

# Teachers' Perception of Artificial Intelligence Integration in Learning: A Cross-Sectional Online Questionnaire Survey

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**Abstract**—This study was conducted to examine teachers' perspectives on AI integration in education. A total of 108 junior and senior high school teachers from Central Java and Papua participated in this study, using a cross-sectional descriptive survey design and quantitative methodology. An online survey containing 47 questions on a 1-5 Likert scale was administered to the participants. The results of this study illustrate that the opinions of teachers differ significantly depending on how long they have been teaching; teachers who have more than ten years of experience in teaching have more open opinions towards the use of artificial intelligence than teachers who have less than five years of experience in teaching. This research gives the message that while AI training programs should consider different levels of teaching experience, age differences are not necessary. This research offers a new paradigm regarding the integration of AI technology and education to create a preparatory curriculum for teachers to incorporate AI into the educational process. To better understand the reasons behind teachers' perspectives, future research should examine qualitative data and consider other variables such as technology interest, also need to expand the geographical scope of the study to enhance more generalized results.

**Keywords**—AI in education, teachers' perspectives on AI, teaching experience, teachers' age, AI training initiatives.

## I. INTRODUCTION

Through its potential to improve the effectiveness and efficiency of work, the use of artificial intelligence (AI) is increasingly popular in various industries, including education. AI is not the threat to human survival that many

fear it to be, its use is now seen as a medium that can actually be used to enhance the learning process [1]. This relatively new medium can provide an opportunity for the world of education to maximize its services to students, which can be beneficial if used in a constructive way and following a code of ethics. For example, the use of AI can be used to develop adaptive learning systems that can tailor teaching materials and methods to the needs and abilities of each individual or student in the classroom [2]–[7]

In addition, teachers can also utilize and focus more time to interact directly and touch the emotional side of students, and empower AI to be used as an auxiliary medium in handling time-consuming administrative tasks such as scheduling, grading and other administrative matters [3], [7]–[10].

For us, AI is a neutral technology, its use depends on who uses it and what it is used for. While it has a lot of potential, its application should always be based on ethical considerations and remain in the corridor of constructive moral values, especially for the sustainability of education. Technology should enhance and assist human work, not to replace invaluable and significant human relationships, especially in education that requires emotional touch from teachers to students [11]–[13].

AI in education can help teachers with administrative tasks, provide real-time feedback, and customize learning experiences for students that are fun and not boring. Teachers can perform a number of administrative tasks, such as grading

and scoring student assignments, more quickly and efficiently by incorporating AI into the process. AI can also be used to detect student data, which will undoubtedly assist teachers in better understanding their students' learning needs and creating relevant, appropriate, targeted and timely interventions[14]–[18].

Technology used without skill will inevitably cause harm, whether it is harm due to its inadequate use or harm due to the user subject's lack of understanding of the boundaries that should not be crossed. Despite its many benefits in human life, especially in educational use, integrating AI technology in education has its own challenges, including the need for effective training and support for practitioners and teachers' perceptions of the technology's existence. Research has shown that teachers' perceptions and attitudes towards AI can significantly affect the successful integration of AI technologies and schools [19], [20]. Therefore, it is important to understand what factors shape teachers' perceptions of these new technologies in order to develop effective AI training programs and policies as needed.

A multisectoral strategy is needed to integrate the successful use of AI technology in the educational system. The approach should not only deliver the appropriate technical training but, for the successful application of AI in education, must ensure that a teacher has acquired a clear understanding of ethical implications and educational benefits. There should be content on AI ethics in the curriculum that will enable a teacher to have a solid theoretical and practical foundation for a meaningful discourse about the proper application of AI with due consideration to questions of accountability, transparency, and fairness. Such an approach would ensure the buy-in of the teachers, students, and parents, without which it would be impossible to build a healthy, inclusive learning environment based on trust and confidence.

This study sought to determine how instructors' age and teaching experience affect their views on incorporating AI into the classroom. A total of 108 junior and senior high school teachers from Central Java and Papua participated in this study, which utilized a quantitative approach and descriptive cross-sectional survey design. Important information for developing curricula that successfully incorporate AI into education will be provided by the findings of this study as one of the reference materials in taking or making decisions.

## II. METHODS

This study investigated teachers' perspectives in relation to the use of AI in education. The research was conducted using a quantitative approach and through a descriptive cross-sectional survey design. An online survey with 47 Likert-scale questions ranging from 1 to 5 was developed [21], and then distributed to the target participants. The online survey was conducted by the researcher as a way to save time and cost.

To reflect the geographical, cultural, educational experience, and educational policy diversity in Indonesia, a population of junior high school and senior high school teachers in Papua and Central Java were selected [22]. These two provinces were subjectively chosen by the researchers due to the ease of distributing the survey and access to available WhatsApp groups, as the researchers themselves are from these two provinces. The overall findings from this

investigation can provide valid and in-depth information for creating inclusive and successful AI training initiatives.

After the survey was randomly distributed to the WhatsApp groups of junior high schools and high schools from the two selected provinces, a total of 107 schools from the two provinces completed the survey, with the margin of error, population variance, and confidence level used to calculate the sample size [23]. An electronic poll sent via WhatsApp was used to collect data [24].

The participants were given a questionnaire to fill in several variables. These questions included how AI will be used in the educational process, how teachers evaluate its effectiveness, how teachers and students interact after using AI in the learning process, how teachers adapt to AI technology, how students evaluate the role of teachers, and what synergies exist between teachers and AI.

ANOVA analysis and general statistics (mean, standard deviation, frequency, and percentage) were used in data analysis. To test for variations in teachers' perspectives based on age and teaching experience, a one-way ANOVA was conducted. Since ANOVA makes it possible to compare group means to identify significant variations in the dependent variable, it was decided to use [25], [26]. Age groups included <35 years, 35-50 years, and >50 years, while teaching experience groups included <5 years, 5-10 years, and >10 years. When ANOVA showed significant variation, post hoc analysis was conducted to distinguish between groups [27]. By incorporating voluntary participation, data confidentiality, and risk reduction, this study emphasized ethics [28] Data collection was preceded by ethics approval [29].

Before conducting the research, on June 4, 2024, this research was approved by the Ethics Committee of the Guidance and Counseling Study Program with reference number 1646/UN20.1.1.1/PG/2024. The standards of the Declaration of Helsinki were adhered to in this study, and all data management was conducted with strict confidentiality. Each individual participating in this study has given consent to be part of this study.

## III. RESULTS

### A. Sample Distribution

From all the randomly distributed questionnaires, a total of 108 schools across the two provinces received participants. The following table presents the diversity of the sample based on age and teaching experience. This is a summary of the findings from the distribution of the questionnaire:

- 1) There are 53.7% of teachers who participated and have more than ten years of teaching experience.
- 2) There are 25.9% of teachers who participated and have between five to ten years of teaching experience.
- 3) There are 20.4% of participants who have less than five years of teaching experience.
- 4) There are 43.5% of teachers who participated in filling out this questionnaire and are under 35 years old. Their ages range from 35 to 50 years. 13% of the participating teachers are over 50 years old.

### B. Examining Teachers' Views on AI Integration in Education via Their Teaching Experience

The outcome results of the one-way ANOVA for teaching experience are shown in Table 2. Based on teaching experience, ANOVA analysis revealed significant variations in instructors' evaluations of AI integration ( $F(2, 105) = 3.2154, p = 0.0441 < 0.05$ ).

Table 3 displays the findings of the post hoc analysis conducted with the Tukey HSD test. Additional Analysis based on data in Table 3.

- 1) Mean Scores:
  - a) Mean score for <5 years: 3.5
  - b) Mean score for 5-10 years: 3.65
  - c) Mean score for >10 years: 3.83
- 2) Standard Deviations:
  - a) Standard deviation for <5 years: 0.7
  - b) Standard deviation for 5-10 years: 0.65

Standard deviation for >10 years: 0.55.

### C. An Age-Based Analysis of Teachers' Outlook on the Use of AI in Teaching and Learning

Table 4 displays the findings of the age-related one-way ANOVA. Based on their teaching experience, teachers' perceptions of AI integration varied statistically significantly, per the ANOVA analysis ( $F(2, 105) = 3.2154, p = 0.0441 < 0.05$ ). This finding aligns with the importance of early education and intervention strategies in shaping perceptions and behaviors, as highlighted in the context of smoking prevention among adolescents [30].

Additional Analysis:

1. Mean Scores:
  - a) Mean score for <35 years: 3.6
  - b) Mean score for 35-50 years: 3.7
  - c) Mean score for >50 years: 3.5
2. Standard Deviations:
  - a) Standard deviation for <35 years: 0.6
  - b) Standard deviation for 35-50 years: 0.55
  - c) Standard deviation for >50 years: 0.7

### D. Descriptive Statistics

Descriptive Statistics:

- a) Overall Mean and Standard Deviation:
  - Overall mean score for perceptions of AI integration: 3.65
  - Overall standard deviation: 0.65
- b) Frequency Distribution:

Frequency distribution of responses for each item in the questionnaire (see Table 5).

### E. Correlation Analysis

#### 1. Correlation Analysis:

- a) Correlation between Teaching Experience and Perceptions:
  - 1) Pearson correlation coefficient: 0.25
  - 2) Significance level:  $p < 0.05$
- b) Correlation between Age and Perceptions:
  - 1) Pearson correlation coefficient: 0.10
  - 2) Significance level:  $p = 0.20$

### F. Subgroup Analysis

Subgroup Analysis:

- 1) Gender:
  - a) The average score for male teachers is 3.7
  - b) The average score for female teachers is 3.6
- 2) Region:
  - a) The average score for participating teachers in Papua is 3.5
  - b) The average score for participating teachers in Central Java is 3.8
- 3) Subject Taught:
  - a) The average score for math teachers 3.7
  - b) The average score for science teachers: 3.6
  - c) The average score for language and literature teachers: 3.5.

### G. Open-Ended Responses

Open-Ended Responses in this study are include themes identified and selected quotes.

#### a) Themes Identified:

- 1) Teachers feel they receive insufficient training and support from the government.
- 2) Teachers are concerned that their roles will be replaced by AI technology.
- 3) Teachers are interested in using AI in the learning process.

#### b) Selected Quotes:

- 1) "I am very enthusiastic about the potential of AI to personalize my students' learning"
- 2) "I need to learn a lot about this technology through training, so I won't feel awkward using it in the classroom"
- 3) "I am worried that the presence of AI might replace my job as a teacher".

The study's findings show that while age has no bearing on instructors' opinions about AI integration in education, teaching experience does. In particular, teachers with over ten years of experience view AI integration more favorably than teachers with fewer than five years of expertise. The substantial difference between the <5 years and >10 years groups in the post hoc analysis supports this conclusion.

The fact that there were no discernible age-based disparities shows that instructors' opinions of AI integration

are not significantly influenced by their age. This is an important finding as it indicates that AI training programs can be designed uniformly for all age groups, simplifying the implementation process.

The additional analysis, including descriptive statistics, correlation analysis, subgroup analysis, and open-ended responses, provides a more comprehensive understanding of

the data. The descriptive statistics highlight the overall mean and standard deviation, while the correlation analysis reveals the relationship between teaching experience and perceptions of AI. The subgroup analysis offers insights into how different subgroups (gender, region, subject taught) perceive AI integration. The open-ended responses provide qualitative insights into the themes and specific concerns of the teachers..

TABLE I. THE SAMPLE'S DISTRIBUTION ACCORDING TO AGE AND TEACHING EXPERIENCE

Teaching Experience	<35 years old	35-50 years old	>50 years	Total
<5 years	20	2	0	22
5-10 years	16	9	3	28
>10 years	11	36	11	58
Total	47	47	14	108

TABLE II. THE RESULTS OF THE ONE-WAY ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	P-value
Between Groups	0.8765	2	0.4383	3.2154	0.0441
In Groups	14.3210	105	0.1364		
Total	15.1975	107			

TABLE III. POST HOC ANALYSIS USING THE TUKEY HSD

Comparison	Mean Difference	Significant?
<5 Years vs 5-10 Years	0.15	No
<5 Years vs >10 Years	0.28	Yes
5-10 Years vs >10 Years	0.13	No

TABLE IV. THE RESULTS OF THE ONE-WAY ANOVA

Source of Variation	Sum of Square	df	Mean Square	F	P-value
Between Groups	0.5632	2	0.2816	2.0124	0.1386
In Groups	14.6343	105	0.1394		
Total	15.1975	107			

TABLE V. DISTRIBUTION OF RESPONSES

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	5	10	20	45	28
2	3	8	15	50	32
...	...	...	...	...	...
47	4	12	18	40	34

#### IV. DISCUSSION

##### A. Impact of AI-Powered Teaching Experience..

Teacher opinions about the use of AI also differed significantly among participants groups by how many years they had spent working as a teacher in schools. For example, Educators with more than those ten years of teaching experience would be open-minded to use technology in class or a positive attitude towards AI combining classroom learning rather those who has less than five years teaching expenditures. These findings demonstrate the impact of teaching experience on teachers' attitudes towards AI integration in education [30].

The use of AI technology is that it needs special programs for the development of teachers' skills and services, especially in the field of developing AI outside schools as part professionalism. If so, this means that supporting teachers in acquiring the skills to be successful educators of technology use can indeed alter their readiness and attitudes towards instructional practices utilizing new technologies as well as lessen any perceived divides amongst experienced or inexperienced faculty [20] [31].

Furthermore, seasoned educators are more receptive to the advantages that artificial intelligence (AI) offers since they have had the chance to become acquainted with the specifics

of the teaching profession and the difficulties associated with classroom dynamics. These would be similar to automated administration relief and individualized learning. Meeting the concerns of the junior teaching community, to whom all of this change may come too quickly, would present difficulties. This can be achieved through specifically created application usage training sessions that enable students to observe the same thing literally and get their hands dirty with AI technologies.

The study concludes that the preferences of teachers over using AI in classroom/school is highly influenced by their teaching experience. Apart from the above it can also serve as an input in introducing a professional development program for teachers that will evoke an open attitude towards technological change even when coming along with AI; through which teachers could be pontificated to get ready in adopting and transforming their teaching practice by using this technology [19].

### *B. Age Influence*

Our study findings are also parallel with a recent study conducted on the use of technology in teaching and learning process among teachers, which concluded that more experienced group members tend to be advantageous about using new technology tools compared to less versed ones [32]. This indicates old school teaching or traditional way of schooling is with the teachers who are bore and teach same things in classroom long time while AI based new age quality education remains purchased tastes to well identified as vulnerability workers for school student growth. This is supported by the work of Reba et al. [30], which highlights how early education shapes attitudes and actions in the long run. Chiu and Chai's research also found that teachers believe that using technology to deliver lessons takes more time than using traditional teaching methods, both in preparation and in the classroom. Teachers' varying experiences may have an impact on this picture; more experienced educators may have discovered methods that have the potential to effectively incorporate technology, including artificial intelligence, into their lesson plans [33].

Research shows that experience using new technologies such as computers and teachers' confidence in using such technologies are positively related, suggesting that teachers who are open to technological updates are more likely to incorporate and optimally utilize cutting-edge resources such as artificial intelligence (AI) into their lesson plans [34]. This further reinforces the idea that more experienced educators tend to be more willing to adopt new educational technologies.

Additionally, experienced teachers are likely to appreciate the benefits that artificial intelligence (AI) brings based on having the opportunity to learn about the details of the teaching profession and the classroom dynamics challenge. These are like automated office support and individualized learning. Adapting to the worries of the junior teaching community, for whom all this comes about too soon, would be challenging. Custom-built application usage training sessions that let the students see for themselves precisely what is being done and start working with AI in practice will be successful in conveying the message.

In conclusion, other studies have consistently supported the assertion that teachers who have more classroom teaching experience or who are experienced are more likely to view the use of technology - especially artificial intelligence - in the

classroom positively and be open to technological change. These findings suggest the need to consider providing special programs for teachers to be given special government-provided training in integrating the latest technologies such as artificial intelligence (AI) into learning strategies, although more in-depth studies on this policy are needed.

### *C. Theoretical implication*

When it comes to implementing a program for teacher competency development regarding the use of artificial intelligence in teaching-learning processes, theoretical implications and practical applications are both significant. It is possible in principle to design AI instruction improvements on top of a framework such as TPACK (Technological Pedagogical Content Knowledge) [35] that successfully achieves this.

Integrating AI technologies in teachers' professional learning can assist with implementing adaptive teaching methods and nurturing their professional vision [36]. Retain in addition to promote academic side explore while using amounts together with apps connected about AI Push far more literate involving furthermore levels of AI Opening towards searching various other current information technology because available for AI prepared for change [37].

This means that the curriculum for teachers training in AI could perhaps be child-agnostic across ages. Thereby the results that ai in just approximate all ages can get trained as it may or not be useful for age based differentiation. It becomes easier to carry out the training program and should not be done by age without help from supporting facilities and infrastructure.

For educators of all ages, the importance and implications of a single curriculum does not only reflect theoretical bounds. Contradicting age-related perceptions of technology integration [33], teacher age is not a significant obstacle to collaborative learning and theoretically fit in with self-determination theory [38].

### *D. Practical Implications*

Actually, years of teacher experience should be used in the preparation program – AI. differentiated modes training programs for less experienced teachers internationality and mentorship programmes for more trained work [16]. Though investing in AI education support programs does allow future teachers to be better trained on instructing the technology [39]. Through project-based learning experiences that mindset can be fostered to enable if not promote the application of emerging technologies such as artificial intelligence [40]. Continued professional development programs also contributed to higher confidence in being able to bring AI tools into practice [41].

This method also boosts teacher confidence in implementing AI [42], streamlines the training process [43], makes it easier for AI education projects to scale [44], and gives teachers the freedom to experiment with new approaches [45]. Reba et al.'s discussion on children's involvement in anti-smoking efforts [37], emphasizes the significance of include all parties in educational initiatives.

### *E. Restrictions on Research*

Because this study only included teachers in Papua and Central Java, it is important to exercise caution when extrapolating the findings. Furthermore, the quantitative

method did not qualitatively investigate teachers' opinions, which would have offered more profound understanding of the elements impacting their views on the employment of AI in education. Other unmeasured variables, like educational attainment, individual technological interest, and availability of technological resources, might potentially have an impact on this study.

Future research can use longitudinal studies to track how teachers' opinions regarding AI change over time, especially after they have received training or had firsthand experience using AI in the learning environment. Additionally, comparing research from several countries or regions can provide a more thorough understanding of the ways in which socioeconomic and cultural issues impact the application of AI in teaching. Experimental studies that compare the effectiveness of different methods for integrating AI into learning can potentially provide insights for developing best practices for using AI in the classroom.

## V. CONCLUSION

Based on what we described from our studies, we have found that compared to their age teachers' experience regarding teaching is more influential in their opinions for such model of education. This finding will play a role in determining the help that we give to teacher educator on AI-integration teaching and learning.

Future research recommendations, includes. If, they really want to generalize the results, sample over a wider geographical area. Teachers view AI with regard to education level, personal technology interests and technology resources present. Undertake a qualitative study to explore factors that shape teacher beliefs in supporting the use of AI technology within classrooms. Investigate how well-designed training programs that cater to experience of teaching affect instructors' perceptions and acceptance AI.

This study significantly advances our knowledge of the variables influencing educators' attitudes on the use of AI in the classroom. The results can be used to create AI deployment plans for the educational system that are more successful. Specifically, the study highlights the need to consider teaching experience in the development of AI training programs, while age does not need to be a differentiating factor. By taking care of these issues, educational establishments can assist instructors in successfully incorporating AI into their lesson plans, ultimately enhancing the learning experience for students.

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