Journal of Information Systems Engineering and Management
2025, 10(35s)

e-ISSN: 2468-4376

https://www.jisem-journal.com/

Research Article

Teaching Approaches for the Development of Critical Thinking Skills of Students

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Citation: Mananap, M. L. (2025). Teaching Approaches for the Development of Critical Thinking Skills of Students. *Journal of Information Systems Engineering and Management*, *9*(4), 30195. https://doi.org/10.55267/iadt.07.15132

ARTICLE INFO

Received: 15 Dec 2024

Revised: 18 Feb 2025

Accepted: 26 Feb 2025

ABSTRACT

This study aimed to assess the level of critical thinking skills among students at Central Philippines State University (CPSU), as evaluated by both teachers and students, in relation to various teaching approaches. Employed a descriptive-correlational research design, data were carefully collected from 298 students and 105 teachers through a modified standardized questionnaire and Key Informant Interview (KII) Guide Questions. The results indicated a notable finding, while students rated the application of teaching approaches as very high, teachers perceived them in the same manner. Students showed good level of critical thinking skills, particularly in conceptualization and analysis. However, competencies in synthesis and evaluation emerged as areas in need of further enhancement. Significant differences were identified between the assessments of the teaching approaches by teachers and students, especially concerning direct, discovery, metacognitive, and constructivist methods. Furthermore, the study uncovered a relationship between teaching approaches—particularly constructivist and metacognitive methods—and critical thinking skills, including analysis and synthesis. In addition, the teachers' answers to the interview suggested a link to the critical thinking abilities of learners. In the end, the conclusion showed that different teaching strategies favorably influenced students' critical thinking development. Recommendations arising from this study include improving the clarity and applicability of teaching techniques, placing greater emphasis on synthesis and evaluation in student assessments, and fostering self-directed learning through inquiry-based approaches to enrich the educational experience and outcomes for students.

Keywords: Teaching Approaches, Critical thinking Skills, Teachers, Students.

Journal of Information Systems Engineering and Management
2025, 10(35s)

e-ISSN: 2468-4376

https://www.jisem-journal.com/

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INTRODUCTION

Teachers were essential in molding the learners' potential and relish their innate ability to improve. They play a very significant role in the development of students' critical thinking. One of the 21st century skills that the current generation required was the ability to do this. One of the most crucial abilities that so many people lack was the skill towards intelligent analysis. Graduates from colleges, universities, and other for-profit schools must be able to make informed decisions that have purpose and integrate their classroom and practical experience for the development of learners' critical thinking skills.

Critical thinking is essential in achieving outcome and is visible by some as the mark of a well-educated individual and is important in creating an active, engaged employee and global citizen. The researchers analyzed many studies and found that certain instructional approaches were more effective than others. The findings suggested that explicit instruction in critical thinking, along with opportunities for practice and feedback, significantly improved students' critical thinking abilities. The study supports the idea of teaching critical thinking directly, which can be considered as an embedded approach as the study reviews how it is incorporated into different learning environments (Kuhn et al., 2013). Developing critical thinking skills and critical thinking disposition in college students has been set as a primary goal in higher education for decades. Recently it became more urgent in implementing this goal to enhance students' employability in the fast-changing workplace (Tung & Chang, 2009).

Making students learn how to think critically is a very challenging task to teachers because to help students become productive, independent and globally competitive individual teachers' needs to equip and train themselves well to be an effective and efficient mentor.

The purpose of the study is to determine the Level of Critical Thinking Skills as assessed by Teachers and Students using the various Teaching Approaches used during instruction. Hence, this study is undertaken to determine the teaching approaches towards the development of critical thinking skills of students in Central Philippines State University (CPSU) as basis for enhancement.

LITERATUREREVIEW

This chapter presented the key literature and studies about the teaching approaches on the development of critical thinking skills of students at Central Philippines State University and its extension campuses. An effective teaching approach, as outlined by Richards & Rogers (2001) and Stern (2003), serves as the theoretical basis for instructional design, bridging theory and practice to inform pedagogical strategies.

Bobes et al. (2015) identified six prominent teaching approaches in her study on the prevalent teaching approaches utilized by Central Philippines State University educators to foster critical thinking: Direct/Expository Instruction Approach, Discovery/Exploratory Approach, Metacognitive, Cooperative Learning, Computer-Assisted Learning, and Constructivist approaches. Each method plays a crucial role in equipping students with essential skills needed in the fast-evolving job market while aligning with Halpern's (2004) goal of preparing students to assess information critically, make informed decisions, and participate meaningfully in society (Facione, Sanchez & Gainen, 2005).

The Direct Instruction Approach emphasizes a structured, teacher-led lessons and objectives that presented and clarified material through organized methodologies. Engelmann (2007) and other research highlight the importance of clear expectations, immediate feedback, and active student engagement, indicating that teacher-centered instruction can be effective, especially for complex content (Ryder et al., 2006; Cuban, 2001). Alternatively, the Discovery Approach promoted inductive reasoning, encouraging students to generate knowledge through exploration and problem-solving, fostering deeper understanding and the ability to transfer information to new contexts (Kirschner et al., 2006).

The Metacognitive Approach recognized the importance of self-awareness in learners' cognitive processes. Research indicated that implementing metacognitive strategies improved academic achievement, urging a need for teachers to guide learners toward developing their own cognitive capabilities (Ellis et al., 2012; Stewart et al., 2012). In tandem, Cooperative Learning fosters interdependence among students, promoting collaborative problem-solving and deep engagement in learning, ultimately leading to improved cognitive outcomes as students learn from one another (Johnson et al., 2007; Tinto, 2003).

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2025, 10(35s)

e-ISSN: 2468-4376

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Computer-Assisted Learning (CAL) incorporates technology to facilitate personalized learning experiences, although critics stressed that the need for more fixed and standard evaluation of its effectiveness (Levy, 2007; Kamil & Intrator, 2008). Finally, the Constructivist Approach emphasized the important role of learners in knowledge construction, advocating for a shift away from traditional assessments towards collaborative and real-world problem-solving experiences (Haney & McArthur, 2002; Brooks, 2003). This method aligns with the need for educational practices that promotes creative and critical thinking skills in students amidst cultural practices (Vandermensbrugghe, 2004).

The connection of these approaches lies on their collective impact on critical thinking skill development. By integrating diverse methodologies, educators could make multifaceted learning environments that cater to various student needs and learning styles, thus enhancing students' cognitive abilities. In recognizing the importance of fostering a shift in responsibility from teachers to learners, teaching practices can support broader learning and greater academic success, aligning students for future challenges in a complex world (Meyer, 2010).

Critical thinking skills were essential for learners' success in a democratic community as they enable individuals to participate in informed decision-making and contribute to public discourse (Facione, 2010). The development of these skills has been a long-term goal in higher education institutions, as evidenced by various scholars advocating for educational approaches that promote critical thinking among students (Halpern, 2004; Tung & Chang, 2009). Instructional methodologies such as metacognitive strategies, cooperative learning, and constructivist approaches have been proven to enhance critical thinking capacities by encouraging learners to reflect on their cognitive processes, collaborate with peers, and construct knowledge actively (Ellis et al., 2012; Johnson et al., 2007; Brooks, 2003). Furthermore, the integration of technology through Computer-Assisted Learning (CAL) has the potential impact to facilitate critical thinking by providing interactive and individualized learning experiences, though its effectiveness requires careful assessment in the educational setting (Levy, 2007; Kamil & Intrator, 2008).

Despite the recognized importance of critical thinking skills, challenges exist in specifically implementing these pedagogical approaches within traditional educational frameworks, particularly in examination-driven cultures (Vandermensbrugghe, 2004). Studies show that learners often resort to surface-level learning strategies that limit deeper understanding and critical engagement with the material (Gordon et al., 2002; Kyndt, 2011). Research showed that students who adopt deeper and strategic learning approaches tend to achieve better academic outcomes (Cano, 2007; Ballantine et al., 2008). However, the current evaluation systems in education frequently fail to reward metacognitive and deeper approaches to learning, further hindering the development of critical thinking skills among students (Dochy, 2005; Schovller, 1998). For critical thinking competencies to flourish, educational reforms must prioritize pedagogical practices that emphasize student autonomy and interaction while cultivating an environment conducive to meaningful learning experiences (Meyer, 2010).

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design. The design was deemed appropriate because it would attempt to establish relationships that existed between two or more variables as identified by Padua (2000). Likewise, Shields, Patricia and Rangarjan (2013) stated that descriptive research design was used to describe the characteristics of a population or phenomenon being studied.

In the case of this study, the significant relationship of Teaching Approaches and Critical Thinking Skills used a descriptive type of research design. In order to gather qualitative data as support and to strengthen the assessed level of critical thinking skills, as the researcher made use of Key Informant Interview (KII) guide questions in gathering of data from selected participants of the study.

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Respondents of the Study

The respondents of the study were the 105 out of 145 faculty members and 298 out of 1,171 randomly selected first and second year students in Central Philippines State University Main and its Extension Campuses using the Slovin's Formula. A stratified random sampling was used by the researcher to identify the sample per strata as basis for administering the test.

After identifying the samples per strata, Simple Random Sampling was used in identifying the individual samples which would provide the information to the questionnaires.

Data Gathering Instrument

In this study, a modified questionnaire was utilized as a survey for quantitative probing, complemented by Key Informant Interviews (KII) for qualitative support. The student questionnaire consisted of two parts: the first part assessed the level of application of various teaching approaches—namely, Direct Instruction, Discovery, Metacognitive, Cooperative Learning, Computer-Assisted Learning, and Constructivist approaches through a 4-point Likert Scale that ranged from strongly agree to strongly disagree. The second part assessed the levels of critical thinking skills among students based on categories such as Conceptualization, Analysis, Synthesis, and Evaluation, employing a grading scale that classified performance from excellent to poor based on the Institutions' Standard Scaling. Similarly, the faculty questionnaire was divided into two parts, starting from a checklist of the same teaching approaches and their application levels, rated on a 4-point Likert Scale. The second part, conducted through Key Informant Interviews, explored the emotional responses and reactions of faculty regarding the different teaching approaches they employed, asking them how they felt about the use of each approach, including Direct Instruction, Discovery, Metacognition, Cooperative Learning, Computer-Assisted Learning, and Constructivist methods, in the context of developing students' critical thinking skills.

Validity and Reliability of the Instrument

According to Maricon (1975), an instrument is considered valid if it measures what it intends to measure and has the ability to gather data suited to the specific purpose of the study. The modified standardized instrument was validated by three competent jurors from Central Philippines State University-Main Campus who are experts in their respective fields. A rating of 3.71 was given, which was considered as acceptable.

Additionally, the rating scale used for the validity of the instrument was based on the criteria established by Carter V. Good and Douglas F. Scates. According to Ardales (2008), an instrument is considered reliable if it demonstrates consistency, stability, or dependability of the data from the participants.

After incorporating all the recommendations and suggestions made by the jurors, thereby establishing the validity of the instrument, the researcher proceeded to establish its reliability using a test of internal consistency through Cronbach's alpha (α). This tool measures the internal consistency or average correlations of items in the survey instrument to gauge its reliability, particularly when the researcher has items that are not scored simply as right or wrong. The test was administered to five faculty members and twenty-five selected first year and second-year students from one of the extension campuses in the Municipality of Cauayan, Negros Occidental.

The obtained (r) value from the test was 0.83, which indicates a high correlation relationship. Therefore, the instrument was considered reliable. The internal consistency and average correlations of items in the survey instrument, assessed using Cronbach's alpha, were determined using the Statistical Package for the Social Sciences (SPSS).

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Data Gathering Procedure

Upon the completion of the study, the researcher followed series of steps and procedure and included the obtaining communication letters asking permission from the President and Dean of the Graduate School, as well as securing approval from the OIC-University President to access lists of faculty and first-year and second-year students from the Registrar's Office. Additional permission was sought from the OIC-University President to administer the questionnaire to the faculty and students at CPSU-Main Campus and its four extension campuses. The researcher personally distributed the questionnaires to gather firsthand responses, explaining the study's purpose to participants and assuring them of a 100% retrieval rate. The completed survey instruments were then processed for data analysis and using the Statistical Package for Social Sciences (SPSS) software and Microsoft Excel, and statistical tables were constructed based on the statement of the problem.

Data Analysis

After the gathering of data from the respondents, the following were the statistical tools used by the researcher in analyzing the data to answer the specific statement of the problems.

To address the first two statements of the problem, regarding the level of application of teaching approaches and the level of critical thinking skills of students, the mean was utilized. For the assessment of teaching approaches among faculty and students which was categorized into various approaches, including Direct Instruction, Discovery, Metacognitive, Cooperative Learning, Computer Assisted Learning, and Constructivist approaches. The interpretation of the mean scores was based on a four-point Likert scale that determined the level of application ranging from Very High to Very Low. Similarly, the critical thinking skills of students were evaluated based on categories such as Conceptualization, Analysis, Synthesis, and Evaluation, and mean scores were classified as Excellent, Good, Competent, Marginal, or Poor. For the third and fourth problem statements, which focused on the potential significant differences in teaching approaches and levels of critical thinking skills, a t-test was employed. This statistical test compares the means of two different sets of data to ascertain whether any significant differences exist between the assessments of faculty and students regarding teaching approaches, as well as the levels of critical thinking skills among students. To analyze the fifth and sixth statements, which explore the relationship between teaching approaches as assessed by students and faculty and students' levels of critical thinking skills, Pearson's r was utilized. This statistical correlation measure evaluates the strength and direction of a linear association between the two variables, thereby providing insights into how teaching approaches relate to students' critical thinking abilities as perceived by both the students and the faculty.

RESULTS AND DISCUSSION

The following were the study's results and findings based on the results gathered, tabulated, and analyzed.

Level of Application of Teaching Approaches as Assessed by Faculty and Students

The table below shows the level of application of teaching approaches as assessed by faculty and students at Central Philippines State University Main Campus and its extension campuses.

Table 1. Level of Application of Teaching Approaches as Assessed by Faculty and Students

Teaching Approaches	Faculty		Students	
	Mean	***Interpretation***	***Mean***	***Interpretation***
Direct	3.50	Very High	3.18	High
Discovery	3.54	Very High	3.28	Very High
Metacognitive	3.41	Very High	3.23	High
Cooperative Learning	3.39	Very High	3.29	Very High
Computer Assisted Learning	3.41	Very High	3.27	Very High

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e-ISSN: 2468-4376

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Constructivist	3.47	Very High	3.30	Very High
As a whole	3.45	Very High	3.26	Very High

The table above showed that all approaches were assessed as very high by faculty. The direct approach to instruction received a high level of assessment, while all other approaches were rated as very high.

It implies that almost all students preferred these approaches as high. Also, it implied that students agreed that these approaches help develop and maximize their skills and potential as lifelong learners. The strategies employed by their instructors include active engagement, participation, and cooperation, which students considered effective in enhancing their knowledge, skills, and logical reasoning.

Research supported the notion that student-centered approaches, like metacognitive and constructivist strategies, fostered active engagement and promote lifelong learning by improving critical thinking skills (Hattie & Donoghue, 2016). These approaches encourage participation and collaboration, which are vital for effective knowledge acquisition and skill development (Baker, 2017).

On the other hand, the of identified participants to provide qualitative response as support to the teaching approaches applied by teachers. Teacher Bilo stated, "*Using a Direct Approach in Teaching helps students to appreciate the instructor's effort in making them learn and develop their critical thinking skills and that they play a very important role in the teaching and learning process*". Teacher Kim stated, "*Discovery Approach in Teaching was of great help and beneficial to students for it increases their ability to create, discover new knowledge and explore broader issues*." Teacher Etet stated, "*Metacognitive Approach in teaching helps students to develop self-trust, self-esteem and dependent on their knowledge, common sense and understanding*." Teacher Aris stated, "*Cooperative Learning Approach helps students to be socially engaged, which enables them to become effective communicators in order to build or establish unity*." Teacher Cyril stated, "*A teacher is confident that skills of students in using the internet for research would allow them to think critically and be mindful of the different sources and content they found online*." Lastly, Teacher Chim stated, "*Constructivist teachers appreciate approach if students actively respond in class*."

Level of Critical Thinking Skills of Students

The table below shows the level of critical thinking skills of 1st and 2nd year education students of CPSU-Main Campus and other extension campuses.

Table 2. Level of Critical Thinking Skills of Students

Level of Critical Thinking Skills	***Mean***	***Interpretation***
Conceptualization	83.22	Good
Analysis	80.07	Good
Synthesis	79.36	Competent
Evaluation	76.74	Competent
As a whole	79.85	Good

The results indicated that the students' mean scores in conceptualization and analysis were both interpreted as good. Meanwhile, students' mean scores in synthesis and evaluation were both interpreted as competent.

The results imply that most students could define, recall, describe, and understand concepts, as well as explain, elaborate and solve basic to complex problems. They were able to break down information into smaller parts, examine content, and analyze issues. Although they were not experts, students demonstrated competence in identifying and outlining key ideas, drew general conclusions, connecting concepts, remembering transitions between topics, and accurately judging the author's perspective or purpose.

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e-ISSN: 2468-4376

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Research supported the idea that students who engaged in metacognitive and analytical thinking approaches can effectively break down complex information and enhance their understanding of concepts. According to Zhang et al. (2016), students who practiced metacognition were good at problem-solving and analyzing content, leading to improved and increased academic performance and critical thinking skills.

Difference between Teaching Approaches as assessed by Faculty and Students

In the analysis of teaching approaches, significant differences were identified between faculty and student assessments across several methods, as determined by t-tests.

Table 3. Difference between Teaching Approaches as assessed by Faculty and Students

Level of Teaching Approaches (Assessed by Faculty & Students)	***t-test value***	***p-value***	***Interpretation***
Direct	6.113	.000	Significant
Discovery	5.433	.000	Significant
Metacognitive	2.882	.005	Significant
Cooperative Learning	0.305	.761	Not Significant
Computer Assisted Learning	1.462	.147	Not Significant
Constructivist	3.369	.001	Significant

The data showed that faculty students assessment differs in direct, discovery, metacognitive and constructivist approaches while their assessment in cooperative and computer-assisted learning approaches showed no significant difference. The null hypothesis was rejected for the direct, discovery, metacognitive, and constructivist approaches, indicating that faculty had higher mean assessments compared to students. However, the null hypothesis was accepted for the cooperative learning and computer-assisted learning approaches, suggesting no differences in the assessments of faculty and students for these approaches.

The findings imply that faculty and students perceive certain teaching approaches—specifically direct, discovery, metacognitive, and constructivist - differently, with faculty generally rating these methods more favorably. This discrepancy highlights the importance of aligning teaching strategies with student perspectives to enhance educational effectiveness. Conversely, the. Ther lack of significant differences between Cooperative and Computer-Assisted Learning approaches indicated a potential consensus in assessment, indicating these methods were universally accepted.

In one study, it highlighted those inconsistencies between faculty and student perceptions of teaching strategies can influence student engagement and learning outcomes. It emphasized the need for alignment between instructors' teaching methods and students' learning preferences to enhance educational effectiveness (Hattie, 2015).

Relationship between Teaching Approaches as Assessed by Faculty and the Level of Critical Thinking Skills of Students

The table below showed the relationship between teaching approaches as assessed by faculty and the level of critical thinking skills of students.

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e-ISSN: 2468-4376

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Table 4. Relationship between Teaching Approaches as assessed by faculty and the level of *Critical Thinking Skills of students*

Leve of Critical Thinking Skills	Correlation Coefficient Value	Level of Teaching Approaches					
		Direct	Discovery	Metacognitive	Cooperative Learning	Computer-Assisted Learning	Constructivist
Conceptualization	Pearson Value	.056	.066	.004	.078	.003	.066
	p-value	.357	.257	.938	.180	.954	.257
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*
Analysis	Pearson Value	.900	.030	.005	.078	.149	.060
	p-value	.121	.605	.928	.180	.050	.031
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Significant*	*Significant*
Synthesis	Pearson Value	.027	.109	.109	.054	.027	.054
	p-value	.640	.060	.060	.349	.640	.349
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*
Evaluation	Pearson Value	.005	.071	.109	.029	.066	.030
	p-value	.928	.223	.061	.618	.257	.605
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*

The table indicated that, as assessed by faculty, computer-assisted learning and constructivist approaches were both found related to analysis, while all other approaches were not found related to conceptualization, synthesis, and evaluation.

These methods could effectively enhance students' analytical skills. However, since other approaches did not show a relationship with conceptualization, synthesis, and evaluation, they may not be as effective for fostering higher-order thinking skills in those areas. Therefore, emphasis on integrating computer-assisted and constructivist strategies in the curriculum was warranted to promote comprehensive cognitive development.

In recent years, research has highlighted the effectiveness of computer-assisted and constructivist strategies in enhancing higher-order thinking skills among students. In a research conducted by Wang (2015), it was found that integrating technology in learning environments supports the development of critical thinking and analytical skills, fostering better conceptualization and evaluation abilities. Additionally, Harlow et al. (2016) emphasized that constructivist approaches significantly contribute to the cognitive development of learners by promoting active engagement and a deeper understanding of complex concepts.

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e-ISSN: 2468-4376

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Relationship between Teaching Approaches as Assessed by Students and their Level of Critical Thinking Skills

The table below showed the relationship between teaching approaches as assessed by faculty and the level of critical thinking skills of students.

Table 5. Relationship between Teaching Approaches as assessed by students and their level of Critical Thinking Skills

Leve of Critical Thinking Skills	Correlation Coefficient Value	Level of Teaching Approaches					
		Direct	Discovery	Metacognitive	Cooperative Learning	Computer-Assisted Learning	Constructivist
Conceptualization	Pearson Value	.780	.003	.005	.066	.005	.027
	p-value	.180	.954	.928	.257	.932	.640
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*
Analysis	Pearson Value	.060	.070	.029	.030	.003	.149
	p-value	.240	.189	.618	.605	.954	.050
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Significant*
Synthesis	Pearson Value	.027	.054	.163	.109	.000	.027
	p-value	.640	.349	.050	.060	.995	.640
	Interpretation	*Not Significant*	*Not Significant*	*Significant*	*Not Significant*	*Not Significant*	*Not Significant*
Evaluation	Pearson Value	.029	.029	.029	.054	.210	.058
	p-value	.618	.618	.618	.349	.714	.319
	Interpretation	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*

The table indicated that students assessed the metacognitive approach as related to synthesis, while the constructivist approach was related to analysis. Meanwhile, other approaches, such as direct instruction, discovery learning, cooperative learning, and computer-assisted learning, were not found to be related to students' critical thinking skills in conceptualization and evaluation.

The findings implied that focusing on metacognitive and constructivist approaches could enhance students' abilities in synthesis and analysis, respectively. However, the insignificant relationship found for direct instruction, discovery learning, cooperative learning, and computer-assisted learning suggests that these methods may need to be reevaluated or adapted to better support the development of critical thinking skills in conceptualization and evaluation.

Research indicates that metacognitive strategies, which aimed to enhance students' self-awareness and regulation of their thinking processes, significantly improve critical thinking abilities, especially in synthesis (Elder & Paul, 2014). Similarly, constructivist approaches, which encourage active learning through exploration and collaboration, have been linked to improved analytical skills (Johnson et al., 2015). However, other traditional instructional strategies, such as direct instruction and cooperative learning, have shown inconsistent results

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regarding their effectiveness in fostering deeper critical thinking, suggesting a need for adaptation to align with contemporary educational demands (Tsai, 2016).

CONCLUSION

The assessment of teaching approaches presented a high level of application as assessed by teachers, indicating a strong emphasis on pedagogical strategies that likely foster effective learning environments. In contrast, it showed that students have high to very high application of specific approaches, particularly direct and metacognitive methods, suggesting that these strategies resonate well with learners and may enhance their educational experience.

Additionally, regarding critical thinking skills, students demonstrated a good level of proficiency in conceptualization and analysis, indicating solid skills foundational in these areas. However, they were only competent in synthesis and evaluation, pointing to areas that may require further development to enhance overall critical thinking skills competency.

Moreover, the significant differences observed between the various teaching approaches, particularly direct, discovery, metacognitive, and constructivist approaches, presented contrasting perception of their effectiveness in teaching as assessed by faculty and students. Interestingly, the lack of significant difference in computer-assisted and cooperative learning approaches suggested a strong consensus on their effectiveness or a need for greater exploration of these methods in practice.

In terms of critical thinking skills, the significant differences identified among conceptualization, analysis, synthesis, and evaluation further reinforce the need for targeted instructional strategies to bridge gaps in students' learning competencies. The notable findings that analysis and evaluation, as well as synthesis and evaluation, show significant differences underscored the varied and interrelated nature of these critical thinking components. Conversely, the absence of significant difference between analysis and synthesis highlights a potential area for instructional improvement and continuous development.

Furthermore, the significant relationships found between constructivist and analysis, as well as between metacognitive strategies and synthesis as assessed by students, suggested that these teaching approaches effectively improved specific critical thinking skills. Additionally, the significant relationship between computer-assisted learning and constructivist approaches with analysis, as evaluated by faculty, emphasizes the importance of integrating technology with pedagogical strategies to foster deeper analytical skills in students. These findings collectively highlight the need for continuous evaluation and enhancement of teaching approaches to better align with both student learning outcomes and critical thinking development.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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