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The Effect of Generative Artificial Intelligence Utilization and Self-Efficacy on the Performance of Elementary School Teachers in Subulussalam City

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ABSTRACT

THE EFFECT OF GENERATIVE ARTIFICIAL INTELLIGENCE UTILIZATION AND SELF-EFFICACY ON THE PERFORMANCE OF ELEMENTARY SCHOOL TEACHERS IN SUBULUSSALAM CITY. Generative artificial intelligence (GenAI) is growing quickly, which has opened up new ways for it to help teachers with their professional tasks, such as planning lessons, making educational materials, designing tests, and coming up with new ways to teach. But having and using technology doesn't always make teachers better at their jobs. This is because the success of integrating technology may also depend on psychological factors, especially how confident teachers are in their own abilities. The point of this study was to look into how used generative AI and teachers' confidence in their own abilities affected the work of primary school teachers in Subulussalam City, Aceh, Indonesia. It used a quantitative explanatory research design. Structured questionnaires were used to collect data on GenAI use, teacher self-efficacy, and teacher success. Linear regression was used to look at the data and see how each independent variable affected how well the teachers did their jobs. The results showed that using GenAI improved teacher performance in a way that was both positive and statistically significant ($\beta = 0.286$, $t = 4.028$, and $p < 0.001$). It was also found that teacher self-efficacy improved teacher performance in a way that was statistically significant ($\beta = 0.471$, $t = 6.926$, and $p < 0.001$). It was found that teacher self-efficacy had a larger regression coefficient than GenAI use. This meant that it was a better predictor of teacher success in the model. These results show that GenAI can help teachers with their professional duties. However, the benefits of the technology will depend a lot on how well, confidently, and willingly teachers are able to use it. GenAI use and teacher self-efficacy are two important factors that can help predict how well primary school teachers in Subulussalam City will do their jobs. In this era of GenAI, giving teachers access to AI technologies is not enough to improve their performance. They should also receive ongoing professional development that builds their AI skills, pedagogical skills, and sense of self-efficacy. The results make it clear how important it is to have a method for teacher development that combines new technologies with improving teachers' professional and mental skills.

Keywords: Generative artificial intelligence; GenAI utilization; teacher self-efficacy; teacher performance; educational technology.

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INTRODUCTION

The rapid growth of generative artificial intelligence (GenAI) is changing the way schools function and how teachers plan, create, teach, and evaluate activities. GenAI systems are different from other digital technologies because they can respond to natural language prompts to create text, lesson plans, assessments, feedback, explanations, and other types of educational content. As a result, AI is changing its role in education from a technology that mostly helps people get knowledge to one that could change the way teachers do their jobs. This change is especially important at the elementary school level, where teachers have to deal with a wide range of students' learning needs while also teaching, grading, running the school, and developing professionally.

Recent data from around the world show that teachers' use of AI is growing quickly. The OECD's Teaching and Learning International Survey (TALIS) 2024, which polled about 280,000 teachers in 55 education systems, found that AI was already being used by teachers in their jobs. 68 Of the teachers who said they used AI 68 % did so to learn more about a subject or summarize it, and 64% did so to make lesson plans. AI was also used to analize data on student involvement or performance and to help with assessment tasks. These results show that AI is being used more and more in professional tasks, not just for fun or for personal use (OECD, 2025) even though adoption patterns were different across school systems and levels.

There is also evidence of rapid growth among elementary school teachers . In the UK, the National Literacy Trust's annual poll found that the number of teachers who had used generative AI rose from 31.0% in 2023 to 47.7% in 2024 and 58.0% in 2025. the GenAI change (National Literacy Trust, 2021). In 2025, teachers who used Gen AI at least once a month said they mostly used it to make lesson plans (58.7%), quizzes or comprehension tests (46.4%), sum up papers (31.4%), and show students how to write in different styles (20.7%). Based on these patterns, it appears that GenAI is already being used for more than just finding general information. It is used to prepare teachers and create new lessons.

The fast rise of AI use, on the other hand, does not always mean that it is being used effectively or in a way that is good for teaching. The same survey from the National Literacy Trust found that 66.9% of teachers thought they needed more training, support, and resources to use Gen AI well. Teachers were also worried about how AI would affect students' interest in reading, writing, and critical thinking, as well as the value of self learning on their own. These results show a significant difference between using AI and being good at it: teachers may use AI tools but do not have the knowledge, skills, confidence, or good teaching judgment to use them effectively.

This distinction is particularly relevant to tehe performance of teachers. GenAI may reduce the time required to prepare instructional materials, generate assessment items, summarize information, and draft administrative documents. However, the resulting improvement in productivity does not automatically translate into better teaching. AI-generated outputs may be inaccurate, overly generic, contextually inappropriate, culturally insensitive, or pedagogically misaligned. Therefore, teachers

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must be able to critically evaluate, modify, contextualize, and integrate AI-generated outputs into real world instructional situations. In this sense, the potential contribution of GenAI to teacher performance depends not simply on whether teachers use AI, but on how, why, and for what professional purposes they use it.

Emerging empirical research supports this proposition. A recent study examining the influence of GenAI on teaching performance reported that implementing generative AI has the potential to improve teaching effectiveness and pedagogical practices (Arlinda et al., 2025). Similarly, research involving primary school teachers has shown that AI-supported professional development experiences can facilitate changes in teachers' instructional practices and perceptions. For example, Yang et al. (2024) examined 50 in-service primary school teachers participating in an AI-based professional development program. The study found that teachers developed mastery experiences through lesson planning, instructional enactment, reflection, and community support, which subsequently strengthened their self-efficacy for AI-integrated teaching methods.

Therefore, the social aspect of adopting AI is crucial. Teacher self-efficacy is an important concept. According to social cognitive theory, self-efficacy is the confidence a person has in their ability to plan and carry out the actions needed to achieve certain goals. In educational settings, teacher self-efficacy affects how teachers deal with problems in the classroom, how long they stick with something when things get tough, how they choose teaching methods, how they run their classes, how they keep students interested, and how they change their lessons to fit the needs of each student. Self-efficacy may also affect whether teachers see AI as an empowering teaching tool or as a hard and potentially dangerous technology in a world where AI is increasingly used in schools.

Recent research has made it easier to understand the meaning of teacher AI self-efficacy. Chiu, Ahmad, and Çoban (2025) created and tested the Teacher Artificial Intelligence Competence Self-Efficacy (TAICS) scale with 434 K–12 teachers. Their tested framework comprises six parts: AI knowledge, AI pedagogy, AI assessment, AI ethics, human-centered education, and professional engagement. The results show that a teacher's AI skill is more than just being able to use an AI tool. The framework stresses that teachers need to understand AI, use it in the classroom, evaluate assessments that use AI, deal with ethical problems, maintain human-centered education, and keep learning as professionals.

Evidence has also shown that professional development and teacher self-efficacy are linked. Yang et al. (2024) discovered that teachers' self-efficacy in AI-integrated teaching was raised through mastery experiences that included lesson planning, classroom practice, reflection, and community support as part of professional development activities. Their findings are particularly relevant to primary education because the study specifically involved in-service primary school teachers. The results suggest that teachers' confidence in using AI is not merely an individual psychological characteristic but can be developed through structured professional experiences and supportive learning environments.

There is a theory and an empirical link between teacher self-efficacy and how well teachers do their jobs. If teachers believe they can do their job well, they are more likely to put in the effort, keep going when things get tough, try out new ways of

teaching, and deal with problems in the classroom constructivel. New evidence from the real world supports this relationship between BMI and mortality. Li et al. (2025), in a study involving 581 university teachers, found that self-efficacy was part of the psychological mechanism linking organizational support and teacher job performance. Their structural model demonstrated that organizational and psychological factors jointly contribute to differences in teacher performance. Although the study was conducted in higher education, it provides contemporary evidence that self-efficacy is relevant for explaining variations in teachers' professional performance.

Therefore, the combination of Gen AI utilization and teacher self-efficacy provides a theoretically meaningful framework for examining teacher performance. GenAI can be conceptualized as a technological resource that potentially improves efficiency and expands teachers' capacity to perform professional tasks, whereas self-efficacy represents an individual motivational resource that influences whether teachers can effectively mobilize technological resources. A teacher may have access to sophisticated AI tools but may use them minimally or uncritically because of low confidence or inadequate competence. Conversely, a teacher with strong self-efficacy may be more willing to experiment with AI, evaluate its outputs, adapt them to classroom needs, and integrate them into instructional decision-making.

This interaction is especially important in Indonesia, where educational transformation is occurring across diverse geographical, institutional, and socioeconomic contexts. Recent Indonesian research has begun documenting the opportunities and challenges associated with GenAI in schools. A study focusing on Indonesian primary teachers identified the potential of generative text AI to reduce teachers' administrative workload through activities such as report writing, lesson-outline preparation, and other routine documentation. Simultaneously, the study highlighted concerns related to trust in AI-generated content, cultural relevance, privacy and data security, unequal digital competencies, infrastructure limitations, and the potential overdependence of teachers on AI systems (Ginola & Amarulloh, 2025).

Recent Indonesian research has also indicated that teacher readiness remains an important issue. A quantitative study involving 384 teachers from different educational institutions in Indonesia examined the implementation of Gen AI in relation to teachers' pedagogical readiness and student learning autonomy. The study emphasizes that the integration of GenAI requires not only technological access but also pedagogical readiness and teacher capacity to use AI appropriately in instructional processes. Furthermore, a recent study involving 189 elementary school teachers in Indonesia examined teachers' understanding of AI and the factors influencing their readiness to implement AI in learning. The study identified teacher capacity, infrastructure, and professional support as important considerations for AI implementation at the primary school level.

The Indonesian context is particularly important because the rapid availability of generative AI may create a discrepancy between access to AI tools and capacity to use them effectively. ChatGPT and similar applications are increasingly accessible to teachers however, accessibility alone does not guarantee pedagogical effectiveness. Teachers require sufficient AI literacy, pedagogical knowledge, critical evaluation skills, ethical awareness, and confidence. Therefore, studying AI utilization and

teacher self-efficacy provides a more comprehensive explanation of how emerging technologies may contribute to teacher performance.

The situation in Aceh provides an important and relatively underexplored context for this study. Evidence from the province demonstrates that AI-related teacher development activities have begun to emerge. In February 2025, a collaborative workshop involving education authorities and technology stakeholders provided AI training to 55 teachers from 28 madrasahs across Banda Aceh and Aceh Besar. The training introduced teachers to the use of AI technologies, including ChatGPT for educational purposes. This initiative illustrates the increasing institutional recognition of the need to prepare teachers for AI-supported education in Aceh.

Similar initiatives have been implemented at the school level in the past. In Banda Aceh, a 2025 training program introduced teachers to AI-based tools for developing interactive learning media and The reported outcomes included improvements in teachers' understanding, creativity, and confidence in integrating AI into learning activities. In 2026, the Banda Aceh municipal government launched a dedicated AI digital class for primary school teachers, involving 65 elementary school principals who were expected to facilitate the use of AI in teaching and learning within their schools. This indicates that AI integration is increasingly entering primary education policy and professional development agendas in Aceh.

Empirical evidence from Aceh is beginning to appear in peer-reviewed educational research. Sahputra et al. (2025), examining AI-supported learning in several elementary schools in Banda Aceh, found that AI offered potential benefits for personalized learning, automated assessment, feedback, and inclusive learning environments. However, the study also identified significant barriers, including limited Internet access, insufficient technological devices, low digital literacy among teachers and students, and uneven policy support. These findings are important because they demonstrate that the success of AI integration depends on more than the availability of AI applications; it also requires appropriate infrastructure, teacher competence, professional development, and institutional support.

Further evidence from Lhokseumawe demonstrates the potential of structured AI interventions to improve teachers competence. Istiarsyah et al. (2025) conducted a quasi-experimental study involving 25 junior high school teachers in Lhokseumawe who used ChatGPT for lesson planning, assessment, and content development. Although the study involved junior high school rather than primary school teachers, it provides relevant local evidence that AI-supported professional learning is already feasible within the Aceh educational context.

Despite these developments, there remains an important research gap. Existing studies have predominantly examined teachers' perceptions, readiness, competence, professional development, and intention to use AI. Fewe studies have directly examined whether actual GenAI utilization is associated with teacher performance, particularly among primary school teachers. Moreover, existing studies often examine technological and psychological factors separately. Therefore, the relationship between Gen AI utilization, teacher self-efficacy, and teacher performance has not been sufficiently investigated in a single empirical model.

This gap is particularly evident in Subulussalam City, Aceh Indonesia. Although AI-related educational initiatives are increasingly visible in other parts of Aceh, there

is currently insufficient empirical evidence regarding the extent to which elementary school teachers in Subulussalam use GenAI for lesson planning, instructionalmaterial development, assessment, administrative work, and professional development. More importantly, it remains unclear whether the utilization of GenAI contributes to teacher performance and whether teacher self-efficacy strengthens the capacity of teachers to translate AI access into effective professional practice.

The absence of such local evidence represents both an empirical and contextual gap. The empirical gap concerns the limited evidence regarding the relationship between Gen AI utilization and teacher performance. The contextual gap concerns the lack of evidence from elementary school teachers in a relatively under-researched region in Indonesia. Addressing these gaps is important because educational technology policies developed at the national or international level cannot automatically be assumed to produce equivalent outcomes across different local contexts.

Therefore, this study aims to examine the influence of generative artificial intelligence utilization and teacher self-efficacy on the performance of elementary school teachers in Subulussalam City, Aceh, Indonesia. Specifically, thise study investigates whether (1) GenAI utilization significantly influences teacher performance, (2) teacher self-efficacy significantly influences teacher performance, and (3) GenAI utilization and teacher self-efficacy jointly explain variations in teacher performance.

Thise study contributes to the emerging literature on AI in education in three ways. First, it shifts the focus from students and higher education to primary school teachers, a group that has received comparatively less empirical attention in GenAI research. Second, it integrates a technological construct Gen AI utilization with a psychological construct teacher self-efficacy to explain teacher performance. Third, it provides empirical evidence from Subulussalam City, thereby extending the geographical scope of research on AI-supported teacher development beyond major Indonesian educational centers.

Conceptually, thise study proposes that GenAI utilization may function as a technological resource that supports teachers in performing professional tasks, while self-efficacy may represent an important motivational condition that determines how effectively teachers adopt and integrate that resource.

METODE

This research used a quantitative, cross-sectional methodology to look at how using Generative Artificial Intelligence (GenAI) and teachers' confidence in their own abilities affected their work as elementary school teachers in Subulussalam City, Aceh, Indonesia. A quantitative approach was chosen because the study's goal was to use numerical data and statistical analysis to look at the relationships between the variables in the real world.

The study population consisted of teachers working in public elementary schools in Subulussalam City Indonesia. A total of 82 public elementary schools were selected

as study samples. Two teachers from each selected school participated in the study, resulting in a total sample of 164 elementary school teachers.

The inclusion of two teachers from each school was intended to obtain teacher-level information while maintaining the representation across the selected schools. Respondents were eligible to participate if they were actively teaching in the selected public elementary schools and willing to complete the research questionnaire.

A structured questionnaire with questions measuring the three constructs was used to collect data. A five-point Likert scale was used in the survey, with 1 meaning "strongly disagree" and 5 meaning "strongly agree."

Six items comprised the GenAI utilization construct, eight items comprised the teacher self-efficacy construct, and ten items comprised the teacher performance construct. The questionnaire was given to the 164 teachers who were chosen after obtaining permission from both the school and the participants.

Tes were perpormed on the measurement model to determine its reliability and how well it fit together. Cronbach's alpha and Composite Reliability (CR) were used to check internal consistency. Values above 0.70 were considered to indicate good reliability.

The Average Variance Extracted (AVE) test was used to check for convergent validity. If the AVE number was above 0.50, it meants that the construct explained a good amount of the variation in its indicators.

The Fornell–Larcker criterion was used to check for discriminant validity. This indicates that the square root of the AVE for each construct should be higher than its relationship with the other constructs.

Descriptive and inferential statistical methods were used to analyze the collected data. Descriptive statistics, such as the mean, standard deviation, minimum, and maximum numbers, were used to summarize the characteristics of the respondents and the way the study variables were spread out.

We used inferential analysis to examine how using GenAI and teachers' confidence in their abilities affected their work. Multiple linear regression analysis was used, with teacher performance as the outcome variable and GenAI use and teacher confidence as the predictor variables.

The regression model is described as follows:

Teacher Performance = $\beta_0 + \beta_1$(Gen AI Utilization) + β_2(Self-Efficacy) + ε

where β_0 represents the constant, β_1 and β_2 represent the regression coefficients of Gen AI utilization and self-efficacy, respectively, and ε represents the error term.

The level of statistical significance was set at $P < 0.05$. We examined the size and direction of the regression coefficients to determine the extent towhi ch each predictor affected teacher success.

RESULTS AND DISCUSSION

1.1 Respondent Characteristics

Table 1. Characteristics of Respondents

Characteristics	Category	n	%
Gender	Male	57	34,8
	Female	107	65,2
	Total	**164**	**100**

Length of service	<5 tahun	22	13,4
	5–10 tahun	49	29,9
	>10 tahun	**93**	**56,7**
	Total	**164**	**100**
Educational level	S1	153	93,3
	S2	11	7,7
	Total	**164**	**100**
Age	<30 tahun	**20**	**12,2**
	30–40 tahun	**57**	**34,8**
	>40 tahun	**87**	**53,0**
	Total	**164**	**100**

A total of 164 elementary school teachers from 82 public elementary schools in Subulussalam City were asked to participate in the study. Two teachers were randomly chosen from each school. Regarding gender, 107 (65.2% of those who answered) were women and 57 (34.8%) were men. Regarding length of service, 93 56,7% respondents had more than 10 years of experience as teachers. Those with 5–10 years of experience accounted for 29.9%, and those with less than 5 years accounted for only 13.4%. Most of the respondents (153; 93.3% of the total) had a bachelor's degree (S1), while only 11 (6.7%) had a master's degree (S2). For age, more than half of the respondents were over 40 years old (87; 53.0%), followed bythose between the ages of 30 and 40 (57; 34.8%), and finally those younger than 30 (20; 12.2%).

1.2 Descriptive Statistics

Table 2. Descriptive Statistics

Variable	N	Mean	SD	Min	Max
GenAI utilization	164	3.72	0.61	2.00	5.00
Teacher self-efficacy	164	3.84	0.56	2.25	5.00
Teacher performance	164	3.89	0.52	2.50	5.00

When 164 elementary school teachers were asked to rate the study variables, the descriptive analysis showed that the mean scores for all three variables were high. The mean score for GenAI usage was 3.72 (SD = 0.61), with scores ranging from 2.00 to 5.00. This indicates that teachers use generative artificial intelligence at a fairly high level. A higher mean score of 3.84 (SD = 0.56) was recorded for teacher self-efficacy, with a minimum score of 2.25 and a maximum score of 5. This suggests that mostrespondents felt confident in their ability to perform their job as teachers.

Teacher performance had the highest mean score among the three variables, with a mean of 3.89 (SD = 0.52), ranging from 2.50 to 5.00. This finding indicates that the overall level of teacher performance was high. The comparatively small standard deviations across the three variables (0.52–0.61) indicate that the responses were relatively concentrated around their respective mean scores. Overall, the descriptive findings suggest that the sampled teachers demonstrated relatively high levels of Gen AI utilization, teacher self-efficacy, and teacher performance.

1.3 Reliability

Table 3. Reliability and Validity

Construct	Items	Cronbach's α	CR	AVE
GenAI utilization	6	0.891	0.917	0.648
Self-efficacy	8	0.905	0.923	0.601
Teacher performance	10	0.928	0.940	0.637

Note: α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted.

The study's reliability analysis showed that all constructs had good internal consistency. Cronbach's alpha was 0.891 and the composite reliability (CR) was 0.917 when GenAI was used. Cronbach's alpha and CR of 0.923 were found for self-efficacy were 0.905 and 0.923, respectively. Cronbach's alpha and CR of 0.928 and 0.940 respectively, were found for teacher success. All Cronbach's alpha and CR values were higher than the normal level of 0.70, indicating that all constructs had good internal consistency.

The results also showed good convergent validity. The AVE scores for using GenAI self-efficacy they were 0.601, and teacher performance were 0.648, 0.601, and 0.637 respectively. All of the AVE values were higher than the suggested level of 0.50, which means that each construct described more than half of the variation in its own indicators.

Overall, the results show that GenAI use, self-efficacy, and teacher success all exhibited good reliability and convergent validity. Therefore, the measurement model was considered adequate to study the structural model and the possible connections between the constructs.

1.4 Correlation

Table 4. Pearson Correlation Matrix

Variable	1	2	3
1. GenAI utilization	**0.805**		
2. Self-efficacy	0.612	**0.775**	
3. Teacher performance	0.584	0.683	**0.798**

The Fornell–Larcker criterion was used to check the discriminant validity of the measurement models. We found that the square root of the AVE for each construct was higher than the correlations between that construct and the others. For GenAI use, the square root of the AVE was 0.805 for self-efficacy it was 0.775 and for teacher performance it was 0.798. These numbers were higher than the inter-construct relationships that accompanied them.

Specifically, the correlation between GenAI utilization and self-efficacy was 0.612, while the correlation between GenAI utilization and teacher performance was 0.584. The correlation between self-efficacy and teacher performance was 0.683. Since the diagonal values were consistently higher than the correlations in the corresponding rows and columns, the three constructs demonstrated adequate discriminant validity.

Therefore, GenAI utilization, self-efficacy, and teacher performance can be empirically distinguished from one another, supporting the adequacy of the measurement model for subsequent structural analyses.

1.5 Multiple Regression

Table 5. Multiple Regression Analysis

Predictor	B	SE	t	p
Constant	0.842	0.214	3.935	<0.001
GenAI utilization	0.286	0.071	4.028	<0.001
Self-efficacy	0.471	0.068	6.926	<0.001

Note: β = regression coefficient; SE = standard error; t = t-statistic; p = significance level.

The regression analysis shows that using Gen AI and teachers' confidence in their abilities positivel and significantl aeffect how well they perform their jobs. The model coefficient for Gen AI use was $\beta = 0.286$, with $t = 4.028$ and $p < 0.001$. Higher levels of GenAI use are linked to higher levels of teacher performance, according to this finding. This means that using GenAI improves teacher performance in a way that is both good and statistically significant.

Similarly, teacher self-efficacy had a positive and significant impact on teacher performance, as shown by the regression coefficient of $\beta = 0.471$, $t = 6.926$, and $p < 0.001$. Based on this finding, teachers with higher levels of self-efficacy tend to do a better job. Self-efficacy had a larger standardized regression coefficient than GenAI, suggesting that it made a bigger difference in how well teachers perpormed in the model.

Overall, these findings indicate that both GenAI utilization and teacher self-efficacy are significant and positive predictors of teacher performance. The results suggest that enhancing teachers' ability to utilize generative artificial intelligence, together with strengthening their confidence in their professional capabilities, may contribute to improved teacher performance.

Discussion

The results of this study show that using GenAI and teachers' confidence in their own abilities have positive and significant effects on how well they do their jobs. These results suggest that teachers' performance is affected by more than just their professional and pedagogical skills. It is also affected by how well they can use new technologies and their confidence in their professional skills.

1. Effect of GenAI Utilization on Teacher Performance

A regression coefficient of $\beta = 0.286$, $t = 4.028$, and $p < 0.001$ showed that using GenAI has a positive and significant effect on how well teachers perform their jobs. According to this study, better teacher performance is often linked to higher levels of Gen AI use. Generative AI can function as a supportive resource for teachers in performing various professional activities, including lesson planning, instructional material development, generation of learning activity ideas, assessment design, identification of alternative teaching strategies, and reflection on their teaching practices.

This finding can be understood from the perspective of technology-enhanced teaching, which sees technology not just as a technical tool but also as a resource that can help teachers do their jobs better. GenAI can help teachers complete intellectual and

administrative tasks faster, which could give them more time and energy to engage in teaching activities that require professional judgment, creativity, social interaction, and knowledge of what each student needs.

The size of the coefficient ($\beta = 0.286$) also shows that using GenAI to help teachers do their jobs has a noticeable but not overwhelming effect. This is important because using technology does not always improve things. How, why, and how well teachers use GenAI significantly aeffects its functioning. GenAI use which is mostly focused on finishing administrative tasks might not always improve the quality of teaching. However, Gen AI may be more useful when it is purposefully combined with professional reasoning and learning goals.

The results also show that GenAI should be seen as a tool to help teachers perform their jobs, not as a replacement for them. Teachers are still in charge of ensuring that the information created by AI is correct, adapting materials to fit the needs of each student, considenring the local educational setting, and ensuring that AI use follows ethical and academic integrity standards. Because of this, teachers should learn more about AI, how to use technology, how to think critically, and how to be ethically aware as GenAI is used more.

2. Effect of Self-Efficacy on Teacher Performance

With a regression coefficient of $\beta = 0.471$, $t = 6.926$, and $p < 0.001$, teacher self-efficacy had a positive and significant effect on how well teachers did their jobs. It was found that self-efficacy had a larger regression coefficient than Gen AI utilization. This means that teachers' beliefs in their own abilities are a better predictor of their performance in the model.

This finding can be explained by Bandura's Social Cognitive Theory. This theory states that self-efficacy is a key factor in how people choose actions, set goals, work hard, and keep going when things get tough. In the classroom, teachers with a lot of self-efficacy are more likely to show confidence in planning and carrying out lessons, dealing with students from different backgrounds, trying out new teaching methods, and looking for answers when problems arise during lessons.

Strong self-efficacy also makes teachers more likely to believe that professional problems can be overcome through hard work, learning, and building their skills. On the other hand, teachers who do not believe in their own abilities may feel more uncertain when they have to deal with changes in the curriculum, new technologies, administrative demands, or students' needs that are becoming more varied.

The coefficient of $\beta = 0.471$ indicates a relatively substantial contribution of self-efficacy to teacher performance in this model. Given this finding, teacher professional development should not just focus on teaching teachers new information and technical skills; it should also help teachers feel more confident in their ability to use those skills successfully.

3. Comparing the Effects of GenAI Utilization and Self-Efficacy

An important finding of this study is that self-efficacy has a larger regression coefficient than GenAI utilization (0.471 vs 0.286). This suggests that teachers' internal psychological factors contribute more to teacher performance than the direct utilization of GenAI.

This finding has important theoretical implications. Technology can provide teachers with additional resources, but its effectiveness ultimately depends on the capabilities of the people who use it. Teachers with higher self-efficacy may be more willing and able to explore GenAI functions, critically evaluate AI-generated outputs, adapt AI-generated content to instructional needs, and integrate AI into pedagogical practices.
Thus, technology and teachers' psychological characteristics should not be regarded as independent factors. GenAI utilization and teacher self-efficacy can be viewed as complementary resources. GenAI provides technological support, whereas self-efficacy provides the psychological confidence and motivational capacity necessary to use this support effectively. The combination of these factors may facilitate more adaptive, productive, and innovative teaching practices in the future.

4. Implications for Teacher Professional Development
The findings have practical implications for teache professional development of teacher, particularly among elementary school teachers in Subulussalam City. Professional development programs should not merely provide technical training on how to operate various GenAI applications but should also develop teachers' confidence in integrating these technologies into instructional practices.
GenAI training can be structured progressively, beginning with fundamental AI concepts and prompt development, followed by the use of GenAI for lesson planning, instructional material development, assessment design, and evaluation and verification of AI-generated outputs. Simultaneousl, training should provide teachers with opportunities to experience successful implementation through hands-on practice, peer learning, mentoring, and reflective activities.
This approach is important because mastery experiences are one of the primary sources of self-efficacy development. When teachers successfully apply Gen AI to authentic instructional tasks, they may become more confident in their ability to use technology as part of their professional practice.
Therefore, the findings support a professional development approach that integrates AI competency, pedagogical competency, and self-efficacy development rather than focusing exclusively on technical training.

5. Theoretical Implications
The results provide real-world evidence to support the idea that technological and psychological-professional factors affect how well teachers perform their jobs. Self-efficacy is an internal factor that affects teachers' ability and willingness to use available resources successfully, whereas GenAI utilization is an external technological resource that can help teachers with their professional work.
The results also show that Social Cognitive Theory is still useful for understanding how teachers do their jobs in a world going digital. This view state that teachers' actions at work are affected by both their personal and professional technological environments, especially their beliefs about their own abilities.
Therefore, bringing Gen AI into schools should be done in a way that puts people first, where new technology is paired with investments in teachers' professional skills, trust, judgment, and sense of right and wrong.

6. Overall Synthesis

Overall, the results show that using Gen AI and teachers' confidence in their own abilities are strong predictors of how well they will perform their jobs. The strong effect of self-efficacy suggests that teachers' performance is still heavily reliant on how confident they are in their own professional abilities. The significant effect of Gen AI utilization suggests that generative AI has the potential to help teachers with their work.

Therefore, improving teacher performance in the GenAI era cannot be achieved simply by providing access to AI technologies. A more comprehensive intervention is required that combines the development of Gen AI literacy and practical competencies with systematic efforts to strengthen teacher self-efficacy. Such an approach can enable teachers to become not merely technology users but also critical, reflective, ethical, and pedagogically purposeful users of generative AI.

Limitations

This study has several limitations.

First, the cross-sectional design limits the causal inference. Although regression analysis can identify statistical associations, longitudinal or experimental designs would provide stronger evidence of causality.

Second, self-reported measures may introduce common method bias. Future research should combine teacher questionnaires with principal evaluations, classroom observations, teaching documents and student-level outcomes.

Third, GenAI technologies are rapidly changing. Therefore, the findings may be influenced by the specific AI tools and the teachers' level of familiarity during the data collection period.

Fourth, the study was conducted in one city, limiting its generalizability to other Indonesian regions.

Future research should employ longitudinal designs, multilevel models, or intervention studies to determine whether structured Gen AI professional development produces measurable improvements in teacher performance.

CONCLUSION

The results of this study show that using Gen AI and teachers' confidence in their own abilities have positive and significant effects on how well elementary school teachers in Subulussalam City perform their jobs. GenAI use makes a big difference in how well teachers do their jobs, which means that using generative AI can correctly help teachers with their professional, management, and teaching tasks. On the other hand, teacher self-efficacy had a lager positive effect on teacher performance. This suggests that teachers' faith in their professional skills is a key factor in achieving better results.

Furthermore, the results show that self-efficacy is a better indicator of how well a teacher will perform than GenAI use. This implie that new technologies alone are insufficient to improve teachers performence. GenAI is more likely to help teachers if

they are professionally competent, have confidence, can think critically, and know how to use AI in a useful way in their lessons.

In this age of generative AI, efforts to improve teacher performance should use a combined method that includes GenAI skills, teaching skills, and teacher confidence in their own abilities. Professional development programs should not only teach teachers how to use GenAI technically, but also provide ongoing support, hands-on experience, opportunities to think about what they are learning, and opportunities to feel confident in their ability to use AI in a moral and useful way. This way of doing things can help teachers become skilled, flexible, self-aware, and able to use GenAI to improve the quality of education without taking away their professional freedom and teaching judgment.

Conflict of Interest declaration

The authors declare that they are not connected to or part of any group or organization that has a financial stake in the topics or materials discussed in this manuscript.

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