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CURRENT STATUS OF USING ARTIFICIAL INTELLIGENCE IN DESIGNING MATHEMATICS TEACHING ACTIVITIES FOR GRADE 3 STUDENTS AT TAN TIEN PRIMARY SCHOOL, PHU THO PROVINCE

Nguyen Huy Vinh¹, Vu Thi Minh Hang², Tran Thi Diem Quynh³, Bui Thi Kim Oanh⁴ and Hoàng Huyền Trang⁵

Thai Nguyen University of Education, Vietnam

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ABSTRACT

In the context of educational digital transformation, Artificial Intelligence (AI) has increasingly been considered an effective tool to support teachers in designing and organizing teaching activities. This study investigates the current status of using AI in designing Mathematics teaching activities for Grade 3 students, particularly in the topic of Numbers and Operations, at Tan Tien Primary School, Phu Tho Province. The study was conducted through a survey of 10 teachers and 68 students, combined with classroom observation and descriptive statistical analysis. The findings show that teachers have initially approached and used several AI tools such as ChatGPT, Canva, Quizizz, and Gemini in lesson planning, designing visual learning materials, organizing learning games, and supporting assessment. However, the use of AI remains uneven and is mainly concentrated in warm-up and exploration activities, while practice, application, and assessment activities have not yet been fully exploited. Based on these findings, the article proposes several recommendations to improve the effectiveness of AI application in Mathematics teaching at the primary level.

KEYWORDS: Artificial Intelligence; Mathematics Teaching; Teaching Activities; Numbers and Operations; Primary Education.

1. INTRODUCTION

In recent years, Artificial Intelligence has become one of the technologies with a strong impact on education. AI not only supports teachers in preparing lessons, designing learning materials, creating questions and exercises, but also contributes to innovating the organization of learning activities in a more visual, interactive, and personalized manner. In Primary Education, especially in Mathematics Teaching, the application of AI is meaningful because students at this age are still strongly influenced by visual thinking and need to learn through images, games, concrete situations, and experiential activities. Grade 3 Mathematics plays an important role in developing students' computational competence, logical thinking, and problem-solving ability. Among its content areas, Numbers and Operations is a foundational topic that helps students practise arithmetic skills, understand the meaning of operations, and apply knowledge to solve word problems. However, in actual teaching practice,

some students still face difficulties in performing calculations with carrying, identifying appropriate operations, or solving problems related to real-life situations. Therefore, using AI to support teachers in designing visual learning materials, generating guiding questions, organizing learning games, and personalizing practice activities is a research direction with practical significance.

Based on this context, this article focuses on investigating the current status of using AI in designing Mathematics teaching activities for Grade 3 students at Tan Tien Primary School, Phu Tho Province. By analyzing the survey results, the study identifies the initial achievements, existing difficulties, and proposes several recommendations to improve the effectiveness of AI application in Primary Mathematics Teaching.

2. RESEARCH METHODS

2.1. Methodological Framework

This study employed a combination of theoretical and practical research methods. Theoretical research methods were used to systematize key issues related to Artificial Intelligence in education, the role of AI in Mathematics Teaching, and the requirements for applying AI in designing teaching activities at the primary level. Regarding practical research, the study used questionnaires for teachers and students. The survey participants included 10 teachers directly teaching Grade 3 Mathematics and 68 Grade 3 students at Tan Tien Primary School, Phu Tho Province. The survey focused on teachers' frequency of AI use, teaching activities involving AI, commonly used AI tools, teachers' awareness of AI, the effectiveness of lessons with and without AI, difficulties in implementation, and teachers' needs for AI-related training.

The collected data were processed using descriptive statistics, including frequency, percentage, mean score, variance, and standard deviation. In addition, classroom observation was used to record actual manifestations of teachers and students in Mathematics lessons involving AI. The combination of these methods helps reflect the current status of using AI in designing Grade 3 Mathematics teaching activities relatively comprehensively.

3. RESEARCH RESULTS AND DISCUSSION

3.1. Current Status of Using AI in Designing Mathematics Teaching Activities for Grade 3 Students

To investigate the current status of using Artificial Intelligence in designing Mathematics teaching activities for Grade 3 students, the research team surveyed 10 teachers directly teaching at Tan Tien Primary School. The survey focused on the frequency of AI use, teaching activities involving AI, commonly used AI tools, and difficulties encountered by teachers during implementation. The results are presented in Table 3.1

Table 3.1 Current status of using AI in designing Mathematics teaching activities for Grade 3 students

No.	Evaluation content	Options	Frequency	Percentage (%)	Rank
1	Frequency of teachers' AI use in designing teaching activities	Very frequently	2	20	3
		Frequently	5	50	1
		Occasionally	3	30	2
		Never	0	0	4
	Total		10	100	
2	Teaching activities involving AI	Warm-up activities	9	90	1
		Exploration activities	8	80	2
		Practice activities	6	60	4
		Application activities	7	70	3
3	Commonly used AI tools	ChatGPT	10	100	1
		Canva Magic Write/Canva AI	9	90	2
		Quizizz AI	7	70	3
		Google Gemini	6	60	4
		MagicSchool AI	1	10	5
4	Difficulties in using AI	Lack of time to learn and apply AI	7	70	1
		Lack of skills in using AI tools	6	60	2
		Lack of instructional materials	5	50	3
		Limited facilities and infrastructure	3	30	4

The results in Table 3.1 show that most teachers have initially used AI in designing Mathematics teaching activities for Grade 3 students. Specifically, 50% of teachers reported using AI frequently, 20% very frequently, and 30% occasionally; none of the teachers selected the “never” option. This indicates that AI has begun to be introduced into lesson design. However, the level of use is not entirely consistent, as 30% of teachers still use AI only occasionally.

In terms of lesson stages, AI is used most frequently in warm-up activities, accounting for 90%, followed by exploration activities at 80%. Meanwhile, practice activities account for only 60%, the lowest among the surveyed teaching activities. This indicates that teachers mainly use AI to create introductory situations, learning games, visual illustrations, or guiding questions to attract students' attention. However, the use of AI in practice activities remains lower than in warm-up and exploration

activities, showing that teachers have not fully exploited AI's role in knowledge consolidation, differentiated exercises, and formative assessment. Regarding AI tools, ChatGPT is the most commonly used tool, selected by 100% of teachers, followed by Canva AI at 90%, Quizizz AI at 70%, and Google Gemini at 60%. This reflects teachers' preference for accessible tools that directly support lesson preparation, visual material design, and interactive learning activities. However, the greatest difficulty is lack of time to learn and apply AI, accounting for 70%, followed by lack of skills in using AI tools at 60%. These are important barriers indicating that AI application in teaching remains largely spontaneous and has not yet been implemented systematically.

3.2. Teachers' Awareness of AI in Teaching

In addition to the frequency and level of AI use, the study also investigated teachers' awareness of the role of AI in Grade 3 Mathematics Teaching. The results are presented in Table 3.2.

Table 3.2 Teachers' awareness of AI in teaching

No.	Evaluation content	Mean	Variance	Standard deviation
1	I clearly understand the concept of AI in education	3.8	1.36	1.17
2	I understand how to apply AI in teaching activities	3.7	1.19	1.09
3	AI can support personalized learning	3.6	1.36	1.17
4	AI contributes to improving lesson effectiveness	3.6	1.36	1.17
5	AI can support teachers in creating questions and exercises appropriate to students' levels	3.7	1.50	1.22

The results in Table 3.2 show that teachers have a relatively positive awareness of the role of AI in teaching. The criterion "I clearly understand the concept of AI in education" achieved the highest mean score, with $M = 3.8$. The criteria "I understand how to apply AI in teaching activities" and "AI can support teachers in creating questions and exercises appropriate to students' levels" both reached $M = 3.7$. This indicates that teachers have an initial understanding of AI and recognize its supporting role in designing teaching activities.

However, the criteria "AI can support personalized learning" and "AI contributes to improving lesson effectiveness" both reached only $M = 3.6$. This shows that although teachers have a positive attitude toward AI, their understanding of deeper functions such as personalized learning, learning progress monitoring, and assessment support is still not very clear. In addition, the standard deviations ranged from 1.09 to 1.22, indicating a certain dispersion in teachers' awareness. This suggests the need to strengthen training and provide teachers with clearer pedagogical guidance on using AI.

3.3. Lesson Effectiveness with and Without AI

To evaluate the initial effectiveness of AI application in Grade 3 Mathematics Teaching, the research team surveyed teachers about several student learning indicators in lessons without AI and lessons with AI. The results are shown in Tables 3.3.1 and 3.3.2.

Table 3.3.1 Teachers' awareness of AI in teaching

No.	Evaluation content	Mean	Variance	Standard deviation
1	Students are interested in learning	3.7	0.75	0.87
2	Students actively participate in learning activities	3.8	0.86	0.93
3	Students understand the lesson quickly	3.7	0.75	0.87
4	Students actively find ways to solve problems	3.6	0.86	0.93
5	Students solve mathematical problems accurately	3.7	0.86	0.93

Table 3.3.2 Teachers' awareness of AI in teaching

No.	Evaluation content	Mean	Variance	Standard deviation
1	Students are interested in learning	3.9	1.69	1.30
2	Students actively participate in learning activities	3.9	1.69	1.30
3	Students understand the lesson quickly	3.8	1.61	1.27
4	Students actively find ways to solve problems	3.8	1.61	1.27
5	Students solve mathematical problems accurately	3.9	1.61	1.27

A comparison of Tables 3.3.1 and 3.3.2 shows that all criteria measuring lesson effectiveness with AI have higher mean scores than those without AI. Specifically, the criterion students are interested in learning increased from 3.7 to 3.9; students actively participate in learning activities increased from 3.8 to 3.9; students understand the lesson quickly increased from 3.7 to 3.8; students actively find ways to solve problems increased from 3.6 to 3.8; and students solve mathematical problems accurately increased from 3.7 to 3.9. These results indicate that AI application has a positive impact on several aspects of students' learning, especially learning interest, participation, and problem-solving accuracy. In Grade 3 Mathematics Teaching, AI tools such as ChatGPT, Canva, and Quizizz can support teachers in designing visual situations, learning games, interactive questions, and practice tasks suited to students' levels. As a result, lessons become more engaging and students have more opportunities to participate in learning activities.

However, the differences between the two groups of results are not very large, mainly ranging from 0.1 to 0.2 points. In addition, the variance and standard deviation in lessons with AI are higher than

those without AI. For example, the standard deviation for students are interested in learning was 0.87 without AI, while it increased to 1.30 with AI. This indicates that the impact of AI on students is not entirely uniform; some students may be highly interested in technology-supported activities, while others still need direct teacher guidance. Therefore, AI should be regarded as a supporting tool rather than a replacement for traditional teaching methods.

3.4. Teachers' Training Needs for Using AI in Designing Teaching Activities

To clarify teachers' support needs in the process of applying AI, the research team investigated teachers' training needs. The results are presented in Table 3.4

Table 3.4. Training needs for using AI in designing teaching activities.

No.	Evaluation content	Options	Frequency	Percentage (%)	Rank
1	Need for training on using AI in designing teaching activities	Yes	10	100	1
		No	0	0	2
	Total		10	100	
2	Desired training content	Applying AI in designing teaching activities	9	90	1
		Applying AI in designing questions and exercises	8	80	2
		Applying AI in student assessment	7	70	3
		Guidance on safe and effective AI use	9	90	1

The results in Table 3.4 show that 100% of the surveyed teachers expressed a need for training on using AI in designing teaching activities. This is a noteworthy finding, reflecting teachers' clear practical needs in a context where AI is receiving increasing attention but has not yet been systematically introduced or guided in teaching practice. Regarding desired training content, 90% of teachers selected applying AI in designing teaching activities, and 90% selected guidance on safe and effective AI use. In addition, 80% of teachers wanted training on designing questions and exercises with AI, while 70% wished to receive support in applying AI to student assessment. These results show that teachers need not only technical instructions on how to use AI tools, but also pedagogical guidance, principles for safe use, methods for checking AI-generated content, and ways to apply AI appropriately to primary school students.

The findings suggest that developing teachers' AI application competence is necessary. Training programs should focus on the process of designing AI-supported teaching activities, writing effective prompts, checking the accuracy of AI-generated content, designing visual learning materials, and using AI in formative assessment. In Grade 3 Mathematics Teaching, teachers especially need guidance on how to use AI to help students understand the nature of operations, analyze word problems, and develop problem-solving competence.

4. RESEARCH RESULTS AND DISCUSSION

The research results show that the use of Artificial Intelligence in designing Mathematics teaching activities for Grade 3 students at Tan Tien Primary School has shown positive initial signs. Teachers have begun to use AI tools such as ChatGPT, Canva, Quizizz, and Gemini to design lessons, create visual learning materials, organize learning games, and support assessment. AI is most frequently used in warm-up and exploration activities, contributing to increasing students' learning interest, enhancing visualization, and encouraging students to participate more actively in lessons.

However, the current status also reveals several limitations. Teachers have not deeply exploited AI in practice, application, and assessment activities; their AI tool-use competence remains uneven; instructional materials are still insufficient; teachers have limited time for self-study; and the facilities in some classrooms do not fully meet the requirements for AI-supported teaching. Therefore, AI currently plays only an initial supporting role and has not yet become a systematically integrated component of Grade 3 Mathematics Teaching. Several recommendations are proposed. First, schools should improve technological facilities, Internet access, and digital learning materials to facilitate AI application in teaching. Second, professional training sessions should be organized to guide teachers in using AI for designing teaching activities, especially in generating questions, creating visual materials, organizing learning games, and conducting assessment. Third, teachers should use AI selectively, always checking and adjusting AI-generated content to ensure accuracy, alignment with lesson objectives, and suitability for Grade 3 students' cognitive characteristics. Fourth, further studies should be conducted in more schools, grade levels, and Mathematics content areas to provide a more comprehensive evaluation of AI effectiveness in Primary Education.

Overall, AI has strong potential to support innovation in Primary Mathematics Teaching. However, its effectiveness depends mainly on teachers' pedagogical competence and technological competence. Therefore, AI should be considered a tool that supports teachers in designing and organizing learning activities, rather than replacing teachers' role in guiding, adjusting, and assessing students' learning processes.

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