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The Influence of Teachers' Digital Literacy and the Use of Technology Media on Students' Ability to Identify Hoaxes in the Digital Era

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ABSTRACT

Purpose of the study: This study aims to examine the influence of teacher digital literacy and the use of media technology on students' ability to identify hoaxes in the digital era.

Methodology: A mixed-method approach was employed, combining quantitative analysis using Multiple Linear Regression with Statistical Package for the Social Sciences (SPSS) and qualitative analysis with the Miles and Huberman model through interviews with teachers. The research sample consisted of 50 teachers and 200 students from secondary schools in both urban and rural areas, selected through purposive sampling. The research instrument used a questionnaire and interview guide.

Main Findings: The results indicated that both teacher digital literacy and the use of media technology positively influenced students' ability to identify hoaxes. Teachers with higher digital literacy levels were able to effectively use media technology to guide students in critical thinking and information verification. The use of media technology helped students compare information from different sources and better assess its validity.

Novelty/Originality of this study: This study contributes to the field by exploring the combined impact of teacher digital literacy and media technology usage on students' ability to recognize and evaluate misinformation, addressing a critical issue in the context of education in the digital age.

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1. INTRODUCTION

In the digital era, access to information has become easier and faster thanks to the development of information and communication technology [1]-[3]. However, this convenience also brings challenges, one of which is the rampant spread of hoaxes or false information. Hoaxes can have a negative impact on various aspects of life, including education, politics, and social [4]-[6]. Therefore, the ability to identify hoaxes is an important skill that every individual must have in the digital era. In the context of education, teachers play an important role in guiding students in understanding and filtering correct information [7]-[9].

Teachers' digital literacy is one of the key factors in improving students' ability to recognize hoaxes. Digital literacy includes understanding and skills in using digital technology effectively and responsibly [10]-[12]. Teachers who have good digital literacy can integrate technology-based learning to train students to identify false information [13]-[15]. With qualified digital literacy, teachers can provide learning strategies and methods that are relevant to students' needs in the digital era [16]-[18]. This makes teachers' digital literacy an important element in supporting an adaptive and responsive education process to the challenges of the times.

In addition to teacher digital literacy, the use of technology media in learning also plays a significant role. Technology media such as the internet, learning applications, and social media can be utilized to provide interactive and contextual learning experiences [19]-[21]. Through technology media, students can be trained to search for, evaluate, and analyze information from various sources [22]-[24]. The use of appropriate technology media can help students develop the information literacy skills needed to recognize hoaxes [25]-[27]. Thus, technology media is not only a learning tool, but also a means to build students' critical abilities in facing the digital era.

Students' ability to identify hoaxes is part of information literacy which includes critical thinking skills. This information literacy is important to ensure that students are not only able to access information, but also understand and evaluate its truth [28]-[30]. In the midst of the unstoppable flow of information, students need to be trained to think critically about every piece of information received. With the guidance of technology-literate teachers, students can learn to recognize the signs of false information and avoid spreading it [31],[32]. This ability is one of the important provisions for students to become digitally intelligent individuals.

However, not all teachers have adequate digital literacy to support technology-based learning. Factors such as lack of training, minimal facilities, and resistance to change are obstacles in the implementation of digital literacy among teachers [33]-[35]. Teachers' unpreparedness in utilizing technology can affect the effectiveness of learning and the development of students' digital literacy [36]-[38]. Therefore, efforts are needed to improve teachers' digital literacy through ongoing training and mentoring [39]. This is important so that teachers can adapt to the demands of learning in the digital era.

The use of technology media in learning also faces various challenges, including accessibility and technological literacy among students [40]-[42]. Not all students have adequate access to technological devices and stable internet connections [43]-[45]. This can create a gap in digital literacy skills between students who have access to technology and those who do not. In addition, the use of technology without proper guidance can lead to misuse of information or dependence on technology [46],[47]. Therefore, a student-centered and technology-based learning approach must be designed with inclusivity and long-term impacts in mind [48].

Previous research conducted by Afrilyasanti et al., [49] highlighted the importance of critical media literacy in the context of English as a foreign language (EFL) learning, focusing on teachers' perspectives on teaching the ability to distinguish between facts and fake news. Previous research conducted by Gouseti et al., [50] focused on teachers' perceptions of critical digital literacy and how it is implemented in their teaching practices. These studies tend to highlight teachers' conceptual understanding and pedagogical application of digital literacy in supporting student learning. Previous research, conducted by Boonmoh et al., [51] emphasized conceptual exploration and compilation of findings from various studies to understand general patterns of technology use in education. These studies tend to focus on pedagogical approaches and the role of teachers in helping students develop critical analysis skills of texts in language learning. In contrast, the current study broadens the scope by directly linking teachers' digital literacy and the use of technological media to students' ability to identify hoaxes. Thus, this study not only highlights the role of teachers in the learning context but also integrates the dimensions of technology and digitalization as key factors. The gap that emerges lies in the shift in focus from pedagogical analysis based on media literacy in the classroom to empirical studies on the influence of teachers' digital competence and technology on students' abilities in the digital era, thus providing a broader and contextual perspective in an increasingly complex information era.

This study offers novelty by integrating two main variables, namely teachers' digital literacy and the use of technological media, to examine their influence on students' ability to identify hoaxes in the digital era. Unlike previous studies that focused more on media literacy in general or in the context of language learning, this study specifically explores how teachers' digital competence and use of technology contribute to overcoming the increasingly widespread challenges of misinformation and disinformation. This study also provides an empirical approach to the role of teachers in equipping students with information literacy skills that are relevant to the digital era, where the rapid and massive flow of information requires a new approach in education.

The urgency of this research is driven by the increasing spread of hoaxes in the digital era, which can affect the way students understand and use information. In a world dominated by digital media, students need higher information literacy skills to distinguish valid information from misinformation. As educators, teachers have an important responsibility in guiding students to become critical consumers of information. However, without adequate digital literacy, teachers may not be able to utilize technology media effectively to achieve this goal. Therefore, this research is urgently needed to identify key factors that can improve students' ability to identify hoaxes, while also informing educational policies related to digital literacy in schools.

This study aims to analyze the influence of teachers' digital literacy and the use of technological media on students' abilities in identifying hoaxes in the digital era. By understanding the relationship between teachers' digital literacy, the use of technological media, and students' abilities, it is hoped that this study can provide practical recommendations to improve the quality of education in the digital era. The results of this study are also expected to contribute to building a generation that is digitally intelligent, critical, and responsible. In addition, this study seeks to encourage the optimal use of technology in education to face the challenges of information in the digital era. Thus, this study is relevant in supporting the vision of education that is adaptive to the development of technology and information.

2. RESEARCH METHOD

2.1. Types of Research

This study uses a mixed-method approach to comprehensively analyze the quantitative and qualitative aspects of the research problem [52],[53]. This approach was chosen because it is able to provide a holistic understanding of the influence of teachers' digital literacy and the use of technological media on students' ability to identify hoaxes. Quantitative data provides evidence in the form of numbers regarding the relationship between variables [54], while qualitative data provides in-depth insights into contextual factors and subjective experiences [55]. This combination of methods ensures that research findings are stronger and minimizes bias that might arise if only one type of data is used.

Additionally, the mixed-method approach allows for triangulation, which can increase the validity and reliability of the study. By integrating data from surveys and interviews, the study was able to capture multiple perspectives and identify patterns that may not be apparent with a single method alone. This approach is particularly relevant to educational research, given the complexity of human-technology interactions. Overall, the mixed-method design fits the study’s goal of generating evidence-based recommendations that can be applied to educational practice.

2.2. Research Sample

Participants in this study involved 50 teachers and 200 students from secondary schools in urban and rural areas selected through purposive sampling techniques. This technique was used to ensure that participants represented a variety of backgrounds, experiences, and contexts relevant to exploring the research problem comprehensively. Teachers were included because of their important role in integrating technology media into the classroom, while students were the main focus as the beneficiaries of such efforts. The selection of schools from various regions ensured that this study covered variations in access to technology and levels of digital literacy.

Purposive sampling allowed for the selection of participants based on certain criteria, such as teachers’ level of familiarity with digital technology and students’ exposure to technology media in learning [56],[57]. This approach ensured that the sample was relevant to the research objectives and provided meaningful insights. In addition, the involvement of participants from different geographic and socio-economic contexts helped identify gaps in digital literacy and technology access, providing a deeper understanding of the challenges and opportunities in the educational context.

2.3. Research Instruments and Data Collection Techniques

This study used two main instruments, namely a survey and an interview guide. The survey was a structured questionnaire designed to measure teachers' digital literacy, teachers' use of technology media, and students' ability to identify hoaxes. Each questionnaire used a 5-point Likert scale. This instrument provides quantitative data on key variables, allowing statistical analysis of relationships and trends. Survey items were developed based on a proven framework and adapted to the context of this study.

In addition to the survey, an interview guide was used to explore teachers' strategies in integrating technology media and their perceptions of its impact on students. This qualitative instrument included open-ended questions to encourage in-depth answers and reveal more detailed insights [58]. These instruments complement each other to ensure that the data collected covers various aspects of the research problem. Reliability testing using Cronbach's Alpha was conducted to ensure the internal consistency of the questionnaire instrument used, especially in measuring teachers' digital literacy, teachers' use of technology media, and students' ability to identify hoaxes. The Cronbach's Alpha value of 0.70 indicates that the research instrument has good reliability. The outline of the research instrument used is as follows.

Table 1. Digital Literacy Questionnaire Instrument Grid for Teachers

No	Indicators	Number of Statement Items
1	Ability to Operate Technology	4
2	Ability to Search and Assess Information	4
3	Understanding of Digital Security	4
4	Ability to Think Critically in Digital	4
5	Use of Technology for Collaboration	4

Table 2. Grid of Teacher Technology Media Use Questionnaire Instrument

No	Indicators	Number of Statement Items
1	Utilization of Technology in Learning	4
2	Utilization of Digital Resources	4
3	Use of Social Media	4
4	Interactivity with Technology	4
5	Students' Digital Skills	4

Table 3. Grid of Questionnaire Instrument for Students' Ability to Identify Hoaxes

No	Indicators	Number of Statement Items
1	Ability to Recognize Information Sources	4
2	Ability to Evaluate Truth	4
3	Ability to Identify Signs of Hoaxes	4
4	Ability to Utilize Technology to Verify Information	4
5	Critical of News on Social Media	4

Table 4. Interview Guide Instrument

No	Questions
1	How do you define digital literacy, and to what extent do you feel you have mastered it?
2	What are your main strategies in using technology media to help students identify hoaxes?
3	What are the main challenges you face in integrating technology media into learning?
4	How does technology media affect students' ability to think critically and filter information?
5	How do you evaluate the success of using technology media in learning?

2.4. Data Analysis Techniques

Quantitative data in this study were analyzed using SPSS (Statistical Package for the Social Sciences) to identify the relationship between the variables studied [59],[60]. This analysis was carried out using the Multiple Linear Regression technique to determine the effect of teacher digital literacy and the use of technology media on students' ability to recognize hoaxes. This regression technique was chosen because it can handle more than one independent variable and allows hypothesis testing to see the direct and indirect effects of these variables [61]. The results of the multiple linear regression analysis will provide an overview of the strength and direction of the relationship between the variables tested, as well as the significance value (p-value) to assess the meaningfulness of the relationship. Before the multiple linear regression test is carried out, an assumption test will be carried out first, namely the normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test. After the data meets all the assumption tests, the hypothesis test is carried out using the multiple linear regression test.

For qualitative data, this study used the Miles and Huberman model, which involves three main steps: data reduction, data presentation, and drawing conclusions/verification [62]. The data reduction process is carried out by organizing and simplifying qualitative data to focus on information that is relevant and directly related to the research objectives. Data presentation is done by arranging qualitative findings in a visual format in the form of tables to facilitate interpretation and understanding. Finally, conclusions are drawn by synthesizing patterns and themes that emerge from the data, ensuring that the conclusions are based on valid and relevant evidence..

2.5. Research Procedures

The research began with the development and validation of the instrument to ensure its reliability and suitability to the research context. After the instrument was validated, data collection was carried out by distributing surveys to teachers and students, and conducting interviews with some teachers to gain qualitative insights. The data collection stage was continued with in-depth analysis. Quantitative data from the survey were analyzed using SPSS to test the influence between variables. Meanwhile, qualitative data from the interviews were analyzed using the Miles and Huberman approach, with the results synthesized to identify key insights. The findings from both analyses were then integrated to provide a comprehensive understanding of the research

problem. Finally, the research results were used to develop practical recommendations to improve digital literacy and the use of media technology in education.

3. RESULTS AND DISCUSSION

After the research data is obtained, the quantitative data will be described in the form of descriptive statistics and inferential statistics in the form of hypothesis testing, namely multiple linear regression. While qualitative data will be presented in the form of tables and then described. The results of this study are as follows.

Table 5. Descriptive Statistics of teachers' digital literacy, teachers' use of technology media, and students' ability to identify hoaxes

Variables	Category	Interval	Frequency	Percentage (%)	
Teacher digital literacy	Very good	85 – 100	17	34.0	Mean = 84.0 Median = 80.0 Minimum = 56.0 Maximum = 98.0
	Good	69 – 84	26	52.0	
	Fair	53 – 68	7	14.0	
	Not good	37 – 52	0	0.0	
	Very bad	20 – 36	0	0.0	
Teacher's use of technology media	Very good	85 – 100	14	28.0	Mean = 82.0 Median = 84.0 Minimum = 54.0 Maximum = 94.0
	Good	69 – 84	24	48.0	
	Fair	53 – 68	11	22.0	
	Not good	37 – 52	0	0.0	
	Very bad	20 – 36	0	0.0	
Students' ability to identify hoaxes	Very good	85 – 100	22	11.0	Mean = 80.0 Median = 78.0 Minimum = 32.0 Maximum = 96.0
	Good	69 – 84	98	49.0	
	Fair	53 – 68	60	30.0	
	Not good	37 – 52	11	5.5	
	Very bad	20 – 36	9	4.5	

Based on table 5, the descriptive results show that the majority of teachers have a digital literacy level that is in the Good category (52%, 26 people) and Very Good (34%, 17 people). A small number of teachers are in the Sufficient category (14%, 7 people), while no teachers are in the Not Good or Very Poor category. The average (mean) digital literacy score of teachers is 84.0, indicating that most teachers are on the threshold of the Good to Very Good category. The median score is 80.0, with a minimum score of 56.0 (Sufficient category) and a maximum score of 98.0 (Very Good category). This indicates that in general, teachers have adequate competence in digital literacy to support the learning process.

The results show that the majority of teachers have digital literacy in the Good to Very Good category, with an average score of 84.0. This indicates that teachers have sufficient ability to use technology in the learning process. High digital literacy allows teachers not only to access information, but also to manage, evaluate, and convey that information effectively. This finding is in line with the research of Su [63], which emphasizes the importance of teacher digital literacy to support technology-based pedagogical innovation.

Although the results show a fairly good level of literacy, there are 14% of teachers who are still in the Sufficient category, which can affect the quality of technology implementation in learning. This limitation can be caused by factors such as lack of training, uneven access to technology, or minimal motivation to improve competence. Therefore, intensive practice-based training programs, such as digital classroom management training or the use of interactive media, need to be improved to ensure that all teachers achieve optimal literacy levels.

Most teachers use technology media at the Good level (48%, 24 people), followed by the Very Good category (28%, 14 people). As many as 22% (11 people) are in the Sufficient category, while no teachers are in the Not Good or Very Poor categories. The average use of technology media by teachers is 82.0, with a median value of 84.0, indicating that most teachers are approaching the Very Good category in utilizing technology media. The minimum value recorded is 54.0 (Sufficient category) and the maximum value is 94.0 (Very Good category). These results indicate a gap in the ability to utilize technology, but overall the use of technology is quite effective.

As many as 48% of teachers are in the Good category, and 28% are in the Very Good category in using technology media, with an average of 82.0. This finding shows that most teachers have integrated technology media in learning. Technology media allows for more interactive and contextual learning, which is important in supporting students' understanding of issues such as hoaxes. Abubakir & Alshaboul [64] research on Technological Pedagogical Content Knowledge (TPACK) supports that teachers' mastery of technology contributes to the effectiveness of learning, especially in the context of technology-based learning.

However, 22% of teachers are still in the Sufficient category, which shows that there are teachers who have not utilized technology media optimally. Factors such as limited infrastructure, lack of time to design media, and resistance to change are challenges that need to be overcome. Recommendations that can be given are

increasing technical support in schools, procuring adequate devices, and time allocated specifically for teachers to study technology media that is relevant to students' needs.

The students' ability to identify hoaxes is dominated by the Good category (49%, 98 students), followed by the Sufficient category (30%, 60 students). As many as 11% (22 students) are in the Very Good category, while the rest are in the Not Good (5.5%, 11 students) and Very Not Good (4.5%, 9 students) categories. The average value of students' ability is 80.0, with a median value of 78.0, indicating that most students have fairly good abilities, but there is still room for improvement towards the Very Good category. The minimum value is 32.0 (Very Not Good category), and the maximum value is 96.0 (Very Good category). This shows that although the majority of students are able to identify hoaxes, there are a small number of students who still need further coaching.

Students' ability to identify hoaxes shows that the majority of students are in the Good category (49%) with an average of 80.0. This indicates that digital literacy and technology-based learning strategies have had a positive impact on students' ability to think critically and filter information. Hasanah [65] research shows that digital literacy-based learning can improve students' ability to evaluate information, especially in an information era full of hoaxes and misinformation.

However, as many as 40 students (20%) are in the Not Good and Very Not Good categories, indicating a skill gap among students. Factors such as limited access to technology at home, low motivation to learn, or lack of teacher guidance can be the cause. To overcome this, simulation-based learning strategies, such as analyzing hoax case studies, or collaborating with anti-hoax organizations can be applied. This will increase student engagement and provide relevant practical experience.

This study was conducted to test the effect of teachers' digital literacy and the use of technology media on students' ability to identify hoaxes in the digital era, therefore the researcher used multiple linear regression tests. Before the hypothesis test is carried out, the data must meet the assumption requirements for multiple linear regression tests, namely no multicollinearity, no heteroscedasticity, no autocorrelation, and the data comes from a normally distributed population. The results of the data normality test are shown in table 6.

Table 6. Results of Data Normality Test

Variables	Uji Kolmogorov-Smirnov (Sig.)	Conclusion
Teacher Digital Literacy	0.200	Normal
Teacher Technology Media Use	0.190	Normal
Students' Ability to Identify Hoaxes	0.150	Normal

The normality test was performed using Kolmogorov-Smirnov (K-S) with a significance of $p > 0.05$ indicating that the data was normally distributed. Based on the results in table 6, the research data was normally distributed. Next is the multicollinearity test, the results of the multicollinearity test are listed in table 7.

Table 7. Multicollinearity Test Results

Independent Variable	Tolerance	VIF	Conclusion
Teacher Digital Literacy	0.658	1.519	No multicollinearity occurs
Teacher's Use of Technology Media	0.720	1.389	No multicollinearity occurs

Multicollinearity test uses Tolerance value > 0.10 and Variance Inflation Factor (VIF) < 10 to indicate the absence of multicollinearity. Based on the results in table 7, the independent variable data in this study does not experience multicollinearity. Next is the heteroscedasticity test, the results of the heteroscedasticity test are listed in table 8.

Table 8. Heteroscedasticity Test Results

Independent Variable	Sig. (p-value)	Conclusion
Teacher Digital Literacy	0.225	No heteroscedasticity occurs
Teacher's Use of Technology Media	0.310	No heteroscedasticity occurs

The heteroscedasticity test was conducted using the Glejser Test. If the significance value $p > 0.05$, then there is no heteroscedasticity. Based on the results in table 8, the independent variable data in this study did not experience heteroscedasticity. Next is the autocorrelation test, the results of the autocorrelation test are listed in table 9.

Table 9. Autocorrelation Test Results

Model	Durbin-Watson (D-W)	Conclusion
Teacher Digital Literacy	1.890	No autocorrelation occurs
Teacher Technology Media Usage	2.030	No autocorrelation occurs

Autocorrelation test using Durbin-Watson (D-W). D-W values in the range of 1.5–2.5 indicate that there is no autocorrelation. Based on the results in table 9, the data does not have autocorrelation. The assumption test for the multiple linear regression test has been met, namely there is no multicollinearity, no heteroscedasticity, no autocorrelation, and the data comes from a normally distributed population. After the assumption test has been met, the hypothesis test can be carried out. The hypothesis test in this study uses a multiple linear regression test with the help of SPSS. The following are the results of the multiple linear regression test that describe the influence of teacher digital literacy (X1) and the use of technology media by teachers (X2) on students' ability to identify hoaxes (Y).

Table 10. Multiple Linear Regression Test Results

Independent variable	B (Regression Coefficient)	t	Sig. (p-value)	Conclusion
Teacher Digital Literacy (X1)	0.485	4.321	0.000	Significantly affects Y
Teacher Use of Technology Media (X2)	0.358	3.562	0.001	Significantly affects Y
Dependent variable: students' ability to identify hoaxes (Y).				

Model Statistics: R = 0.732
R^2 = 0.536
Adjusted R^2 = 0.527
F = 58.234
Sig. F (p-value) = 0.000

Based on the results of the multiple linear regression test above, the results can be interpreted. Teacher Digital Literacy (X1) has a coefficient B = 0.485, meaning that every one unit increase in teacher digital literacy will increase students' ability to identify hoaxes by 0.485 units, assuming other variables remain constant. Teacher Technology Media Use (X2) has a coefficient B = 0.358, indicating that every one unit increase in the use of technology media will increase students' abilities by 0.358 units. The p value <0.05 for both independent variables indicates that teacher digital literacy and the use of technology media significantly affect students' ability to identify hoaxes. The R^2 value = 0.536 indicates that 53.6% of the variability in students' ability to identify hoaxes can be explained by teacher digital literacy and the use of technology media. The remaining 46.4% is explained by other variables not included in the model. The F value = 58.234 with p = 0.000 indicates that the overall regression model is significant.

The results of this multiple linear regression test provide in-depth insight into the influence of teacher digital literacy and the use of technology media on students' ability to identify hoaxes. The B coefficient for teacher digital literacy (X1) of 0.485 indicates that every one-unit increase in teacher digital literacy will increase students' ability to identify hoaxes by 0.485 units, assuming other variables remain constant. This shows that increasing teachers' ability to use information technology is closely related to students' ability to think critically and verify the information they receive. This is also supported by the findings of interviews with teachers who revealed that they felt they had mastered digital literacy well enough to provide more effective guidance to students in dealing with information circulating in cyberspace.

In addition, the B coefficient for teacher technology media use (X2) of 0.358 indicates that every one unit increase in teacher technology media use will increase students' ability to identify hoaxes by 0.358 units. Although smaller than teacher digital literacy, this figure still shows the importance of using appropriate technology in learning to train students to filter and verify information. Teachers who are more skilled in using technology media can help students understand how to check the credibility of information sources and evaluate their truth, thereby improving students' information literacy.

The R^2 value = 0.536 indicates that around 53.6% of the variability in students' ability to identify hoaxes can be explained by these two factors. This means that although teachers' digital literacy and the use of technological media have a significant influence, there are still around 46.4% of other factors that also influence students' ability to identify hoaxes, such as family environment factors, educational policies, or technological support at school. The F value = 58.234 with p = 0.000 confirms that the overall regression model is significant, indicating that these two independent variables have a strong influence on students' abilities. Based on these results, it is very important to prioritize the development of teachers' digital literacy in educational policies, so that students

are better prepared to face the challenges of information in the digital era and prepare them to become smart and critical consumers of information.

Furthermore, the interview results as qualitative data in this study can be seen in table 11 which is listed as follows.

Table 11. Results of Interviews with Teachers

No	Topics	Interview Results
1	Definition and Mastery of Digital Literacy	Digital literacy is defined as the ability to use information technology effectively and responsibly, including identifying valid information. Teachers feel they have mastered digital literacy, especially in using devices and applications that support learning.
2	Strategies for Using Technology Media in Identifying Hoaxes	The strategies used by teachers can include providing examples of hoaxes that are relevant to students' lives, then teaching steps to verify information, such as checking sources and cross-searching on the internet.
3	Challenges in Integrating Technology Media into Learning	The challenges in integrating technology media are limited access to technology in some areas, lack of special training for teachers, and limited time to explore all available technology features.
4	The role of technology media in critical thinking skills and filtering information	Technology media greatly helps students to think critically, especially in comparing information from various sources. However, the challenge is that students often get caught up in too much information, making it difficult to decide which is true.
5	How to evaluate the success of using technology media in learning	Teachers can evaluate the success of using technology media in learning through the results of technology-based student assignments, class discussions, and student responses in analyzing information. If students can explain the steps to verify information correctly, then the students' use of technology can be considered successful.

Based on the results of interviews conducted with teachers, teachers define digital literacy as the ability to use information technology effectively and responsibly, including the ability to identify valid information. Most teachers feel that they have mastered digital literacy, especially in the use of learning support devices and applications. This finding shows that the mastery of digital literacy among teachers is already at a good level. However, this mastery still needs to be improved, especially in critical skills such as analyzing information sources and educating students to be more aware of the threat of hoaxes. This is in line with research by Khan et al., [66], which emphasizes the importance of digital literacy as one of the main skills in the digital era to improve critical thinking skills.

Teachers use various strategies to help students identify hoaxes, such as providing examples of hoaxes that are relevant to students' lives and teaching steps to verify information. This strategy reflects the teacher's efforts to integrate contextual-based learning, which is very important for the relevance of the material. In addition, this approach is in line with the digital literacy-based learning model, where students are taught not only to understand information but also to evaluate its credibility. These results support the findings of Mayisela [67], which highlights the importance of practice-based learning in developing students' digital literacy skills.

Some of the main challenges faced by teachers include limited access to technology in certain areas, lack of specific training for teachers, and limited time to learn technology features. These challenges indicate a technological gap between more developed and less developed areas, which has the potential to hinder the implementation of technology media evenly. In addition, the need for further training is also an indication of the need for support from the government or related institutions in improving teacher capacity. Purnomo et al., [68] stated that access to technology and training for educators are two key elements in accelerating the transformation of digital-based education.

Technology media has been proven to help students develop critical thinking skills, especially in comparing information from various sources. However, there is an obstacle in the form of information overload, which makes it difficult for students to determine which information is valid. This condition underlines the importance of teacher assistance in guiding students to be more selective in absorbing information. This is in line with research by Cho et al., [69] which emphasizes that digital media literacy must include the ability to manage information in an era where data volume continues to increase.

Teachers evaluate the success of using technology media through the results of technology-based student assignments, class discussions, and student responses in analyzing information. Indicators of this success include students' ability to explain the steps of verifying information. This approach is relevant to the performance-based evaluation model, where student success is measured based on their application skills. This finding supports the concept of outcome-based learning as explained by Syaharuddin et al., [70] which emphasizes the importance of assessing learning based on the competencies achieved by students.

The results of the study indicate that teachers' digital literacy has a significant contribution to students' ability to identify hoaxes. Quantitatively, the average score of teachers' digital literacy is in the good category (Mean = 84.0), with the majority of teachers showing high competence in using information technology to support learning. This data is supported by qualitative findings showing that teachers have understood the importance of digital literacy, especially in utilizing devices and applications to evaluate information. However, challenges such as lack of special training and limited time to explore technology are still obstacles that need to be overcome. This finding is in line with Gustian et al., [71], which emphasizes that educators' digital literacy is an important foundation in shaping students' critical thinking skills.

The use of technology media by teachers also showed a positive influence on learning, with an average score in the good category (Mean = 82.0). Teachers used various strategies, such as providing examples of hoax cases and teaching steps to verify information. From a qualitative perspective, technology media is considered very helpful for students to think critically and filter information, although some students face challenges in managing too much information. This supports the quantitative results that the use of technology media is closely related to students' ability to recognize valid information (Mean = 80.0). This finding is consistent with Wahjusaputri & Nastiti [72], which states that technology media that is optimally utilized can improve students' digital literacy competencies and analytical skills.

The integration of quantitative and qualitative results provides an illustration that teachers' digital literacy and the use of technological media play complementary roles in improving students' ability to recognize hoaxes. Strong teacher digital literacy ensures that technological media are used effectively in learning. However, strategic policies are needed to support continuous digital literacy training, equal access to technology, and the provision of adequate devices in schools. By addressing these barriers, students' ability to think critically and filter information can be improved, enabling them to become individuals who are better prepared to face challenges in the digital era.

The implications of this study, both in local and global contexts, are very significant in facing the increasingly complex challenges of the digital era. Locally, the results of this study emphasize the importance of improving teachers' digital literacy and utilizing technology media as an integral part of learning in schools. This is a strategic step to strengthen students' ability to identify hoaxes, which are increasingly prevalent in Indonesian society, especially in the era of rapidly developing social media. Globally, this study supports UNESCO's digital literacy agenda which highlights the importance of developing critical and analytical skills for students around the world to combat disinformation and misinformation. By integrating digital literacy into education, both at the local and global levels, teachers can become agents of change in preparing young people to face global challenges, such as hoaxes related to politics, health, and the environment, with an approach based on facts and critical thinking.

This study has several limitations that need to be considered. The quantitative and qualitative approaches used have limitations in uncovering other factors, such as school culture, institutional support, or family roles, which may also influence students' ability to identify hoaxes. This study focuses on digital literacy and the use of technology media in general, without exploring in depth the types of media or specific platforms used. For future research, it is recommended to explore more deeply the influence of specific technology platforms, as well as consider other variables, such as family attitudes towards digital literacy and the role of education policies in supporting the integration of technology in learning.

4. CONCLUSION

This study concludes that teachers' digital literacy and the use of technology media play a significant role in improving students' ability to identify hoaxes in the digital era. Teachers with a high level of digital literacy are able to utilize technology media effectively to guide students to think critically and filter information. These results emphasize the importance of strengthening teachers' digital competence and integrating technology into learning as an effort to equip students to face the increasingly complex challenges of disinformation. Based on these findings, it is recommended that digital literacy training programs for teachers be improved and adjusted to the needs of current technology. In addition, there needs to be a policy that ensures equal access to technology across all regions, as well as the development of a curriculum that is more focused on information and digital literacy education, so that students can become critical, intelligent, and responsible individuals in utilizing information in the digital era.

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REFERENCES

[1] A. Haleem, M. Javaid, M. A. Qadri, and R. Suman, "Understanding the role of digital technologies in education: A review," *Sustain. Oper. Comput.*, vol. 3, no. February, pp. 275–285, 2022, doi: 10.1016/j.susoc.2022.05.004.

[2] I. Chatterjee and P. Chakraborty, "Use of Information Communication Technology by Medical Educators Amid COVID-19 Pandemic and Beyond," *J. Educ. Technol. Syst.*, vol. 49, no. 3, pp. 310–324, 2021, doi: 10.1177/0047239520966996.

[3] O. K. T. Kilag *et al.*, "ICT Integration in Primary School Classrooms in the time of Pandemic in the Light of Jean Piaget's Cognitive Development Theory," *Int. J. Emerg. Issues Early Child. Educ.*, vol. 4, no. 2, pp. 42–54, 2022, doi: 10.31098/ijeiece.v4i2.1170.

[4] I. F. Agustina, Z. Z. Ali, Sakirman, H. Octavianne, and M. Jamal, "Political Hoaxes in the Post-Truth Era: An Islamic Political Analysis," *Al-Istinbath J. Huk. Islam*, vol. 8, no. 2, pp. 645–666, 2023, doi: 10.29240/jhi.v8i2.8457.

[5] D. S. M and Hairunnisa, "The Phenomenon of Fake News (Hoax) in Mass Communication: Causes, Impacts, and Solutions," *Open Access Indones. J. Soc. Sci.*, vol. 6, no. 3, pp. 980–988, 2023, doi: 10.37275/oaijss.v6i3.161.

[6] F. M. Kasim, M. Ali, M. Mursalin, and M. Y. Harun, "The Impact of Mediating Fake News on Government Policies in Creating Socio-Political Stability and the Urgency of Literacy Education," in *Proceedings of the International Conference on Social Science, Political Science, and Humanities (ICoSPOLHUM 2020)*, 2021, pp. 215–221. doi: 10.2991/assehr.k.210125.036.

[7] A. M. Bettayeb, M. Abu Talib, A. Z. Sobhe Altayasinah, and F. Dakalbab, "Exploring the impact of ChatGPT: conversational AI in education," *Front. Educ.*, vol. 9, no. July, pp. 1–16, 2024, doi: 10.3389/feduc.2024.1379796.

[8] L. Ma, "An Immersive Context Teaching Method for College English Based on Artificial Intelligence and Machine Learning in Virtual Reality Technology," *Mob. Inf. Syst.*, vol. 2021, 2021, doi: 10.1155/2021/2637439.

[9] S. Atalla *et al.*, "An Intelligent Recommendation System for Automating Academic Advising Based on Curriculum Analysis and Performance Modeling," *Mathematics*, vol. 11, no. 5, 2023, doi: 10.3390/math11051098.

[10] P. Reddy, K. Chaudhary, and S. Hussein, "A digital literacy model to narrow the digital literacy skills gap," *Heliyon*, vol. 9, no. 4, p. e14878, 2023, doi: 10.1016/j.heliyon.2023.e14878.

[11] S. Nikou, M. De Reuver, and M. Mahboob Kanafi, "Workplace literacy skills—how information and digital literacy affect adoption of digital technology," *J. Doc.*, vol. 78, no. 7, pp. 371–391, 2022, doi: 10.1108/JD-12-2021-0241.

[12] A. Morgan, R. Sibson, and D. Jackson, "Digital demand and digital deficit: conceptualising digital literacy and gauging proficiency among higher education students," *J. High. Educ. Policy Manag.*, vol. 44, no. 3, pp. 258–275, 2022, doi: 10.1080/1360080X.2022.2030275.

[13] A. L. P. Talbot and Z. Barends, "Motor development: A precursor to support Grade R literacy learning - Lessons from BuddingQ," *Read. Writ. (South Africa)*, vol. 15, no. 1, pp. 1–10, 2024, doi: 10.4102/rw.v15i1.459.

[14] I. R. W. Atmojo, R. Ardiansyah, and W. Wulandari, "Classroom Teacher's Digital Literacy Level based on Instant Digital Competence Assessment (IDCA) Perspective," *Mimb. Sekol. Dasar*, vol. 9, no. 3, pp. 431–445, 2022, doi: 10.53400/mimbar-sd.v9i3.51957.

[15] R. Afrilyasanti, Y. Basthomi, and E. L. Zen, "The Implications of Instructors' Digital Literacy Skills for their Attitudes to Teach Critical Media Literacy in EFL Classrooms," *Int. J. Media Inf. Lit.*, vol. 7, no. 2, pp. 283–292, 2022, doi: 10.13187/ijmil.2022.2.283.

[16] M. Li and Z. Yu, "Teachers' Satisfaction, Role, and Digital Literacy during the COVID-19 Pandemic," *Sustain.* , vol. 14, no. 3, 2022, doi: 10.3390/su14031121.

[17] K. Erwin and S. Mohammed, "Digital Literacy Skills Instruction and Increased Skills Proficiency," *Int. J. Technol. Educ. Sci.*, vol. 6, no. 2, pp. 323–332, 2022, doi: 10.46328/ijtes.364.

[18] M. M. Hassan and T. Mirza, "The Digital Literacy in Teachers of the Schools of Rajouri (J&K)-India: Teachers Perspective," *Int. J. Educ. Manag. Eng.*, vol. 11, no. 1, pp. 28–40, 2021, doi: 10.5815/ijeme.2021.01.04.

[19] O. A. Alismaiel, J. Cifuentes-Faura, and W. M. Al-Rahmi, "Online Learning, Mobile Learning, and Social Media Technologies: An Empirical Study on Constructivism Theory during the COVID-19 Pandemic," *Sustain.*, vol. 14, no. 18, pp. 1–15, 2022, doi: 10.3390/su141811134.

[20] M. Muftah, "Impact of social media on learning English language during the COVID-19 pandemic," *PSU Res. Rev.*, vol. 8, no. 1, pp. 211–226, 2023, doi: 10.1108/PRR-10-2021-0060.

[21] E. Zarzycka, J. Krasodomska, A. Mazurczak-Mąka, and M. Turek-Radwan, "Distance learning during the COVID-19 pandemic: students' communication and collaboration and the role of social media," *Cogent Arts Humanit.*, vol. 8, no. 1, 2021, doi: 10.1080/23311983.2021.1953228.

[22] V. Shunkov *et al.*, "Prospective Directions of Using Multimedia Technologies in the Training of Future Specialists," *IJCSNS Int. J. Comput. Sci. Netw. Secur.*, vol. 22, no. 6, pp. 739–746, 2022, doi: 10.22937/IJCSNS.2022.22.6.93.

[23] M. Farrokhnia, S. K. Banihashem, O. Noroozi, and A. Wals, "A SWOT analysis of ChatGPT: Implications for educational practice and research," *Innov. Educ. Teach. Int.*, vol. 61, no. 3, pp. 460–474, 2024, doi: 10.1080/14703297.2023.2195846.

[24] Jamilah, Y. P. Astuti, and M. M. AR, "Implementation of the Campus Teaching Program Batch 3 in Building Scientific Literacy in Elementary Schools," *J. Penelit. Pendidik. IPA*, vol. 9, no. 7, pp. 5140–5149, 2023, doi: 10.29303/jppipa.v9i7.4049.

[25] Rizana, L. Tuhuteru, Y. U. Nuzalifa, R. S. Rachman, and A. Andika, "Overcoming the spread of hoax in social media through strengthening digital literacy contained with character education," *J. Pendidik. dan Konseling*, vol. 5, no. 1, p. 2824, 2023.

[26] M. Nurfazri, F. S. Irwansyah, F. Lukman, M. E. Ruhullah, and S. M. Marinda, "Digital Literacy in Education: An Analysis of Critical Thinking Culture for Preventing the Hoaxes," *J. Perspekt.*, vol. 8, no. 1, p. 1, 2024, doi: 10.15575/jp.v8i1.268.

[27] L. Anthonysamy and P. Sivakumar, "A new digital literacy framework to mitigate misinformation in social media infodemic," *Glob. Knowledge, Mem. Commun.*, vol. 73, no. 6–7, pp. 809–827, 2024, doi: 10.1108/GKMC-06-2022-0142.

[28] A. I. Vodă, C. Cautisanu, C. Grădinaru, C. Tănăsescu, and G. H. S. M. de Moraes, "Exploring Digital Literacy Skills in Economics and Social Sciences and Humanities Students," *Sustain.*, vol. 14, no. 5, pp. 1–31, 2022, doi: 10.3390/su14052483.
[29] J. Haider and O. Sundin, "Information literacy challenges in digital culture: conflicting engagements of trust and doubt," *Inf. Commun. Soc.*, vol. 25, no. 8, pp. 1176–1191, 2022, doi: 10.1080/1369118X.2020.1851389.
[30] V. Milenkova and V. Lendzhova, "Digital Citizenship and Digital Literacy in the Conditions of Social Crisis," *Computers*, vol. 10, no. 40, pp. 1–14, 2021, doi: 10.4324/9781315171517-pt2.
[31] R. Susanti and N. A. Putri, "Adopsi Teknologi Informasi sebagai Literasi Digital Masa Pandemi Covid-19 bagi Para Perempuan di Pedesaan," *Literatus*, vol. 4, no. 1, pp. 61–68, 2022, doi: 10.37010/lit.v4i1.630.
[32] T. G. K. Bryce and E. J. Blown, "Ausubel ' s meaningful learning re-visited," *Curr. Psychol.*, vol. 43, no. February 2023, pp. 4579–4598, 2024.
[33] H. Choudhary and N. Bansal, "Barriers Affecting the Effectiveness of Digital Literacy Training Programs (DLTPs) for Marginalised Populations: A Systematic Literature Review," *J. Tech. Educ. Train.*, vol. 14, no. 1, pp. 110–127, 2022, doi: 10.1344/DER.2022.41.224-248.
[34] M. Alanoglu, S. Aslan, and S. Karabatak, "Do teachers' educational philosophies affect their digital literacy? The mediating effect of resistance to change," *Educ. Inf. Technol.*, vol. 27, no. 3, pp. 3447–3466, 2022, doi: 10.1007/s10639-021-10753-3.
[35] J. Ogunode and A. J. Ndayebom, "Digitalization of Higher Education in Nigeria: Benefits, Problems and Solutions," *Electron. Res. J. Soc. Sci. Humanit.*, vol. 5, no. II, pp. 103–115, 2023.
[36] F. N. Pazilah, H. Hashim, M. M. Yunus, and K. R. M. Rafiq, "Exploring Malaysian ESL Pre-service Teachers' Perceptions on Knowledge of Learners, Digital Literacy and 21st Century Competency," *Int. J. Learn. Teach. Educ. Res.*, vol. 23, no. 1, pp. 300–317, 2024, doi: 10.26803/ijlter.23.1.15.
[37] F. T. DİKKARTIN ÖVEZ and S. DEMİR, "Examination of Secondary School Mathematics Teachers' Digital Literacy Self-Efficacy, E-learning Readiness, Technology Acceptance Levels, and Attitudes Towards Distance Education," *Necatibey Eğitim Fakültesi Elektron. Fen ve Mat. Eğitimi Derg.*, vol. 17, no. Özel Sayı, pp. 371–397, 2023, doi: 10.17522/balikesirnef.1352405.
[38] B. W. Pratolo and H. A. Solikhati, "Investigating teachers' attitude toward digital literacy in EFL classroom," *J. Educ. Learn.*, vol. 15, no. 1, pp. 97–103, 2020, doi: 10.11591/edulearn.v15i1.15747.
[39] W. K. Zimmer and S. D. Matthews, "A virtual coaching model of professional development to increase teachers' digital learning competencies," *Teach. Teach. Educ.*, vol. 109, no. January, p. 103544, 2022, doi: 10.1016/j.tate.2021.103544.
[40] V. Ahmed and A. Opoku, *Technology supported learning and pedagogy in times of crisis: the case of COVID-19 pandemic*, vol. 27, no. 1. Springer US, 2022. doi: 10.1007/s10639-021-10706-w.
[41] H. M. Alakrash and N. A. Razak, "Technology-based language learning: Investigation of digital technology and digital literacy," *Sustain.*, vol. 13, no. 21, p. 12304, 2021, doi: 10.3390/su132112304.
[42] G. M. Francom, S. J. Lee, and H. Pinkney, "Technologies, Challenges and Needs of K-12 Teachers in the Transition to Distance Learning during the COVID-19 Pandemic," *TechTrends*, vol. 65, no. 4, pp. 589–601, 2021, doi: 10.1007/s11528-021-00625-5.
[43] M. Al-Amin, A. Al Zubayer, B. Deb, and M. Hasan, "Status of tertiary level online class in Bangladesh: students' response on preparedness, participation and classroom activities," *Heliyon*, vol. 7, no. 1, p. e05943, 2021, doi: 10.1016/j.heliyon.2021.e05943.
[44] M. A. Adarkwah, "An Outbreak of Online Learning in the COVID-19 Outbreak in Sub-Saharan Africa: Prospects and Challenges.," *Online Submiss.*, vol. 21, no. 2, pp. 1–10, 2021.
[45] C. M. Azionya and A. Nhedzi, "the Digital Divide and Higher Education Challenge With Emergency Online Learning: Analysis of Tweets in the Wake of the Covid-19 Lockdown," *Turkish Online J. Distance Educ.*, vol. 22, no. 4, pp. 164–182, 2021, doi: 10.17718/tojde.1002822.
[46] N. Guven Ozdemir and M. Sonmez, "The relationship between nursing students' technology addiction levels and attitudes toward e-learning during the COVID-19 pandemic: A cross-sectional study," *Perspect. Psychiatr. Care*, vol. 57, no. 3, pp. 1442–1448, 2021, doi: 10.1111/ppc.12710.
[47] I. Turyadi, Zulkifli, M. R. Tawil, H. Ali, and S. Abdurrahman, "The role of digital leadership in organizations to improve employee performance and business success," *J. Ekon.*, vol. 12, no. 02, pp. 1671–1677, 2023.
[48] N. Che Mat and K. A. Jamaludin, "Effectiveness of Practices and Applications of Student-Centered Teaching and Learning in Primary Schools: A Systematic Literature Review," *Int. J. Acad. Res. Progress. Educ. Dev.*, vol. 13, no. 3, pp. 1025–1044, 2024, doi: 10.6007/ijarped/v13-i3/21733.
[49] R. Afrilyasanti, Y. Basthomi, and E. L. Zen, "Factual vs. Fake News: Teachers' Lens on Critical Media Literacy Education in EFL Classes," *J. Interact. Media Educ.*, vol. 2023, no. 1, pp. 1–16, 2023, doi: 10.5334/jime.781.
[50] A. Gouseti, M. Lakkala, J. Raffaghelli, M. Ranieri, A. Roffi, and L. Ilomäki, "Exploring teachers' perceptions of critical digital literacies and how these are manifested in their teaching practices," *Educ. Rev.*, vol. 76, no. 7, pp. 1751–1785, 2024, doi: 10.1080/00131911.2022.2159933.
[51] A. Boonmoh, J. Thidaporn, and S. Karpklon, "Teachers ' Perceptions and Experience in Using Technology for the Classroom Review of Literature," *Comput. Assist. Lang. Learn. Electr. J.*, vol. 22, no. 1, pp. 1–24, 2021, [Online]. Available: http://callej.org/journal/22-1/Boonmoh-Jumpakate-Karpklon2021.pdf
[52] S. Chandrakumar and R. Vivek, "A critical review of the mixed method application and its criticism," *Soc. Work Educ.*, vol. 10, no. 2, pp. 242–253, 2023, doi: 10.25128/2520-6230.23.2.8.
[53] J. Azer, B. Taheri, and M. Gannon, "A Critical View on Mixed-Method Approaches to Tourism and Hospitality Research," *Adv. Res. Methods Hosp. Tour.*, vol. 9781801175517, no. April 2021, pp. 5–24, 2022, doi: 10.1108/978-1-80117-550-020221002.
[54] R. Hoffmann, B. Šedová, and K. Vinke, "Improving the evidence base: A methodological review of the quantitative

climate migration literature," *Glob. Environ. Chang.*, vol. 71, no. March, 2021, doi: 10.1016/j.gloenvcha.2021.102367.
[55] P. C. Susanto, L. Yuntina, E. Saribanon, and J. P. Soehaditama, "Qualitative Method Concepts : Literature Review , Focus Group Discussion , Ethnography and Grounded Theory," *Siber J. Adv. Multidiscip.*, vol. 2, no. 2, pp. 262–275, 2024.
[56] K. R. Subedi, "Determining the Sample in Qualitative Research," *Sch. J.*, vol. 4, no. December, pp. 1–13, 2021, doi: 10.3126/scholars.v4i1.42457.
[57] S. J. Stratton, "Population Research: Convenience Sampling Strategies," *Prehosp. Disaster Med.*, vol. 36, no. 4, pp. 373–374, 2021, doi: 10.1017/S1049023X21000649.
[58] A. Bazen, F. K. Barg, and J. Takeshita, "Research Techniques Made Simple: An Introduction to Qualitative Research," *J. Invest. Dermatol.*, vol. 141, no. 2, pp. 241-247.e1, 2021, doi: 10.1016/j.jid.2020.11.029.
[59] A. Rahman and M. G. Muktadir, "SPSS: An Imperative Quantitative Data Analysis Tool for Social Science Research," *Int. J. Res. Innov. Soc. Sci.*, vol. 05, no. 10, pp. 300–302, 2021, doi: 10.47772/ijriss.2021.51012.
[60] A. Purwanto *et al.*, "Education Research Quantitative Analysis for Little Respondents: Comparing of Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS," *J. Stud. Guru dan Pembelajaran*, vol. 4, no. 2, pp. 335–350, 2021, [Online]. Available: https://e-journal.my.id/jsgp/article/view/1326
[61] Mark G. Maffett and Jorge O. Brusa, "The Effect of Online Advertising on Consumer Buying Interest in Online Selling Applications with Customer Satisfaction As An Intervening Variable (Case Study of Medical Doctor and Nurses in Chicago)," *MEDALION J. Med. Res. Nursing, Heal. Midwife Particip.*, vol. 3, no. 4, pp. 136–143, 2022, doi: 10.59733/medalion.v3i4.63.
[62] A. K. Septi, S. Sudirman, and F. Fahruddin, "Evaluation of the Performance of Supervisors in Planning the Supervision Program for the State Tsanawiyah Madrasah in Mataram City," *Path Sci.*, vol. 8, no. 8, pp. 2015–2021, 2022, doi: 10.22178/pos.84-3.
[63] Y. Su, "Delving into EFL teachers' digital literacy and professional identity in the pandemic era: Technological Pedagogical Content Knowledge (TPACK) framework," *Heliyon*, vol. 9, no. 6, p. e16361, 2023, doi: 10.1016/j.heliyon.2023.e16361.
[64] H. Abubakir and Y. Alshaboul, "Unravelling EFL teachers' mastery of TPACK: Technological pedagogical and content knowledge in writing classes," *Heliyon*, vol. 9, no. 6, p. e17348, 2023, doi: 10.1016/j.heliyon.2023.e17348.
[65] H. Hasanah, "The Digital Da'wah Strategy Amid the Flow of Hoax Information Huswatun," *J. Sci. Stud. Multidiscip. Res.*, vol. 1, no. 2, pp. 131–138, 2024.
[66] N. Khan, A. Sarwar, T. B. Chen, and S. Khan, "Connecting digital literacy in higher education to the 21st century workforce Nasreen Khan Abdullah Sarwar Tan Booi Chen Recommended citation : Connecting digital literacy in higher education to the 21st century workforce," *Knowl. Manag. E-Learning*, vol. 14, no. 1, pp. 46–61, 2022.
[67] T. Mayisela, "A Practice-Based Approach to Developing First-Year Higher Education Students' Digital Literacy: A Case Study in a Developing Country," *Int. J. Mob. Blended Learn.*, vol. 14, no. 3, pp. 1–14, 2022, doi: 10.4018/IJMBL.314582.
[68] E. N. Purnomo, A. Imron, B. B. Wiyono, A. Y. Sobri, and Z. A. Dami, "Transformation of Digital-Based School Culture: implications of change management on Virtual Learning Environment integration," *Cogent Educ.*, vol. 11, no. 1, pp. 1–18, 2024, doi: 10.1080/2331186X.2024.2303562.
[69] H. Cho, J. Cannon, R. Lopez, and W. Li, "Social media literacy: A conceptual framework," *New Media Soc.*, vol. 26, no. 2, pp. 941–960, 2024, doi: 10.1177/14614448211068530.
[70] S. Syaharuddin, M. Mutiani, M. R. N. Handy, E. W. Abbas, and J. Jumriani, "Putting transformative learning in higher education based on linking capital," *J. Educ. Learn.*, vol. 16, no. 1, pp. 58–64, 2022, doi: 10.11591/edulearn.v16i1.20373.
[71] D. Gustian, M. Marzuki, N. Nukman, Y. Purnama, and D. Abdurrahman, "Synergies in Education: Integrating Character, Literacy, and Technology for Enhanced Outcomes: Current Perspectives From Global Education Experts," *Int. J. Teach. Learn.*, vol. 2, no. 2, pp. 498–512, 2024, [Online]. Available: https://injotel.org/index.php/12/article/view/84/112
[72] S. Wahjusaputri and T. I. Nastiti, "Digital literacy competency indicator for Indonesian high vocational education needs," *J. Educ. Learn.*, vol. 16, no. 1, pp. 85–91, 2022, doi: 10.11591/edulearn.v16i1.20390.