Exploring the Relationship between Teacher Attitudes towards Technology Integration in the Classroom

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Abstract

Technology integration in education has become a major concern in modern curriculum development. English teachers play an important role in the successful implementation of technology in the classroom, and their attitude towards technology is a key factor influencing how well it is integrated. This study was conducted to explore the relationship between English teachers' attitudes towards technology and the level of technology integration in teaching, focusing on English teachers in 17 schools spread across four districts. The study utilized a mixed method approach involving both qualitative and quantitative data collection. Qualitative data was collected through in-depth interviews with English teachers, while quantitative data was obtained through a questionnaire distributed to all English teachers in the schools. Data analysis was conducted using triangulation techniques to ensure the reliability and validity of the research results. In addition, this study also measured how English teachers' attitudes towards technology relate to the use of technology in daily teaching. The results show that there is a significant relationship between English teachers' attitudes towards technology and the level of technology integration in the classroom. English teachers who have positive attitudes towards technology tend to be more active in integrating technology into their teaching, while English teachers with more skeptical attitudes tend to make less effective use of technology. The study concludes that in order to improve technology integration in teaching, efforts need to be made to change English teachers' negative attitudes towards technology through adequate training and support.

Keywords: *English teacher attitudes; technology integration; classroom*

Introduction

These days, technology plays a major role in our daily lives (Batubara 2021). Almost all aspects of human life are related to technology, from simple things to crucial things. Recent years have seen a fast improvement in technology, which has an impact on many facets of human existence, including education (Syathroh 2022). This is no exception in the realm of education which has used technological advances as part of learning. ICT has already fundamentally altered how people communicate and go about their everyday lives in many different disciplines, including education. Access to technology, computer-assisted instruction, and technology-enabled behavioral interventions are a few examples of technology-based approaches to education that can enhance instruction and support effective teaching and learning (Escueta et al. 2020). It has also altered the responsibilities that teachers and students play in teaching and learning (Abdelaziz 2013). The manner that ICT has transformed traditional teaching methods is evidence of its revolutionary. impact on education. Students' speaking, listening, reading, and writing abilities can all be enhanced by incorporating technology into EFL classes, but for best results, it needs to be thoughtfully considered and planned for (Kumar 2022). With a constantly growing spectrum of devices and methodologies, educational technology improves learning experiences in a variety of settings, including formal, informal, and non-formal learning (Huang, Spector, and Yang 2019).

The use of digital tools and online resources has expanded knowledge beyond classrooms and fostered collaborative learning. Technology enables English teachers to guide students through vast information, fostering student involvement in their own learning. This shift enhances education and equips students with essential digital-age skills like adaptability and technical literacy. Using integrated technology in the classroom improves the quality of instruction and gives students a digital passport that encourages self-improvement and self-direction (Valdemir da Silva 2023). Technology implementation also requires a careful approach. It is not just limited to incorporating hardware and software into the curriculum, but also involves adequate training for English teachers to be able to effectively integrate technology in their daily teaching. Successful use of technology in education relies not only on available equipment but also on the teacher's ability to manage and use it effectively to support learning. The important elements that assist technology integration in classrooms include a teacher's familiarity with the technology, their availability, their frequency of usage, and their quality of support (Liu et al. 2017).

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Teachers' Attitudes towards Technology

A teacher's use of technology in the classroom is influenced by a number of significant aspects, including their attitudes, infrastructure, technical support, and instructional help (Khlaif 2018). In order to support students' learning, teachers' perspectives must shift, necessitating better professional development and teacher education initiatives (Ertmer and Ottenbreit-Leftwich 2010). Increased comfort with new technologies and a stronger commitment to reform-based teaching are two benefits of technology-enhanced professional development for teachers, which improves teaching effectiveness and efficiency (Blanchard et al. 2016). Teachers' motivation to enhance the use of ICT in the classroom needs to be increased through the development of more tangible opportunities, support, and encouragement (Uluyol and Şahin 2016).

Technology must be integrated to enhance learning quality and reduce reliance on English teachers as the sole learning source. The concept of technology integration can be seen from two terms, namely integration and technology. According to the Indonesian dictionary, the word integration means unification (until it becomes whole). Meanwhile, technology comes from the Greek "techne" which means method and "logos" which means knowledge, and can be interpreted as knowledge about methods. By looking at the meaning of these two words, technological integration means unification, combining knowledge and methods.

Using technological to enhance teaching and learning is known as technology integration in the classroom. It involves seamlessly integrating technology to enhance learning, making it more relevant, effective, and engaging. Schools use educational software, from basic language games to advanced applications. LMS platforms like Google Classroom, Moodle, and Blackboard facilitate the management of course materials, communication between teachers and students, and the tracking of student progress. Another significant technological advancement in education is the use of **Tablets and Laptops.** These mobile devices allow students to access information and resources anytime, supporting self-directed learning and enabling personalized content to fit individual needs. Online Collaboration Tools, such as Google Docs and Microsoft Teams, enable students and teachers to work together in real-time, regardless of physical location. These tools have become increasingly important in promoting collaborative learning and facilitating group projects. Artificial Intelligence (AI) is beginning to shape the future of education. AI-driven applications personalize learning, offer instant feedback, and adapt to each student's pace and style. Adaptive learning systems use AI to analyze student data and adjust content and assessments to better meet individual learning needs. Utilizing technology to improve the overall education process and prepare students for the digital age is the goal. (Sutrisno. et all, 2024)

Global education roadmaps can help accomplish the knowledge, mobility, and collaboration capabilities that the twenty-first century demands (Chu et al. 2016). The iPod and iPad are two examples of new technology that have the potential to

completely transform education by improving 21st-century student productivity, learning, and communication (Richards and Renandya 2011). The integration of information technology in learning not only equips students with advanced skills but also fosters critical thinking, collaboration, creativity, effective communication, and a positive learning environment. This enjoyable atmosphere helps students better retain what they learn by leaving a lasting impression.

According to Ajzen (2001), Attitude represents a summary evaluation of a psychological object (the 'attitude-object'), captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likeable-dislikeable (Wijnen, Walma van der Molen, and Voogt 2024). The greatest factors influencing ICT use include positive views toward ICT as a helpful teaching and learning tool and a high sense of self-efficacy in utilizing computers in the classroom (Player-Koro 2012). The cognitive component is in the form of perceptions and beliefs. The affective component involves emotional aspects, while the conative component is an aspect of the tendency to act. The positive attitude referred to here is the cognitive component and the conative component. the cognitive component here is an open attitude, teacher acceptance of the presence of technology. The conative component is the teacher's adaptive attitude and actions regarding technology in the learning process.

English Teachers who have a positive attitude tend to create inspiring classes and motivate students to learn. The English teacher's positive attitude fosters a friendly atmosphere that makes students feel valued and motivated to engage actively in learning. This includes the English teacher's attitude towards the use of technology in the classroom. Teachers' willingness to provide support and provide constructive feedback is also a key element that strengthens the positive impact their attitudes have on students' learning experiences (Johnson et al., 2018). Creating a supportive environment boosts student engagement and fosters a growth mindset, helping students feel confident to take risks and learn from past mistakes.

With the development of contemporary education, it's crucial to recognize that English teacher attitudes encompass both interpersonal aspects and technology adaptation. Technology integration is directly impacted by teacher educators' understanding of it and how to integrate it, while attitudes of its worth have an indirect impact (Taimalu and Luik 2019).

They adopt a forward-thinking approach that enhances traditional teaching and equips students with essential digital literacy skills. This adaptability demonstrates their commitment to preparing the next generation for a rapidly changing technology landscape, creating a dynamic learning environment that meets today's evolving demands and ensures students have the skills to succeed in a digital age. The possibility to raise teaching and learning standards is one of the factors driving educators' decisions to embrace and incorporate ICT in the classroom (Lawrence 2018). By embracing technology, educators can help students

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develop critical thinking, problem-solving, and digital literacy, which are crucial for success in the 21st century.

While various studies have examined factors that influence technology adoption, such as infrastructure and technical support, there are still few studies that specifically explore the relationship between teachers' attitudes and the level of technology integration in the classroom. This is especially true of studies that focus on English language teachers. Based on this gap, this study aims to examine how teachers' attitudes towards technology affect their level of integration in the English classroom. This research not only explores general trends, but also examines whether positive attitudes contribute to more effective and in-depth use of technology, while negative attitudes hinder technology adoption.

The main purpose of this study is to analyze the relationship between English teachers' attitudes towards technology and the level of technology integration in the classroom. This study attempts to answer the question "How does the relationship between teachers' attitudes towards technology affect their willingness to integrate technology in learning activities?"

The hypotheses proposed in this study are as follows:
H1: There is a positive correlation between teachers' positive attitude towards technology and the level of technology integration in the classroom.
H2: Teachers with negative attitudes tend to be less effective in integrating technology, resulting in limited adoption of technology.

Method

In order to gain a thorough understanding of the relationship between English teachers' attitudes and technology integration in the classroom, a mixed methods approach was used. Mixed methods focus on collecting and analysing data and combining quantitative and qualitative data in both single studies (Creswell 2016). The characteristics of the research model are that quantitative data is more important than qualitative data, qualitative data is secondary data which is supporting quantitative data, and qualitative data serves to justify quantitative data (Creswell 2016). In order to provide readers a deeper grasp of the issue, mixed-method approaches merely combine qualitative and quantitative methodologies according to the goals of the study and the nature of the research question (Taherdoost 2022). The research included qualitative information from in-depth interviews. Qualitative method is a method with a research process based on the perception of a phenomenon with the approach that the data produces descriptive analysis in the form of oral sentences from the object of research (Sahir 2021). And quantitative information collected from a survey. This study used **random sampling** to ensure that every school and teacher had an equal chance of being selected. From the total population of schools in four districts, **17 schools were randomly selected** using a simple lottery technique, without considering the size

or status of the school, **33 teachers** became respondents in this study.

The use of random techniques aims to minimize selection bias and increase the **representativeness of the sample**, so that the results of the study can be better generalized to a wider population. The quantitative data obtained was processed using SPSS and the qualitative data obtained was processed using Nvivo.

The quantitative instrument used was a questionnaire in the form of a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree), consisting of 16 items related to teacher attitudes towards technology and the frequency of technology integration in learning. The qualitative instrument, a semi-structured interview guide, focused on teachers' experiences in using technology, the challenges faced, and the forms of support needed to improve technology integration. Quantitative data were analyzed using SPSS. Some of the statistical tests performed include: Validity test, Reliability test, Normality test, Linearity test, Heteroscedasticity test, Correlation test, Simple linear regression analysis, Hypothesis test (t-test), Coefficient of determination. Qualitative data were analyzed using Nvivo with thematic analysis techniques. This process involved coding the interview transcripts and identifying key themes, such as technology integration challenges, perceived benefits of technology, and training needs. This study adhered to the ethical principles of research. Prior to data collection, the researcher sought permission from the school principal. If the principal gave permission, it would be communicated to the participants to provide full information regarding the purpose and procedures of the study, as well as their right to refuse or stop participation at any time without consequences. All data collected was kept confidential and used for academic purposes only.

Results

1) Validity test

The validity test is used to test each of the variables used in this study. In this study there were 33 respondents, so a critical point was obtained with a real level of 5% ($r_{\frac{\alpha}{2};n-2} = r_{0.025;31}$) equal to 0.344. If the value of r count > r table, then the statement item can be declared valid.

No	r hitung	r tabel	Keterangan
1	0.672	0.344	Valid
2	0.749	0.344	Valid
3	0.769	0.344	Valid
4	0.754	0.344	Valid
5	0.799	0.344	Valid
6	0.682	0.344	Valid
7	0.661	0.344	Valid
8	0.683	0.344	Valid
9	0.800	0.344	Valid
10	0.809	0.344	Valid
11	0.651	0.344	Valid

Validity Test Results on Teacher Attitude Variables

It is known that the correlation of all statement items on the English teacher attitude variable has a value greater than r table. Therefore, it can be concluded that all statement items on this variable are valid.

No	r Count	r table	Description
1	0.793	0.344	Valid
2	0.706	0.344	Valid
3	0.674	0.344	Valid
4	0.823	0.344	Valid
5	0.741	0.344	Valid

Validity Test Results on Technology Integration Variables

It is known that the correlation owned by all statement items on the technology integration variable has a value greater than r table. Therefore, it can be concluded that all statement items on this variable are declared valid.

2) Reliability Test

Reliability test is used to measure the consistency of constructs or research variables. An instrument is said to be reliable if it has a *Cronbach's alpha* value greater than 0.6.

Variable	Cronbach's Alpha	Critical Point	Description
Teacher Attitudes	0.912	0.6	Reliabel
Technology Integration	0.794	0.6	Reliabel

Instrument Reliability Test Results on All Variables

It is known that the Cronbach's alpha value on the English teacher attitude and technology integration variables is 0.912 and 0.794, respectively. *Cronbach's alpha* obtained has a value greater than 0.6, so it can be concluded that the instruments of all research variables are reliable.
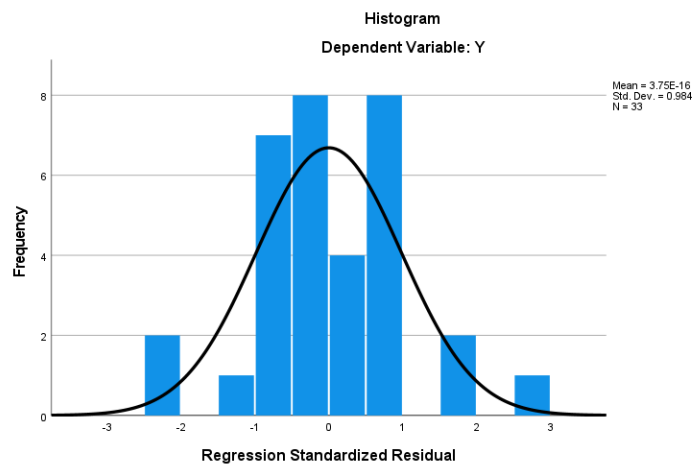
3) Normality Test

Linear regression assumes that each error is normally distributed. Normality test in this study using the *Kolmogorov-Smirnov* technique.

		Unstandardized Residual
N		33
Normal Parameters	Mean	0.000
	Std. Deviation	1.50225725
Most Extreme Differences	Absolute	0.128
	Positive	0.108
	Negative	-0.128
Test Statistic		0.128
Asymp. Sig. (2-tailed)		0.190

Normality Test Results on Unstandardized Residuals

It is known that Asymp. Sig. (2-tailed) in the *Kolmogorov-Smirnov* test of the unstandardized residual variable generated through the regression of the independent variable on the dependent variable produces a figure of 0.190. The significance obtained has a value greater than the α value (5%). Therefore, it can be concluded that the residual data is normally distributed.

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The results of the normality test can also be seen from the histogram above, where it can be seen that the histogram forms a bell. Thus, it can be concluded that the regression model residuals have met the normality assumption.

4) Linearity Test

The linearity test is used to determine whether the independent variable and the dependent variable have a linear relationship or not. Two variables are said to have a linear relationship if the significance of the deviation from linearity is more than 5%.

Variable	*Sig.*	Description
Teacher Attitudes	0.479	Linear

It is known that the significance value for the English teacher attitude variable is 0.479. The resulting significance of the variable has a value greater than 0.05. Therefore, the English teacher attitude variable has a linear relationship with the technology integration variable.

5) Heteroscedasticity Test

The heteroscedasticity test is used to check whether the error variance of the English teacher attitude variable is a constant number. *The Glejser test* is one way to determine whether there are symptoms of heteroscedasticity in the regression model. If the resulting significance value is greater than 5%, it can be stated that the regression model has fulfilled the assumption of homoscedasticity It is known that the significance value of the English teacher attitude variable is 0.576. The significance has a value greater than 0.05. Therefore, it can be concluded that there are no symptoms of heteroscedasticity in the regression model.

The results of the heteroscedasticity test can also be seen in the scatterplot above, where the distribution of the graph points is spread randomly and does not form a certain pattern. Thus, it can be concluded that the regression model has met the assumption of homoscedasticity.

6) Correlation Test

The correlation test is a test used to see the magnitude and direction of the relationship between two variables. The two variables are declared to have a significant relationship if the *p-value* obtained is less than 5%.

Variable		Teacher Attitude
Integration Technology	Person Correlation	0.781
	Sig. (2-tailed)	0.000

Correlation Test Results Between English Teacher Attitude Variables and Technology Integration

It shows that the *p-value* of the English teacher attitude variable and technology integration is 0.000. This value is smaller than the 5% significance level. Thus, it can be concluded that the two variables have a significant correlation or relationship. The Pearson correlation coefficient obtained from the English teacher attitude variable is 0.781, so it can be concluded that this variable has a strong unidirectional relationship with the technology integration variable.

7) Simple Linear Regression Analysis

Simple linear regression analysis aims to study the shape of the relationship between a dependent variable (technology integration) and one independent variable through a mathematical equation. That way, it can be known how much and the direction of the independent variable on the dependent variable.

Variable	Coefficient B
Constant	-1.112
Teacher Attitudes	0.455

Simple Regression Model Results

In the equation for the regression model in this study is obtained, namely:

$$\hat{Y} = -1.112 + 0.445X$$

a) The constant value obtained is -1.112. This constant shows the cut-off point of the regression line on the Y-axis, which describes the value of technology integration when the attitude of English teachers does not exist or is zero. In other words, if a teacher shows absolutely no attitude towards technology (teacher attitude score is zero), then the model predicts that the technology integration score will be at a negative value of -1.112. This could mean that without a positive attitude from the teacher, the application of technology in learning tends to be very low, maybe even nonexistent.

b) The coefficient value for the English teacher attitude variable is 0.445. This coefficient shows how much change occurs in the technology integration variable for every one unit increase in teacher attitude towards technology. Thus, if English teachers' attitude towards technology increases by one score, then technology integration in the learning process is also expected to increase by 0.445 units. This indicates a positive relationship between teachers' attitude towards technology and the level of technology integration in learning; the more positive the attitude, the higher the level of technology use in teaching.

8) Hypothesis Test (T-test)

The t test is used to determine whether all independent variables significantly affect the dependent variable. The null hypothesis will be rejected if the calculated

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t value obtained is greater than the t table or the *p-value* is smaller than 5%.

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	-1.112	2.501	-0.445	0.660
	Teacher Attitudes	0.445	0.065	6.955	0.000

It is known that the significant value for the effect of English teacher attitudes on technology integration is 0.000. The significance obtained has a value smaller than 5%,
so H0 is rejected and H1 is accepted. It can be concluded that the English teacher attitude variable has a significant effect on technology integration.

9) Coefficient of Determination

The coefficient of determination is used to determine how much variation in the dependent variable can be explained by the independent variable under study.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.781	0.609	0.597	1.526

It is known that the *R Square* value is 0.609. This means that 60.9% of the variation in technology integration variables can be explained by the English teacher attitude variable, while the remaining 39.1% is explained by other factors outside the research model.

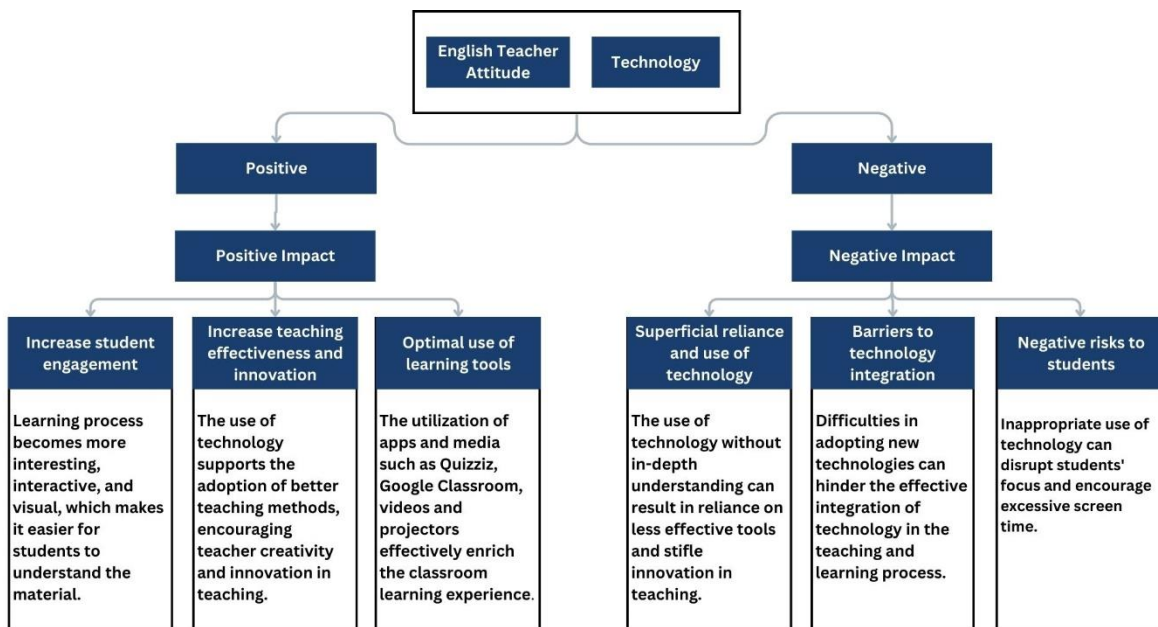## The Relationship Between Teachers' Attitudes toward Technology
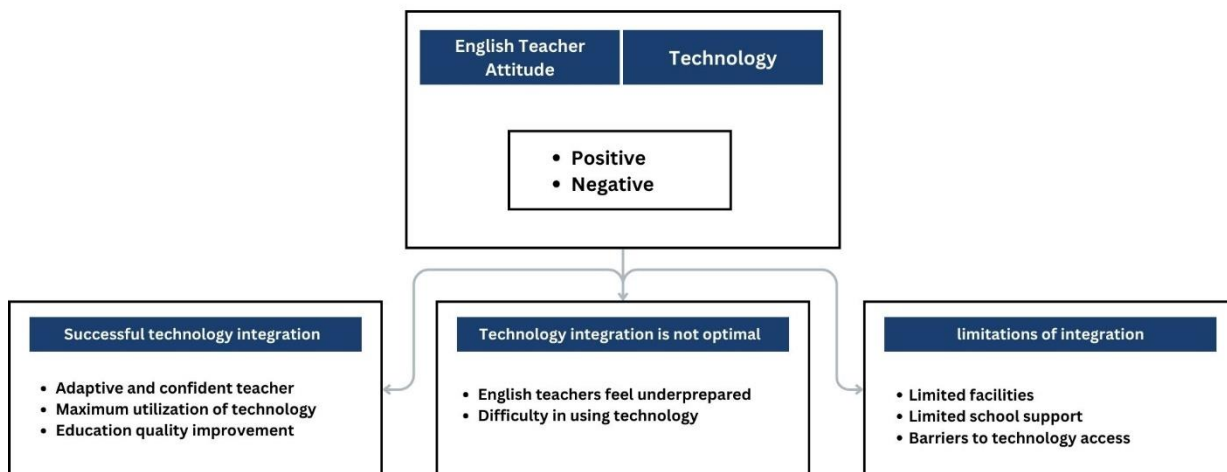
Teachers' attitude towards technology is a key factor in determining the success of technology integration in learning. One of the teachers said *"Teacher educators showed favorable views towards".*

Teachers who have a positive attitude, i.e. openness, flexibility and adaptability towards technology, tend to be more successful in integrating technology into teaching. They are able to make the most of digital tools, which contributes to improving the quality of education. As conveyed by one of the teachers *"There are many positives, many are positive as long as we can direct well and condition students in the use of technology. As long as students are directed, the children will really produce something positive. And when we give assignments, make projects, it turns out that the results of the students are above our expectations, because they seem to explore this technology very quickly".*

In contrast, teachers who feel underprepared or confused in using technology tend to have difficulties in integrating technology, which in turn can hinder learning effectiveness. In addition to attitudes, limited facilities and technology support in schools also affect teachers' ability to integrate technology. Although teachers have a positive attitude towards technology, limited facilities such as lack of access to technological devices and technical support from schools can be an obstacle in the optimal utilization of technology. As conveyed by one of the teachers *"I really want to use a projector, but because of the limited time it is like a hindrance because the projector is not available in every class. So, you have to be ready and of course it doesn't take long".* Thus, the combination of teachers' attitudes and technology support in schools largely determines how effectively technology can be integrated in the learning process attitudes and technology.

English Teachers Attitude towards Technology Integration in the Classroom

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The diagram begins by dividing teachers' attitudes towards technology into two main categories: positive attitudes and negative attitudes. These attitudes are the initial factors that influence how technology is used in learning. If teachers have a positive attitude towards technology, the impact will cover several aspects. As conveyed by one of the teachers *"For me, I am very open to technology, especially in teaching, because I teach at the high school level, they are also very aware and also recognize technology from birth. Well, as a teacher, we also have to keep adapting to the times and also adapt to how our students currently live with technology. So, I'm very open, especially in teaching, so that there is a correlation between our lives with technology and teaching. So that the advancement of learning will have a good impact".* Another teacher also said *"In my opinion, this technology has a positive effect. Because I am the one who receives the technology, so when I have decided to use the technology, it means I have to learn how to use it, to use the technology, it means I have to learn how to use it. I respond positively, so I am happy to use technology in the classroom".*

Technology can increase student engagement, making learning more interesting and interactive through visualizations that make it easier to understand the material. Positive attitudes also contribute to increased teaching effectiveness, with better adoption of technology, and increased creativity and innovation in teaching. The use of tools such as Quizizz, Google Classroom, as well as videos and projectors will be more optimized. Conversely, negative attitudes towards technology can result in superficial use of technology. This includes reliance on technology without deep understanding, less effective use of tools, and difficulty in adopting new technologies. Negative attitudes can also hinder technology integration, limit innovation in teaching, and bring negative risks such as distraction and excessive screen time. The diagram concludes that positive and proactive teacher attitudes greatly influence the success of technology integration in learning. This enables optimal utilization of technology and supports a better teaching and learning process. Conversely, negative or less open teacher attitudes can be a major hindrance, reducing the potential benefits of technology in education. This diagram structure helps demonstrate the relationship between teacher attitudes and their impact on technology use in the classroom.

Discussion
The Relationship of Teachers' Attitude towards Technology Integration

The results of this study indicate a significant positive relationship between teachers' attitudes towards technology and the level of technology integration in the classroom. Teachers who have positive attitudes are more likely to use digital tools effectively, such as projectors, Google Classroom, and interactive platforms like Kahoot or Quizizz to increase student engagement. This finding is in line with previous research which emphasizes that openness, flexibility and willingness to

adapt to new technology tools are key factors in successful technology integration. In contrast, teachers who have negative or skeptical attitudes are less likely to utilize available technology, limiting the potential for innovation and learning dynamics.

Challenges in Technology Integration: Infrastructure and Support

While teachers' positive attitudes play an important role, this study also highlights the importance of adequate infrastructure and technical support. In many cases, even teachers who show positive attitudes towards technology face challenges due to limited access to devices, unstable internet connections, or lack of technical support from the school. These barriers hinder the full integration of technology as teachers are unable to utilize the tools effectively. Therefore, investment in infrastructure and ongoing technical assistance is essential to maximize the benefits of technology integration in the classroom.

Conclusion

The purpose of this study is to investigate the relationship between teachers' attitudes towards technology affect their willingness to integrate technology in learning activities. This study shows that there is a positive and significant relationship between teachers' attitudes towards technology and the level of technology integration in learning. This confirms the hypothesis that teachers with positive attitudes - especially openness and flexibility - are more effective in using technology such as Google Classroom, Kahoot, and Quizizz to increase student engagement. In contrast, teachers with negative attitudes tend to underutilize technology optimally, hindering innovation in learning. These teachers' opinions are influenced by a variety of factors, such as their own technological experience, the assistance and training they have received, and how they see the value of technology in the classroom.

The significance of professional development and training for educators in enhancing their proficiency and self-assurance in utilizing technology is underscored by this study. Positive attitudes can be changed by excellent training, which can also promote the wider and more efficient use of technology in the classroom. This study also highlights the fact that instructors' preparation and willingness to embrace technology have a significant role in the success of technology integration, in addition to the accessibility of technological tools. As a result, education policy should prioritize not just delivering technology but also helping teachers adopt a favourable view of it by providing ongoing support and relevant training. Overall, the results of this study support the notion that a teacher's attitude plays a crucial role in how well technology is integrated into the classroom. It is possible to enhance technology integration in the classroom and so contribute to the overall enhancement of educational quality by comprehending and resolving the obstacles, which include those related to attitudes and

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competencies.

This study has several limitations. Firstly, the relatively small sample size (33 teachers) may affect the generalizability of the results. In addition, the study only focused on English teachers in four districts, so the findings may not be fully representative of the educational context in other regions. Future research could expand the area coverage to gain more comprehensive insights.

Based on these findings, several practical recommendations can be proposed:

1. Targeted Training: Schools and education offices need to organize trainings that focus on specific skills in using digital tools, such as LMSs and interactive quiz apps, to increase teachers' confidence in integrating technology.
2. Improved Technology Infrastructure: Providing adequate devices and stable internet connections should be a priority to support effective technology integration.
3. Continuous Support: In addition to training, schools should provide ongoing technical support to help teachers deal with technical challenges when using technology in teaching.

Acknowledgement

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