researchers want to observe events that have already happened, and the versatility of the model could be used to observe many unique phenomena (Adam R., 2024).

This study used a descriptive-correlational research design. According to McCombes (2019), descriptive research is a type of research used to describe the characteristics of a population. It collects data that are used to answer a wide range of what, when, and how questions related to a particular population or group. Additionally, as cited by Taylor (2024) defined correlation as a statistical measure of the relationship between two variables. Moreover, descriptive-correlational research is a type of research design that explains the relationship between two or more variables without making claims about cause and effect. It allowed researchers to describe variables in detail and investigate their relationships without suggesting that one variable caused another (Bhat, n.d.).

Research Locale

The study was conducted at Carlos P. Garcia Senior High School, located at Juan Luna St., Poblacion District, Davao City, Philippines. The chosen respondents were the students of Carlos P. Garcia Senior High School, as they were enrolled in programs that provide learners with essential skills in business. Davao City was selected as the study location due to the significant number of enrolled Accountancy, Business, and Management (ABM) students, particularly in accounting, finance, and management. Additionally, Davao City is an excellent, highly sophisticated city in the Davao Region. It is also the largest city in the Philippines in terms of land area. As Mindanao's most outstanding economic center, the city has the primary local economy in the southern Philippines.

Research Respondents

In this study, the respondents were the Accountancy, Business, and Management (ABM) students at Carlos P. Garcia Senior High School, Davao City. The researcher chose this strand for the study because ABM students are regularly exposed to problem-based learning (PBL) and need to be aware of the level of their critical thinking skills.

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Sampling Design

This study used a simple random sampling design with 300 respondents. In this method, every individual within the defined population had an equal chance of being selected for the sample, ensuring unbiased data collection and analysis. According to Raghunath Arnab (2017), simple random sampling helps to avoid sampling bias by giving all members of the population an equal opportunity to be included in the study. The researchers calculated the sample size required for the study using Slovin's formula.

Research Instrument

The independent variable and dependent variable of this study were measured using two instruments: the problem-based learning questionnaire, which consisted of three (3) domains—collaborative learning, active engagement, and self-directed learning—and the critical thinking skills instrument, which consisted of three (3) domains—analysis, evaluation, and decision-making.

For validation, the survey questionnaire was forwarded to experts. A validation sheet was used by the experts to rate the survey questionnaire. All of the experts' opinions and recommendations were followed. After the validity test, the survey questionnaire was piloted to thirty (30) students from the Accountancy, Business, and Management strand. Cronbach's alpha was used to assess its reliability. According to Frost (2024), Cronbach's alpha coefficient measures the internal consistency, or reliability, of a set of survey items.
Problem-based learning. The items for problem-based learning were adopted, but the statements were created by the researchers using a 5-point scale that focused on a detailed evaluation of the construct of problem-based learning in terms of collaborative learning, active engagement, and self-directed learning. The rating scale for this attribute was as follows:

Range of Mean	Description	Interpretation
4.21 - 5.00	Very High	This means that Problem-Based Learning among ABM students is always demonstrated.
3.41 - 4.20	High	This means that Problem-Based Learning among ABM students is sometimes demonstrated.
2.61 - 3.40	Moderate	This means that Problem-Based Learning among ABM students is demonstrated.
1.81 - 2.60	Low	This means that Problem-Based Learning among ABM students is rarely demonstrated.
1.00 - 1.80	Very Low	This means that Problem-Based Learning among ABM students is never demonstrated.

Critical thinking skills. The items for critical thinking skills were adopted, with the statements created by the researchers using a 5-point scale that focuses on a detailed evaluation of the construct of critical thinking skills in terms of analysis, evaluation, and decision-making. The following is the rating scale that was used.

Range of Mean	Description	Interpretation
4.21 - 5.00	Very High	This means that the Critical Thinking Skills among ABM students are always demonstrated.
3.41 - 4.20	High	This means that the Critical Thinking Skills among ABM students are sometimes demonstrated.
2.61 - 3.40	Moderate	This means that the Critical Thinking Skills among ABM students are demonstrated.

1.81 - 2.60	Low	This means that the Critical Thinking Skills among ABM students are rarely demonstrated.
1.00 - 1.80	Very Low	This means that the Critical Thinking Skills among ABM students are never demonstrated.

Ethical Considerations

Ethical considerations played an important role in ensuring the honesty and legitimacy of the research, especially when dealing with sensitive topics such as the critical thinking skills of students. This study followed ethical guidelines governed by four essential elements:

Social Values. The research aimed to contribute to the social understanding of problem-based learning and the critical thinking skills of senior high school students. By investigating these factors, the study sought to determine the impact of problem-based learning on students' critical thinking skills among ABM students. Students benefited by promoting the development of critical thinking skills, problem-solving abilities, and communication skills.

Informed Consent. Prior to data collection, informed consent was obtained from all respondents. Respondents were provided with clear information about the study's purpose, procedures, potential risks and benefits, confidentiality measures, and the right to withdraw at any time without consequences. Only those who provided voluntary consent participated in the survey, ensuring ethical guidelines of voluntary participation and respect for personal privacy.

Risks, benefits, and safety. The study recognized potential risks, such as discomfort or privacy violations related to discussing personal problem-solving strategies. To reduce these risks, confidentiality measures were strictly followed, ensuring that respondent identities and responses remained anonymous and secure. The safety of respondents was a primary concern; therefore, any distress or discomfort was addressed promptly, and they had access to support resources if needed. Benefits included the opportunity for students to reflect on their critical thinking processes and potentially improve their problem-solving skills through increased awareness and targeted educational initiatives.

Privacy and Confidentiality of Information. This study complied with the Data Privacy Act of 2012, which protected the rights of individuals concerning the handling of personal data. The data collected was stored securely and accessed only by the authorized researchers involved. Privacy was maintained throughout the study, and results were presented in summary form to ensure that no individual students were identified.

Data Gathering Procedure

The following steps were strictly followed in conducting the study:

Permission to Conduct the Study. To begin the process, the researcher addressed a letter of approval to the school principal of Carlos P. Garcia Senior High School, informing them about the study, the respondents, and the study's objectives. Afterward, the researcher informed the class advisers about conducting the study in their respective sections.

Distribution and Retrieval of Informed Consent. The researchers provided the respondents with the questionnaire upon distribution and retrieval of the request letter. In the first meeting with the respondents, the researchers provided a thorough summary of the study and discussed the significance of their participation and answers to the questionnaire. To ensure that the questionnaires were properly filled out, the researchers personally monitored the respondents while they completed them. The respondents were informed that their participation was voluntary and assured that they would remain anonymous throughout the study. Furthermore, the respondents answered the survey questionnaires by checking or marking the desired box that corresponded to their level of student engagement and critical thinking skills for each item.

Collation and Statistical Treatment of the Study. After all the responses were retrieved and the data collected, the

researchers encoded them in Microsoft Word. The data was statistically organized and interpreted according to the domains of the study.

Data Analysis

The researcher used several statistical tools to analyze the respondents' responses, including the mean and Pearson product-moment correlation coefficient. Each tool provided unique insights into the data and helped interpret the relationship among the study variables comprehensively.

Mean. This was used to determine the sum of all the values in the data set divided by the number of values. Specifically, it was used to determine the level of problem-based learning and critical thinking skills of students. By calculating the mean, the researchers gauged the central tendency of the dataset, offering valuable insights into the overall problem-solving skills and knowledge levels of students.

Pearson's Correlation. Pearson's correlation coefficient was used to assess the strength and direction of the linear relationship between problem-based learning and critical thinking skills of students. The coefficient provided a value ranging from -1 to 1, where values closer to 1 indicated a strong positive correlation, values closer to -1 represented a strong negative correlation, and values near 0 suggested little to no relationship between the two variables. This statistical method helped the researchers examine how changes in one variable (problem-based learning) were related to changes in the other variable (critical thinking skills). By interpreting the correlation coefficient, the researchers were able to determine the degree of influence problem-based learning had on students' critical thinking abilities.

RESULTS AND DISCUSSION

Level of Problem-Based Learning

Presented in Table 1 is the level of problem-Based Learning in terms of Collaborative Learning, Active Engagement, and Self-Directed Learning.

Table 1. Level of Problem-based Learning of Accountancy, Business, and Management Students.

Domains of Financial Support	SD	Mean	Descriptive Level
Collaborative Learning	0.537	4.27	Very High
Active engagement	0.510	4.25	Very High
Self-directed learning	0.419	4.27	Very High
OVERALL	**0.425**	**4.26**	**Very High**

The table indicates that the overall mean value of problem-based learning is 4.26, categorized as very high. This suggests that problem-based learning is consistently manifested among students. These findings highlight the effectiveness of problem-based learning strategies in fostering collaborative learning, active engagement, and self-directed learning. This aligns with Rosenbaum (2015), who found that problem-based learning enables students to apply knowledge to complex problems, thereby enhancing their learning experience. However, this contradicts the findings of Rebecca (2022), who observed that while students benefit from problem-based learning in terms of knowledge acquisition, they often struggle to apply these strategies to real-world challenges, which may impact their overall educational outcomes.

Among the three domains, collaborative learning achieved the highest mean value of 4.27, also categorized as very high. This indicates that collaborative learning is consistently practiced among ABM students, underscoring its importance in their academic experience. The results suggest that accounting, business, and management students place significant value on collaborative learning, actively engaging in peer interactions and knowledge-sharing. This is supported by Andreev (2022), who found that students who participate in collaborative learning activities tend to achieve higher levels of academic performance, critical thinking skills, and problem-solving

abilities. Similarly, Nguyen (2020) reported that students who worked cooperatively in small groups performed better on assessments compared to those who studied individually. Furthermore, research has shown that collaborative learning enhances students' attitudes toward learning and increases their motivation. However, its effectiveness is not universal; as noted by Irzawati (2023), some students struggle with group work, and certain groups may lack organization or productivity, which can hinder learning outcomes.

Following collaborative learning, self-directed learning also recorded a high mean value of 4.27, indicating that it is consistently exhibited among students. This is particularly evident in how ABM learners independently identify learning goals, plan their learning strategies, and monitor their own progress. These findings suggest that educational policies should acknowledge students with high levels of self-directed learning, recognizing their capacity to take ownership of their education and adapt their strategies to meet individual needs. Denomme and Garland (2023) emphasized the importance of learners taking initiative in their education, particularly in adult learning contexts. Similarly, Robinson and Persky (2020) found that students who actively monitor and manage their learning experiences tend to achieve higher levels of academic success. However, Cortes (2024) cautioned that self-directed learning can sometimes lead to inefficiencies or mistakes if students lack proper guidance or support.

Despite its high rating, active engagement had the lowest mean value among the three domains, with a score of 4.25, still categorized as very high. This suggests that while ABM students exhibit strong active engagement, it is relatively lower compared to their collaborative and self-directed learning skills. The findings indicate that students may require additional encouragement to fully participate in learning activities. Although students demonstrate a willingness to engage, they may need greater motivation or support to sustain their involvement. To address this, teachers could integrate engagement-building strategies into their curriculum, such as interactive activities, opportunities for student choice, and positive reinforcement that acknowledges active participation. Research supports this approach, with Rolljak (2023) emphasizing the role of active engagement in student learning success. Similarly, Luborsky (2023) found that although ABM students are generally engaged, they may still require additional support to participate fully in learning activities. These findings align with Brown and Davis (2021), who highlighted the need for targeted encouragement to promote active classroom participation. Additionally, Koblyakov (2024) suggested that incorporating interactive activities, such as group discussions and hands-on projects, can significantly enhance student motivation and engagement.

Level of Critical Thinking Skills

Presented in Table 2 is the level of critical thinking skills in terms of analysis, evaluation, and decision-making.

Table 2. Level of Critical thinking Skills of Accountancy, Business, and Management Students

Domains of Financial Support	SD	Mean	Descriptive Level
Analysis	0.602	4.09	High
Evaluation	0.470	4.28	Very High
Decision-Making	0.484	4.23	Very High
OVERALL	**0.455**	**4.20**	**High**

The table reveals that the overall mean value of critical thinking skills is 4.20, which is described as high, indicating that students sometimes manifest critical thinking skills. This suggests that ABM students can analyze information, assess its credibility, and make informed decisions, demonstrating their preparedness for problem-solving and analytical tasks.

These findings align with the study of Sari et al. (2021), which emphasizes that integrating critical thinking instruction into structured synchronous learning environments can help students develop their analytical abilities. However, Sari and Aminatun (2021) found that many students exhibit low levels of critical thinking due to limited exposure to problem-based learning environments, which restricts their ability to engage with real-world challenges. Additionally, Oliveira et al. (2016) highlighted that innovative teaching methods, such as problem-

based learning, can enhance students' critical thinking skills.

Among the three domains, evaluation obtained the highest mean value (M = 4.28, very high), indicating that it is consistently demonstrated by ABM learners. This is particularly evident in their ability to critically assess complex situations and make sound judgments. These results suggest that educational policies should further strengthen and support evaluation skills, as this competence significantly contributes to students' academic success and overall development.

Shi (2023) supports this finding, discussing how integrating machine learning frameworks in educational assessments can enhance evaluation processes and outcomes. However, Bidya (2023) notes that the fear of negative evaluation can discourage students from actively engaging in assessment activities, potentially affecting their performance and self-esteem. Despite these challenges, effective evaluation remains a crucial component of learning.

Following evaluation, decision-making achieved a mean value of 4.23, also described as very high, indicating that it is consistently demonstrated. ABM students exhibit strong decision-making skills, as they take time to compare actual outcomes with expected results and carefully assess complex situations before making choices. Given this, educational policies should acknowledge students with strong decision-making abilities and provide opportunities to further develop these skills in academic and business-related contexts.

This aligns with the study of Zhang et al. (2021), which emphasizes the importance of encouraging creativity and originality in decision-making, particularly in dynamic business environments. However, research by Port and Wilf (2019) highlights a potential drawback—complex decision-making can lead to the misestimation of risks, as observed in NASA mission failures, where decision-makers struggled to accurately assess risks due to information overload and external pressures. Laoyan (2024) further explains that effective decision-making involves systematically gathering information, evaluating alternatives, and arriving at a well-informed choice.

Among the three domains, analysis had the lowest mean value (M = 4.09, high), meaning that it is sometimes demonstrated. While ABM learners generally possess strong analytical skills, the findings suggest that their confidence in their analytical abilities may be lower than their actual competencies. This indicates that while they can analyze problems effectively, they may experience self-doubt or require additional support to refine their analytical approach.

Knight (2023) highlights that deepening one's analysis enhances critical thinking by encouraging more insightful and meaningful conclusions. However, Wilding (2024) warns that overanalyzing can lead to self-doubt and decision paralysis, where individuals become so fixated on analyzing a situation that they struggle to make decisions. Stryker (2024) also notes that consistent analytical processes help reduce errors and improve overall quality.

Overall, while ABM students demonstrate strong evaluation, decision-making, and analytical skills, the findings suggest that additional support in analytical confidence and risk assessment may further enhance their critical thinking competencies.

Significance of the Relationship Between Problem-Based Learning and Critical Thinking Skills

Table 3 presents the relationship between problem-based learning and critical thinking skills.

Table 3. Significance of the relationship between problem-based learning and critical thinking skills

	Critical Thinking Skills				
	r	**r^2**	**p-value**	**Decision on H_0 @ 0.05 level of significance**	**Interpretation**
Problem-Based Learning	.777	.603	.000	Reject H_0	Significant

Table 3 reveals a significant relationship between problem-based learning (PBL) and critical thinking skills. The analysis yielded a p-value of 0.000, indicating statistical significance at the 0.05 level. Furthermore, the computed r-value of 0.777 suggests a strong positive correlation between the two variables. This means that as students engage more in problem-based learning, their critical thinking skills tend to improve. Additionally, the coefficient of determination ($r^2 = 0.603$) indicates that 60.3% of the variance in critical thinking skills can be attributed to problem-based learning, while the remaining 39.7% may be influenced by other factors.

These results suggest that students with greater exposure to problem-based learning are more likely to develop higher critical thinking skills. Consequently, enhancing learners' engagement in problem-based activities could significantly strengthen their ability to analyze, evaluate, and make informed decisions. This finding underscores the importance of integrating problem-based learning in ABM education, as it fosters students' critical thinking readiness and prepares them for real-world business challenges.

The results are consistent with Nadeak and Naibaho (2020), who found that problem-based learning enhances students' critical thinking skills and recommended its adoption in classroom instruction. Similarly, Lapuz and Fulgencio (2020) confirmed that PBL effectively improves students' critical thinking abilities, as reflected in their study findings. Furthermore, Wahyu et al. (2017) demonstrated that students taught using the PBL model exhibited greater gains in critical thinking compared to those who underwent conventional learning approaches.

Dr. Padmanabha (2018) highlighted that students who develop strong critical thinking skills through PBL can transfer these abilities across different subjects and disciplines. Since critical thinking encompasses reasoning, problem-solving, and evaluation, reinforcing these skills leads to more effective decision-making and analytical proficiency. In line with this, Achilov (2017) emphasized that educating future professionals with broad perspectives and strong analytical abilities requires instructional strategies that actively engage students in critical thinking. Thus, teachers who observe students struggling with analytical, evaluative, or decision-making skills should implement problem-based learning to enhance their cognitive development.

Overall, the findings strongly support the integration of problem-based learning as a fundamental approach to developing critical thinking skills among ABM students, equipping them with essential competencies for both academic and professional success.

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the conclusions that were drawn from the findings of the study. This section further offers recommendations as to how the findings of this study can improve practice.

This study aimed to determine the extent of problem based learning and critical thinking skills among ABM student in Carlos P. Garcia Senior High School.

Specifically, this study sought to determine if a relationship exists between problem based learning and critical thinking skills of ABM students in Carlos P. Garcia Senior High School, as well as the degree of their relationship.

This study utilized the descriptive-correlational design to determine the extent of problem based learning and critical thinking skills of ABM students and if they are significantly related. The respondents of this study were three hundred (300) ABM students of Carlos P. Garcia Senior High School in Davao City using a complete enumeration sampling design. The respondents used researchers-made survey questionnaires to collect the necessary information. Data collection involved strict compliance of ethical considerations. Mean and Pearson's r were used to analyze the data that had been collected.

Conclusion

Based on the findings of the study, the following conclusions are drawn by the researchers:

The effectiveness of problem-based learning (PBL) in enhancing the learning outcomes of ABM students is highly manifested. Although PBL has shown significant benefits in improving student engagement and academic

performance, there is still a need to keep improving how it's done to make it better.

The development of critical thinking skills among ABM students through PBL is highly evident. Though the students have demonstrated a high level of critical thinking abilities, there is still a requirement to observe and clarify these skills further to ensure they are put to good use in various academic and professional settings.

The extent of critical thinking skills development among ABM students using PBL would depend on the effectiveness of the PBL approach. It is evident that when PBL is implemented successfully, it significantly influences the enhancement of critical thinking skills, which is a crucial for doing well in academic and professional success in fields.

Recommendations

Based on the findings of this study, it is recommended that schools implement comprehensive training programs for teachers to equip them with effective problem-based learning (PBL) strategies. These strategies should be tailored to the specific needs of the ABM curriculum to ensure that students are exposed to real-world problems that align with their academic and professional interests. Furthermore, educational institutions should create and promote student-centered learning environments that foster collaboration, active engagement, and self-directed learning. In addition, students should be encouraged to reflect on their PBL experiences, enhancing their self-awareness and allowing them to better understand their critical thinking processes. Incorporating a mixed-methods approach into future studies would provide a more comprehensive understanding of how PBL impacts critical thinking. By combining quantitative data with qualitative feedback from students and teachers, researchers can gain deeper insights into the specific elements of PBL that most effectively enhance critical thinking skills. This holistic approach will provide valuable guidance for further refining PBL strategies and ensuring that critical thinking development remains a central goal within the ABM curriculum.

REFERENCES

1. Adler, R., & Milne, M. (2010). Improving the quality of accounting students' learning through action-oriented learning tasks. Accounting Education: An International Journal, 6(2), 191–215. https://doi.org/10.1080/096392897331442
2. Aini, F., Amin, M., & Saputra, A. (2022, December). Students' perceptions toward collaborative learning strategy for overcoming speaking anxiety among students of an Islamic senior school. Journal of English Education Forum (JEEF), 2(2), 1-5.
3. Anazifa, R. D. (2016). The effect of problem-based learning on critical thinking skills and student achievement. In Proceeding of the 3rd International Conference on Research, Implementation and Education of Mathematics and Science (pp. 43-48).
4. Awang, M., Ahmad, A., Yakub, N., & Seman, A. (2016). Historical thinking skills among pre-service teachers in Indonesia and Malaysia. Creative Education, 7, 62-76. https://doi.org/10.4236/ce.2016.71007.
5. Benedicto, P. N., & Andrade, R. (2022). Problem-based learning strategies and critical thinking skills among pre-service teachers. International Journal of Science, Technology, Engineering and Mathematics, 2(2).
6. Bidyapati. (2023). Designing for teaching-learning evaluation. Retrieved from https://bidyapatibedstudy.wordpress.com/category/b-ed-1st-year-assignment/
7. Bhat. (2023). Descriptive correlation. Studocu. Retrieved from https://www.studocu.com
8. Boland, L. M., & Hester, L. L. (2022). Taking teaching and learning seriously: Approaching wicked consciousness through collaboration and partnership. To Improve the Academy, 41(1). https://doi.org/10.3998/tia.453
9. Boogaard, A. (2024). A systematic literature review of research trends on critical thinking skills. SHS Web of Conferences, 82, Article 01002. https://doi.org/10.1051/shsconf/20248201002
10. Bestlink College of the Philippines. (2019–2020). Ascendens Asia Singapore – Bestlink College of the Philippines Journal of Multidisciplinary Research, 2(1). Retrieved from https://ojs.aaresearchindex.com/index.php/aasgbcpjmra/article/view/1290
11. Brandt, W. C. (2020). Measuring student success skills: A review of the literature on self-directed learning. 21st Century Success Skills. National Center for the Improvement of Educational Assessment.

12. CFI. (n.d.). Correlation of PMP and CFI changes. Plotted values are the differences. Retrieved from https://www.researchgate.net
13. Creswell, J. W., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Sage.
14. Critical and Creative Thinking. (n.d.). Australian Curriculum. Retrieved from https://www.australiancurriculum.edu.au/f-0-curriculum/general-capabilities/critical-and-creative-thinking/
15. Dario Cottafava, Gabriela Cavaglià, & Laura Corazza. (2019). Education of sustainable development goals through students' active engagement: A transformative learning experience. Sustainability Accounting, Management and Policy Journal.
16. Dennome, D., & Garland, W. (2023). Self-directed learning: Overview, strategies & examples. Study.com. Retrieved from https://study.com/learn/lesson/self-directed-learning-overview-strategies.html
17. Desak Made Anggraeni, B., Kurnia Prahani, B., Suprapto, N., Shofiyah, N., & Jatmiko, B. (2023). Systematic review of problem-based learning research in fostering critical thinking skills. Thinking Skills and Creativity, 49, 101334. https://doi.org/10.1016/j.tsc.2023.101334
18. Yew, E. H. J., & Goh, K. (2016). Problem-based learning: An overview of its process and impact on learning. Higher Education, 72(5), 613-628. https://doi.org/10.1016/j.hpe.2016.01.004
19. Fadilla, N., Nurlaela, L., Rijanto, T., Ariyanto, S. R., Rahmah, L., & Huda, S. (2021, March). Effect of problem-based learning on critical thinking skills. In Journal of Physics: Conference Series (Vol. 1810, No. 1, p. 012060). IOP Publishing.
20. Facione, P. (2015). Critical Thinking: What It Is and Why It Counts. Measured Reasons LLC. Retrieved from https://www.measuredreasons.com
21. Goally Apps. (2023). What is active engagement? Goally. Retrieved from https://getgoally.com/blog/neurodiversopedia/what-is-active-engagement/
22. Hidayah, R., Fajaroh, F., & Narestifuri, R. E. (2021). Pengembangan model pembelajaran collaborative problem-based learning pada pembelajaran kimia di perguruan tinggi. QALAMUNA: Journal Pendidikan, Social, Dan Agama, 13(2), 503-520. https://www.researchgate.net/publication/355005884_Collaborative_Problem_Based_Learning_Model_for_Creative_Thinking_Ability
23. Heng, K., Sol, K., & Pang, S. (2023). Challenges and opportunities of online learning: Insights from Cambodian higher education during Covid-19. Issues in Educational Research, 33(2), 608-630.
24. Huang, X., & Lajoie, S. P. (2023). Social emotional interaction in collaborative learning: Why it matters and how can we measure it? Social Sciences & Humanities Open, 7(1), 100447. https://doi.org/10.1016/j.ssaho.2023.100447
25. Irzawati, I., Raharjo, Y. M. R. D., & Hasan, T. (2023). Designing coursebook for university students: English for collegians. Journal of English Education Study Programme, 6(1), 151-162.
26. Inmon, B. (2023, April 2). Research vs analysis: What's the difference and why it matters. Integrate.io. Retrieved from https://www.integrate.io/blog/research-vs-analysis/
27. Philp, J., & Duchesne, S. (2016). Annual review of applied linguistics. Annual Review of Applied Linguistics, 36, 50-72. https://doi.org/10.1017/S0267190515000094
28. Jonassen, D. H., & Hung, W. (2015). Essential readings in problem-based learning. Google Books. Retrieved from https://books.google.com.ph/books?hl=en&lr=&id=fF7yDwAAQBAJ&oi=fnd&pg=PA17&dq=info:ocuXMUkTTP8J:scholar.google.com/
29. Karan, R. (2024). Difference between assessment and evaluation. Shiksha. Retrieved from https://www.shiksha.com/online-courses/articles/difference-between-assessment-and-evaluation/
30. Knight, J. (2023). Knowledge diplomacy: A conceptual analysis. In The Palgrave handbook of diplomatic reform and innovation (pp. 59-80). Cham: Springer International Publishing.
31. Khusna, A. H., Siswono, T. Y. E., & Wijayanti, P. (2024). Mathematical problem design to explore students' critical thinking skills in collaborative problem solving.
32. Kumar, R. (2019). Research methodology: A step-by-step guide for beginners. SAGE Publications. Retrieved from http://digital.casalini.it/9781526457080
33. Laoyan, S. (2024, January 17). 7 important steps of the decision-making process [2024]. Retrieved from [link]

34. Larsson, K. (2017). Understanding and teaching critical thinking—a new approach. International Journal of Educational Research, 86, 27-39. https://doi.org/10.1016/j.ijer.2017.05.004
35. Lapuz, A. M. E., & Fulgencio, M. N. (2020). Improving the critical thinking skills of secondary school students using problem-based learning. International Journal of Academic Multidisciplinary Research, 4(1), 1-7. Retrieved from https://ssrn.com/abstract=3543211
36. Leming, M. (2020). What is problem-based learning? The Hun School of Princeton. Retrieved from https://www.hunschool.org/resources/problem-based-learning
37. Leonard, J. (2018). Culturally specific pedagogy in the mathematics classroom. In Routledge eBooks. https://doi.org/10.4324/9781351255837
38. Liu, Y., Zhang, X., Kang, Y., Li, L., Chen, T., Hong, M., & Yang, Q. (2022). Fedbcd: A communication-efficient collaborative learning framework for distributed features. IEEE Transactions on Signal Processing, 70, 4277-4290.
39. Li, S., Tang, S., Geng, X., & Liu, Q. (2022). Constructing a critical thinking evaluation framework for college students majoring in the humanities. Frontiers in Psychology, 13, 1017885. https://doi.org/10.3389/fpsyg.2022.1017885
40. Loyens, S. M., Jones, S. H., Mikkers, J., & van Gog, T. (2015). Problem-based learning as a facilitator of conceptual change. Learning and Instruction, 38, 34-42.
41. Matulewicz, A. T., Hammond, V., Patterson, J. A., Frankart, L. M., & Donohoe, K. (2020). Utilizing widely available podcasts to create a reflection activity for pharmacy students. Currents in Pharmacy Teaching and Learning, 12(10), 1215-1223.
42. Marquez, L. (2017). Critical thinking in Philippines education: What we have and what we need. ResearchGate. Retrieved from https://www.researchgate.net/publication/320551159
43. McCombes, S. (2019). Descriptive research: Definition, types, methods & examples. Scribbr. Retrieved from https://www.scribbr.com/methodology/descriptive-research/
44. McPeck, J. E. (1981). Critical thinking and education (1st ed.). Routledge. https://doi.org/10.4324/9781315463698
45. Good, M., Maries, A., & Singh, C. (2019). Impact of traditional or evidence-based active-engagement instruction on introductory female and male students' attitudes and approaches to physics problem solving. Physical Review Physics Education Research, 15, 020129. https://doi.org/10.1103/PhysRevPhysEducRes.15.020129
46. Muntazhimah, T., & Ranawat, S. (2020, July). How to apply metacognitive strategies in a collaborative learning setting? In MSCEIS 2019: Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar, MSCEIS 2019, 12 October 2019, Bandung, West Java, Indonesia (p. 216). European Alliance for Innovation.
47. Musek, J. (2024). Personality psychology: A new perspective. Springer Nature.
48. Minnesota. (2016). Overview of nonexperimental research. University of Minnesota Twin Cities. Retrieved from https://open.lib.umn.edu
49. Nadeak, B., & Naibaho, L. (2020). The effectiveness of problem-based learning on students' critical thinking. Journal Dinamika Pendidikan, 13(1), 1-7.
50. Nitta, K. (2024, July 20). Decision making: Problem solving, cognitive processes & strategies. Encyclopedia Britannica. Retrieved from https://www.britannica.com/topic/decision-making
51. Obadiora, A. J. (2016). Comparative effectiveness of the recommended instructional strategies on students' environmental knowledge in social studies in Osun State middle schools. Journal of Educational and Social Research, 6.
52. Plummer, K. J., Kebritchi, M., Leary, H. M., & Halverson, D. M. (2022). Enhancing critical thinking skills through decision-based learning. Innovative Higher Education, 47(4), 711–734. https://doi.org/10.1007/s10755-022-09595-9
53. Padmanabha, C. H. (2018). Critical thinking: Conceptual framework. Journal on Educational Psychology, 11(4), 45-53.
54. Hitchcock, D. (2024). Critical thinking. In E. N. Zalta & U. Nodelman (Eds.), The Stanford Encyclopedia of Philosophy (Summer 2024 Edition). Retrieved from https://plato.stanford.edu/archives/sum2024/entries/critical-thinking/
55. Rai, H. (2024). Role of collaborative learning for developing speaking skills of secondary level students. Gipan, 6(1), 71-79.

56. Razak, A. A., Ramdan, M. R., Mahjom, N., Zabit, M. N. M., Muhammad, F., Hussin, M. Y. M., & Abdullah, N. L. (2022). Improving critical thinking skills in teaching through problem-based learning for students: A scoping review. International Journal of Learning, Teaching and Educational Research, 21(2), 342-362.
57. Saputri, A. C., Sajidan, N., & Rinanto, Y. (2018). Critical thinking skills profile of senior high school students in biology learning. Journal of Physics Conference Series, 1006, 012002. https://doi.org/10.1088/1742-6596/1006/1/012002
58. Sellars, M., Fakirmohammad, R., Bui, L., Fishetti, J., Niyozov, S., Reynolds, R., Thapliyal, N., Liu-Smith, Y., & Ali, N. (2018). Conversations on critical thinking: Can critical thinking find its way forward as the skill set and mindset of the century? Education Sciences, 8(4), 205. https://doi.org/10.3390/educsci8040205
59. Smith, A. H., Grupp, L. L., Doukopoulos, L., Foo, J. C., Rodriguez, B. J., Seeley, J., Boland, L. M., & Hester, L. L. (2022). Taking teaching and learning seriously: Approaching wicked consciousness through collaboration and partnership. To Improve the Academy: A Journal of Educational Development, 41(1). https://doi.org/10.3998/tia.453
60. Smith, A. H., & Johnson, [Initials]. (2018). Enabling critical thinking development in higher education through the use of a structured planning tool. Irish Educational Studies, 42(4), 949–969. https://doi.org/10.1080/03323315.2023.2258497
61. Stryker, C. (2024). Process analysis. IBM. Retrieved from https://www.ibm.com/think/topics/process-analysis
62. Taylor, S. (2023, November 21). Correlation. Corporate Finance Institute. Retrieved from https://corporatefinanceinstitute.com/resources/data-science/correlation/
63. Thorndahl, K. L., & Stentoft, D. (2020). Thinking critically about critical thinking and problem-based learning in higher education: A scoping review. Interdisciplinary Journal of Problem-Based Learning, 14(1).
64. Thomas De Aquino, & Caluyua Yambi, C. (2020). Assessment and evaluation in education. Retrieved from https://www.researchgate.net/publication/342918149_ASSESSMENT_AND_EVALUATION_IN_EDUCATION
65. Webster, M. (2024). Analysis and decision making: Definition & meaning. Merriam-Webster. Retrieved from https://www.merriam-webster.com/dictionary/decision-making
66. Wahyu, E. S., Sahyar, E. M. G., & Ginting, E. M. (2017). The effect of problem-based learning (PBL) model toward student's critical thinking and problem-solving ability in senior high school. American Journal of Educational Research, 5(6), 633-638.
67. Yew, E. H., & Goh, K. (2016). Problem-based learning: An overview of its process and impact on learning. Health Professions Education, 2(2), 75–79. https://doi.org/10.1016/j.hpe.2016.01.004
68. Yurdal, M. O., & Toraman, Ç. (n.d.). Self-directed learning, academic achievement and motivation: A meta-analytical study.
69. Zhang, C., Zhang, Z., Yang, D., Ashourizadeh, S., & Li, L. (2021). When cognitive proximity leads to higher evaluation decision quality: A study of public funding allocation. Frontiers in Psychology, 12, 697989. https://doi.org/10.3389/fpsyg.2021.697989