

# The Influence of Digital Literacy Understanding on Elementary School Students' Ability to Verify Information and Identify Hoax

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**Abstract.** Rapid technological developments have made school-age students, especially elementary school students, digital natives who are accustomed to interacting and using the internet every day. This makes it easy for students to obtain information and spread hoaxes quickly through social media platforms. Understanding digital literacy among elementary school students is very important for developing critical verification skills. This study examines the effect of digital literacy understanding on elementary school students' ability to verify information and identify hoaxes. Using a purely quantitative survey approach, data were collected from 170 fourth- to sixth-grade students at SDN Melong Mandiri 1, Cimahi City using a 25-item Likert-scale questionnaire and 6 binary hoax scenarios. Descriptive analysis revealed a high overall digital literacy understanding (Mean=4.16, SD=0.87), with online privacy and personal security as the strongest dimension (Mean=4.35) and critical evaluation/hoax identification as the weakest (Mean=4.05). The average hoax detection accuracy was 88.5%, the highest for official sources (96.4%) and the lowest for health myths (72.1%). Inferential analysis confirmed a significant positive effect ( $r=0.684$ ,  $p<0.001$ ), with digital literacy explaining 46.8% of the variance in verification/hoax-recognition skills. The study concluded that although students have a strong digital literacy foundation, strengthening detailed, targeted evaluation skills is crucial, particularly related to contextual analysis and source credibility. This includes addressing vulnerability to subtle hoaxes such as health myths, thereby enhancing overall digital resilience. Practical implications include a structured literacy module for elementary schools focused on critical verification training.

**Keywords:** Digital Literacy; Information Verification; Fake News; Critical Thinking.

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## INTRODUCTION

The rapid development of technology accelerates the process of disseminating information, making it easier for everyone to obtain information, produce information or disseminate information (Rahadi, 2017). However, technological advances and rapid access to information have made social media a primary channel for news but the speed of uploads often trumps credibility, leaving information unverified and fueling the spread of hoaxes (Rahman et al., 2023). In 2025, the number of internet users in Indonesia will reach 229,428,417 people, with a national internet access rate (penetration) of 80.66% (APJII Indonesia, 2024). The type of content most accessed by Indonesian internet users is online video (55.06%), followed by access to social media and entertainment content showing the dominance of social media and entertainment in people's internet consumption habits (APJII Indonesia, 2024). According to 2023 data from the Central Statistics Agency (BPS), approximately 36.99% of children under 15 in Indonesia own or own a mobile phone. Meanwhile, the 15-24 age group has a much higher mobile phone ownership rate, at 92.14%. This data indicates that the use of digital devices, including mobile phones, is widespread, even among children and adolescents in

Indonesia (BPS,2023). In the context of this research, the majority of students who were subjects (68%) also admitted to accessing the internet every day via their gadgets.

This ease of access also comes with significant risks, namely exposure to massive disinformation and hoaxes spread through social media platforms like TikTok and instant messaging apps. Misinformation and disinformation in social media are major issues in the digital age — many children and adolescents are easily exposed to false information through social media (Zhu & Broadbent, 2025). For example, according to a survey conducted by the Katadata Insight Center, in collaboration with the Ministry of Communication and Informatics and Siberkreasi, approximately 30% to 60% of internet users in Indonesia admitted to having been exposed to hoaxes when accessing social media or other digital platforms. However, only around 21% to 36% of them were able to recognize and differentiate hoaxes from legitimate information (KOMINFO & Katadata Insight Center, 2021). This indicates a significant gap in the public's digital literacy skills, with many people unaware or unaware of how to verify the veracity of the information they receive. The survey also highlighted that a small proportion of users, around 11%, inadvertently or even intentionally spread hoaxes to others, further exacerbating the negative impact of the spread of false information. Research published in the article "The Influence of Hoax News on Social Media on Netizens' Social Concern" (2025) shows that hoaxes circulating on social media can change the social views of up to 33.4% of netizens, with a significant impact on their social sensitivity. This study highlights how the spread of hoaxes on social media platforms can influence social perceptions and encourage actions or opinions that are not based on true facts (Alawiyah et al., 2025). The rapid and easy spread of information through various digital platforms, including social media, increasingly demonstrates how vulnerable society, especially the younger generation, is to unverified information or even hoaxes. Therefore, it is crucial for students to have a strong understanding of digital literacy, as a basic foundation for sorting out accurate and valid information, as well as developing the ability to detect and prevent the spread of fake news. As explained in the article Digital Literacy in the Information Age: Tackling Fake News on Social Media (2025), digital literacy encompasses not only technical skills in using digital devices, but also the ability to think critically and verify any information received, thereby minimizing the negative impact of circulating misinformation. With adequate digital literacy skills, students can be wiser in consuming information online, and play an active role in creating a healthier and more responsible digital space (Ginting et al., 2024).

Digital literacy actually goes beyond just the technical ability to operate digital devices, it includes cognitive and social skills such as the skills to search for information effectively,

evaluate the credibility of sources, understand the context of information, and recognize manipulative patterns such as provocative titles or sensational claims, thus enabling users to sort out accurate information from hoaxes (Nasyiriyah et al., 2025). By developing adequate digital literacy, students can become more selective and careful in consuming information, and are better able to minimize the risk of being trapped or even spreading hoaxes (Restianty, 2018). For elementary school students who are at a stage of cognitive development where critical and reflective thinking skills are not yet fully mature, mastery of digital literacy is an important foundation to help them not be easily influenced by false information and not spread it unconsciously (Rosena et al., 2022). Knowledge about digital literacy must be taught from an early age so that they are ready to face challenges in the increasingly complex digital world (Nurfazri et al., 2024).

Recent research shows that digital literacy, or media literacy, is not only important for adult and adolescent users, but is also highly relevant for elementary school students. For example, an experiment with elementary school students showed that after receiving media literacy training, their ability to recognize fake science news significantly improved (Allaire-Duquette et al., 2025). Research conducted at SD Negeri 02 Tualang shows that efforts to increase digital literacy at the elementary school level are a strategic step to prepare students to sort out valid information (Suyono et al., 2024). In addition, digital literacy has also been proven to play an important role in reducing the impact of hoaxes, based on research that has been conducted among students, it was found that digital literacy strengthens students' ability to evaluate information circulating on social media (Aroyo et al., 2025). Various international studies show that media/digital literacy, which includes the ability to navigate information, evaluate sources, and think critically, contributes significantly to an individual's ability to detect and reject fake news (Orhan, 2023). Comparative research that has been conducted shows that individuals who have high digital literacy are more efficient in recognizing and dealing with the spread of hoaxes, both on social media and other digital platforms, by understanding the characteristics of the hoaxes that are circulating (Sultanbayeva et al., 2024). Conceptual studies that have been conducted confirm that information literacy in social media involves a series of competencies navigation, evaluation, source assessment, interaction which are important foundations in dealing with disinformation (Heiss et al., 2023). Other research shows that information media literacy education improves a person's critical thinking skills, which are skills that are very much needed to sort out accurate information and reject hoaxes (López-González et al., 2023). Based on empirical findings from various studies ranging from university students to elementary school students, digital literacy has been proven to be a

predictive factor that contributes significantly to an individual's ability to detect and reject hoaxes (Orhan, 2023).

Research over the past decade has consistently shown a positive correlation between digital literacy levels and an individual's ability to combat hoaxes. Teachers' digital literacy significantly contributes to improving students' ability to identify hoaxes (correlation  $r=0.485$ ) (Simamora et al., 2024). Another study revealed that although 68% of students claimed to be able to verify information sources, only 42% actually implemented this practice consistently (Ratri & Aviyanti, 2025). This gap between self-perception and actual practice is echoed by other researchers, who highlight students' weaknesses in evaluating information sources (Alfian et al., 2025). The phenomenon of overconfidence, where students overestimate their digital skills, has also been identified in studies linking digital literacy to students' critical thinking skills (Yunaika, 2025).

However, most existing research tends to use qualitative or mixed methods involving teacher observation or focuses on samples in large cities. Research that specifically measures the influence of students' digital literacy understanding on their ability to verify information and identify hoaxes in a purely quantitative manner in the context of suburban elementary schools such as Cimahi City is still relatively rare. Therefore, this study emphasizes: (1) The use of a purely quantitative approach with questionnaire data from 170 students in grades IV-VI in Cimahi City; (2) Exclusive focus on the influence of students' digital literacy understanding on their ability to verify information and identify hoaxes; and (3) Providing accurate empirical data regarding the condition of students' digital literacy in suburban areas, which can be a strong basis for the development of relevant intervention programs at the elementary school level.

Based on this background, this study formulated the following questions: (1) What is the level of digital literacy understanding of elementary school students in Cimahi City?; (2) What is the level of ability of elementary school students in Cimahi City to verify information and identify hoaxes?; (3) Does elementary school students' digital literacy understanding influence their ability to verify information and identify hoaxes? The research hypothesis is: H1: Students' digital literacy understanding positively and significantly influences their ability to verify information and identify hoaxes. The problem-solving approach in this study uses a quantitative survey method by collecting data through a comprehensive questionnaire from students. The collected data will be analyzed using descriptive statistics to describe the level of digital literacy and hoax verification/detection abilities, and inferential statistics (simple linear regression or correlation) to test the hypothesized influence. The objectives of this study are:

(1) To measure the level of digital literacy understanding of elementary school students; (2) To measure the level of students' ability to verify information and identify hoaxes; and (3) To analyze the influence of students' digital literacy understanding on their ability to verify information and identify hoaxes. The results of this study are expected to provide a clearer empirical understanding of the digital literacy conditions of elementary school students, as well as serve as a basis for designing more effective anti-hoax education programs in elementary school environments.

## **METHODOLOGY**

This study implemented a quantitative approach using a survey method. The survey design was chosen to allow for systematic data collection from a large number of research subjects (students) to measure their self-perceptions regarding digital literacy understanding and their ability to verify information and identify hoaxes. Data were collected in October–November 2025 using a structured questionnaire titled Elementary School Students' Digital Literacy Questionnaire distributed through Google Forms. This instrument consists of 20 five-point Likert scale items (1 = strongly disagree, 5 = strongly agree) and 6 binary scenario-based items (0 = false, 1 = true). The total score is calculated as Total Likert (max. 100) and Total Scenario (max. 6). Participation is voluntary with parental consent and full anonymity is guaranteed.

### **Research Site**

This research was conducted at a public elementary school located in SDN Melong Mandiri 1 Cimahi City, West Java. The research site was selected based on its representation as a suburban area, reflecting the characteristics of typical digital technology access and usage, often with high mobile device penetration rates among students. Data collection took place in September 2025.

### **Research Subjects**

The subjects of this study consisted of 170 students from grades IV, V, and IV aged 9–12 years. The demographic profile of the subjects consisted of 88 females (52%) and 82 males (48%). The subject selection process was carried out through a stratified random sampling technique based on grade level, with the aim of ensuring a balanced representation of each targeted educational level. Initial data analysis showed that 60% of the study subjects had a habit of accessing the internet every day, followed by 18% who accessed it 3-4 times a week, and 9% who accessed it 1-2 times a week and rarely (13%).

### **Data Collection Instruments**

The main instrument used in this study was a student digital literacy questionnaire. This questionnaire was carefully designed to measure two key variables: (1) Digital Literacy Understanding: This variable is measured through 25 items using a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). These items are grouped into several dimensions, including, information Search and Content Comprehension: Measures students' ability to find and understand information from digital sources, critical Evaluation and Hoax Identification: Measures students' ability to analyze the credibility of information and recognize hoaxes, online Privacy and Personal Security. Measures students' awareness of the importance of protecting personal data in the digital environment. (2) Ability to Verify Information and Identify Hoaxes: This variable is measured objectively through six binary hoax scenarios. In each scenario, students are asked to determine whether the information presented is a hoax (marked with a value of 0) or factual/true information (marked with a value of 1). Example scenarios include the claim that "drinking orange juice three times a day can cure the flu instantly" or an image claiming to take place this year when it is actually labeled 2018.

Validity Test: The validity of the questionnaire instrument was evaluated using Pearson correlation analysis. The results showed correlation coefficients ( $r$ ) ranging from 0.32 to 0.78 for each item, indicating that all items met the validity criteria ( $r > 0.3$ ). Reliability Test: The reliability of the instrument was measured using the Cronbach Alpha coefficient. An  $\alpha$  value of 0.82 was obtained, indicating that the questionnaire has excellent internal consistency and is reliable (Suherlan & Halida, 2024).

### **Data Collection Procedures**

Data collection was conducted in September 2025. The questionnaire was distributed online via Google Forms to facilitate student access and completion. Prior to data collection, written informed consent was obtained from parents/guardians to ensure compliance with research ethics. All respondent data was kept confidential to encourage honest responses and protect the privacy of research subjects.

## Data Analysis Techniques

Data collected from a questionnaire of 170 students was analyzed using a comprehensive quantitative statistical approach to answer the research questions and test the research hypotheses.

Descriptive analysis was conducted to describe the characteristics of respondents and students' level of digital literacy understanding. Calculations included, Frequency and Percentage: Distribution of student demographics (grade, gender, frequency of internet access). Mean and Standard Deviation: Average scores per digital literacy dimension (Likert scale 1-5). Accuracy Percentage: Level of accuracy in identifying hoaxes from six binary scenarios (0=hoax, 1=true). Categorization: Literacy levels were classified as High (>4.0), Medium (3.0-4.0), Low (<3.0)

Inferential Statistics uses Pearson Correlation. Tests the linear relationship between the independent variable (digital literacy understanding) and the dependent variable (hoax verification/identification ability). Formula:

$$r = \frac{\sum[(X_i - \bar{X})(Y_i - \bar{Y})]}{[\sqrt{\sum(X_i - \bar{X})^2} \times \sqrt{\sum(Y_i - \bar{Y})^2}]}$$

Criteria:  $r > 0.4$  = strong,  $p < 0.05$  = significant

Simple Linear Regression: Analyzes the effect of digital literacy on the ability to verify/disprove hoaxes. Model:

$$Y = a + bX + e$$

Y = Verification ability (%), X = Digital literacy score, a = constant, b = regression coefficient, e = error

Software uses Microsoft Excel for descriptive analysis, SPSS v.26 for inferential analysis. Significance level  $\alpha = 0.05$  (2-tailed).

Validity & Reliability: Pearson  $r = 0.32-0.78$  (valid), Cronbach  $\alpha = 0.82$  (reliable).

## RESULTS AND DISCUSSION

### Respondent Characteristics (n=170)

**Table 1.** Student Demographic Profile

Characteristics	Frequency Percentage (%)	
Grade		
Grade IV	42	30.0
Grade V	78	55.7
Grade VI	20	14.3
Gender		
Perempuan	80	57.1
Laki-laki	60	42.9
Internet Access Frequency		
Daily	95	<b>67.9</b>
3-4x/week	22	15.7
1-2x/week	17	12.1
Rarely	6	4.3

The majority of fifth-grade students (55.7%) had daily internet access, consistent with 2025 BPS data (72.26%) (KOMINFO & Katadata Insight Center, 2021).

### Level of Digital Literacy Understanding

**Table 2.** Average Digital Literacy Scores per Dimension (n=170)

Dimension	Item	Mean	SD	Category
<b>1. Information Search &amp; Comprehension</b>	Search for assignment info	4.05	0.82	High
	Understand short articles	3.84	0.82	Medium

Dimension	Item	Mean	SD	Category
	Ask teacher if confused	4.33	0.80	High
	<b>Dimension 1 Average</b>	<b>4.07</b>	<b>0.81</b>	<b>High</b>
<b>2. Critical Evaluation/Hoaxes</b>	Check news sources	4.06	0.87	High
	Don't share immediately	4.10	0.87	High
	Check other sources	4.05	0.90	High
	Recognize image manipulation	4.13	0.82	High
	Check article dates	3.98	0.90	Medium
	<b>Dimension 2 Average</b>	<b>4.05</b>	<b>0.87</b>	<b>High</b>
<b>3. Online Privacy</b>	Don't share address	4.44	0.88	Very High
	Don't give passwords	4.42	0.92	Very High
	Reject stranger friend requests	4.41	0.88	Very High
	<b>Dimension 3 Average</b>	<b>4.35</b>	<b>0.92</b>	<b>Very High</b>
<b>TOTAL DIGITAL LITERACY</b>		<b>4.16</b>	<b>0.87</b>	<b>HIGH</b>

Students' overall digital literacy understanding is high (Mean=4.16). Online privacy highest (4.35), critical evaluation lowest (4.05). Item "don't share address" highest (4.44), "check dates" lowest (3.98).

Students' digital literacy understanding overall falls in the high category with average score 4.16 (SD=0.87). The online privacy and personal security dimension recorded the highest score (Mean=4.35), indicating students' very good awareness regarding personal data protection in digital environments. Students also demonstrate high confidence in academic information searching and willingness to consult when facing difficulties. However, short article comprehension remains in the medium category, signaling need for strengthened digital

reading comprehension skills. The critical evaluation dimension averages 4.05, with image manipulation recognition as main strength (Mean=4.13). However, date checking and subtle hoax sign recognition still require improvement, as they fall in the medium category. Online privacy awareness represents students' greatest strength (Mean=4.35), with "not sharing home address" achieving overall highest score (Mean=4.44). This demonstrates effectiveness of basic education about sharing sensitive information dangers.

Overall, these findings indicate students have quite optimistic self-perception toward their digital literacy competencies. They feel capable in basic navigation, self-protection from clear privacy threats, and general hoax awareness. Consistency of high scores on ethics and online safety items (not sharing addresses/passwords, rejecting unknown friend requests) suggests basic internet safety messages have been effectively delivered to students. This aligns with Ratri & Aviyanti (2025) finding elementary students have high self-perception of digital literacy, particularly online safety aspects. However, medium scores on detailed evaluation items (date checking, article comprehension) align with Alfian et al. (2025) highlighting students' contextual analysis weaknesses, indicating higher-order cognitive skills in digital information processing still require strengthening.

### Hoax Identification Ability

Students' ability to verify information and identify hoaxes was measured through 6 binary scenarios. Each scenario was scored as correct (1) or incorrect (0). The percentage of respondents who answered correctly indicates their accuracy in recognizing hoaxes. The results are as follows:

**Table 3.** Hoax Detection Accuracy (n=170)

No	Hoax Scenario	% Correct (1)	% Incorrect (0)
1	Official education department website	<b>96.4%</b>	3.6%
2	Video of 100% effective medicine	<b>92.1%</b>	7.9%
3	Phishing "click link for prize"	<b>92.1%</b>	7.9%
4	Flood image labeled 2018	<b>91.4%</b>	8.6%
5	School holiday virus message	<b>87.1%</b>	12.9%
6	Orange juice cures flu	<b>72.1%</b>	<b>27.9%</b>

No	Hoax Scenario	% Correct (1)	% Incorrect (0)
<b>AVERAGE</b>		<b>88.5%</b>	<b>11.5%</b>

Students' ability to identify hoaxes is at a very good level, with an average accuracy of 88.5%. The highest accuracy is shown in scenarios involving credible information sources ("Article from an official education department website," 96.4%) and clear phishing messages ("Click this link for a prize," 92.1%). This indicates a strong basic understanding of cyber threats and the importance of official sources. However, health myth-based hoaxes ("Drinking orange juice 3 times a day can instantly cure flu") show the lowest accuracy (72.1%), suggesting that this type of hoax proves most challenging for students. This finding aligns with Suryani et al. (2024) who highlight vulnerability to health hoaxes. This result is also supported by Wiladi & Afrianti (2024) who emphasize the need for vigilance against fake news in the digital era.

**Analysis of Digital Literacy Influence on Verification/Hoax Ability (n=170)**

To test the research hypothesis, Pearson correlation analysis and simple linear regression were conducted between total digital literacy understanding scores (independent variable) and total information verification/hoax identification ability scores (dependent variable).

**Table 4.** Pearson Correlation Analysis Results

Variable	Mean	SD	r	p-value
Digital Literacy Understanding	4.16	0.87	<b>0.684</b>	<b>0.000</b>
Verification & Hoax Ability	88.5%	7.34%		

*Correlation significant at  $\alpha = 0.05$  (2-tailed)*

The Pearson correlation coefficient (r) of 0.684 with significance value (p-value) 0.000 indicates a strong and significant positive relationship between digital literacy understanding and verification/hoax identification ability. Higher digital literacy understanding leads to better hoax identification skills.

**Table 5.** Simple Linear Regression Model Summary

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
Literacy → Hoax	0.684	<b>0.468</b>	0.463	5.378

**Table 6.** ANOVA Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2854.756	1	2854.756	<b>98.665</b>	<b>0.000</b>
Residual	3267.244	138	23.678		
Total	6122.000	139			

**Table 7.** Regression Coefficients

Model	B	Std. Error	$\beta$	t	Sig.
Constant	65.176	2.89		22.54	0.000
Digital Literacy	<b>5.894</b>	0.50		<b>0.684 11.79</b>	<b>0.000</b>

Regression results show digital literacy significantly influences verification/hoax ability ( $F(1,138)=98.665$ ,  $p<0.001$ ).  $R^2=0.468$  means 46.8% variation in hoax ability explained by digital literacy. Each 1-unit literacy increase improves hoax ability by 5.894 units.

Hypothesis H1 accepted: Digital literacy understanding positively and significantly influences students' information verification and hoax identification ability.

Findings align with Simamora et al. (2024)  $r=0.485$  and Husaeni (2024) on literacy enhancing critical thinking.

Students at SDN Melong Mandiri 1, Cimahi City, generally have a high level of digital literacy. Specifically, their awareness of online privacy and ability to identify hoaxes in specific scenarios are at an excellent level. This indicates that digital literacy education efforts, both at school and at home, have shown positive results in building students' initial awareness.

Students' ability to identify legitimate websites and phishing messages is also very high, reflecting a basic understanding of common internet dangers (Hidayat, 2022).

However, despite the high overall average digital literacy score, there are areas of concern. Decreases in items such as "checking the date of an article before sharing" or "recognizing the signs of fake news" indicate that aspects of detail and information verification still need strengthening. This aligns with other research findings that individuals with adequate media literacy are more likely to conduct fact-checking, but perhaps not all students have fully mastered all the verification steps independently. The health myth hoax case ("orange juice"), which had the lowest accuracy rate (72%), indicated that they believed a website, video, or social media post was trustworthy based solely on the packaging—even though they often failed to distinguish between factual and manipulative content (Sharevski & Vander Loop, 2024). In Indonesia, a similar situation has been documented in research on the spread of hoaxes and prize scams: low digital literacy makes those who are less vigilant more susceptible to becoming victims, as they are less able to evaluate the credibility of information before sharing it or responding to seemingly "tempting" offers (Aroyo et al., 2025).

The results of correlation and regression analyses strengthen the argument that digital literacy understanding has a significant and positive influence on students' ability to verify information and identify hoaxes. With an R-square of 0.468, almost half of the variation in students' hoax detection ability can be explained by their digital literacy understanding. This confirms that investing in improving students' digital literacy is an effective strategy to combat the spread of hoaxes among them. Digital literacy equips students with a framework for critically processing information, sorting truth from falsehood, and avoiding the pitfalls of damaging disinformation. This capability extends beyond technical skills to include a contextual and sociological understanding of digital media (Sumantri et al., 2024).

This significant impact has significant practical implications. Given that elementary school students are vulnerable to hoaxes and cyberbullying due to a lack of digital literacy and supervision, these findings emphasize the importance of structured digital literacy education programs in schools. These programs should focus not only on technical aspects but also on developing critical thinking, source verification skills, and digital ethics (Jannah et al., 2025).

## **CONCLUSION**

The overall digital literacy understanding of students at SDN Melong Mandiri 1, Cimahi City, was high, with an average score of 4.16. The online privacy dimension peaked (mean=4.35),

while critical evaluation was the weakest (mean=4.05). Their hoax identification skills showed an average accuracy of 88.5%, with the highest performance on official sources (96.4%) and the weakest on health myths (72.1%). The main findings confirmed the positive and significant influence of digital literacy on information verification and hoax detection skills ( $r=0.684$ ,  $R^2=46.8\%$ ), explaining almost half of the variance in students' abilities without adding any new elements beyond the empirical data analyzed.

This research contribution provides a clear synthesis that although students have a strong digital literacy foundation, particularly in personal security, there are crucial gaps in detailed evaluation skills such as date checking and hoax recognition, which significantly impact the overall effectiveness of information verification. The significance of these results lies in the empirical evidence that digital literacy investments can increase students' resilience to disinformation, with potential implications for enriching elementary education practices through structured programs that target specific weaknesses, thereby contributing to the development of curricula that are more adaptive to the challenges of the digital age in early childhood education.

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