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IFP-BASED DIGITAL LITERACY IN STRENGTHENING STUDENTS' DISCIPLINE, CRITICAL THINKING, AND DIGITAL SECURITY AWARENESS

LITERASI DIGITAL BERBASIS IFP DALAM MEMPERKUAT DISIPLIN, PEMIKIRAN KRITIS, DAN KESADARAN KEAMANAN DIGITAL SISWA

Ririn Widiastutik[1], Ika Rahmawati [2], Ganes Gunansyah[3]
[1,2,3]Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya
[1,2,3]Jl. Lidah Wetan, Kec. Lakarsantri, Surabaya, Jawa Timur
Email: 25010855146@mhs.unesa.ac.id[1], ikarahmawati@unesa.ac.id[2], ganesgunansyah@unesa.ac.id[3]

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Abstract

Digital literacy has become an essential competency in elementary education, requiring students not only to master technology but also to develop responsible digital behaviors. This study aims to describe the implementation of Interactive Flat Panel (IFP)-based digital literacy in strengthening students' discipline, critical thinking, and digital security awareness in elementary schools. This qualitative study was conducted at Ngulanan 1 Public Elementary School using observation and teacher interviews as data collection techniques. The findings reveal that IFP-based digital literacy creates an interactive learning environment that encourages students to engage with digital information, evaluate sources, communicate ethically, and practice safe technology use. The implementation process strengthens students' digital character through structured activities, teacher guidance, and reflective learning. Teachers play a crucial role as facilitators and digital role models. The study concludes that IFP-based digital literacy supports the development of responsible and critical digital citizens in elementary education.

Keywords: *Digital Literacy, Digital Character, Elementary School, Interactive Flat Panel (IFP)*

Abstrak

Literasi digital telah menjadi kompetensi penting dalam pendidikan dasar, yang mengharuskan siswa tidak hanya menguasai teknologi tetapi juga mengembangkan perilaku digital yang bertanggung jawab. Studi ini bertujuan untuk mendeskripsikan implementasi literasi digital berbasis Interactive Flat Panel (IFP) dalam memperkuat disiplin, berpikir kritis, dan kesadaran keamanan digital siswa di sekolah dasar. Studi kualitatif ini dilakukan di SD Negeri Ngulan 1 menggunakan observasi dan wawancara guru sebagai teknik pengumpulan data. Hasil penelitian menunjukkan bahwa literasi digital berbasis IFP menciptakan lingkungan belajar interaktif yang mendorong siswa untuk terlibat dengan informasi digital, mengevaluasi sumber, berkomunikasi secara etis, dan mempraktikkan penggunaan teknologi yang aman. Proses implementasi memperkuat karakter digital siswa melalui kegiatan terstruktur, bimbingan guru, dan pembelajaran reflektif. Guru memainkan peran penting sebagai fasilitator dan panutan digital. Studi ini menyimpulkan bahwa literasi digital berbasis IFP mendukung pengembangan warga digital yang bertanggung jawab dan kritis dalam pendidikan dasar.

Kata Kunci: *Literasi Digital, Karakter Digital, Sekolah Dasar, Interactive Flat Panel (IFP)*

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1. Introduction

The rapid advancement of digital technology has transformed the educational landscape and reshaped the competencies required for learners in the twenty-first century. However, technological proficiency alone is insufficient to prepare students for participation in increasingly complex digital environments. Recent educational studies emphasize that students need not only digital skills but also digital character, which refers to the values, attitudes, and ethical behaviors that guide responsible, safe, and productive interactions with technology (Falloon, 2020; Vuorikari, Kluzer, & Punie, 2022). Digital character includes dimensions such as digital responsibility, digital citizenship, online ethics, privacy awareness, digital empathy, and responsible participation in digital communities. Therefore, developing digital character has become an essential component of contemporary education because students' interactions with digital technologies increasingly involve ethical, social, and security-related considerations (Choi, Cristol, & Gimbert, 2018; Pangrazio & Green, 2021).

The urgency of digital character education is further strengthened by the increasing risks experienced by children in digital environments. Although digital technologies offer significant opportunities for learning, communication, and creativity, they also pose challenges such as cyberbullying, misinformation, privacy violations, excessive technology use, and exposure to harmful online content. Recent studies indicate that young learners remain vulnerable because their digital engagement often develops faster than their ability to evaluate risks and regulate online behavior (Livingstone, Stoilova, & Nandagiri, 2019). Consequently, schools are required to move beyond the traditional view of technology integration as merely a means to improve learning efficiency and instead promote responsible digital citizenship. This approach emphasizes that students must understand not only how to use digital tools but also why, when, and under what ethical principles these technologies should be used.

Digital citizenship has therefore emerged as an important educational framework for preparing students to participate responsibly in digital societies. It involves competencies related to digital rights and responsibilities, information evaluation, online communication, privacy protection, and ethical technology use. At the elementary school level, introducing digital citizenship principles is particularly important because children increasingly interact with digital platforms through online learning systems, educational applications, and internet-based communication. Research highlights that early development of digital citizenship contributes to the formation of safer, more responsible technology habits and supports students' critical evaluation of digital information (Jones & Mitchell, 2016). Thus, elementary education represents a strategic stage for integrating digital literacy with character development.

Digital literacy and digital character represent interconnected dimensions of students' readiness in digital environments. Digital literacy provides students with cognitive abilities to access, analyze, evaluate, and create digital information, whereas digital character determines whether these abilities are applied ethically and responsibly. Previous studies argue that digital literacy education should not be limited to operational skills, as students who can use digital devices may still exhibit unsafe or irresponsible online behavior despite adequate ethical awareness (Ng, Leung, Chu, & Qiao, 2021; Spante, Hashemi, Lundin, & Algers, 2018). Conversely, students with positive values but limited digital competence may struggle in navigate complex digital information environments. Therefore, integrating digital literacy with character education is

considered a more comprehensive approach to developing learners who are technologically competent, critically reflective, and socially responsible.

In response to challenges in implementing digital literacy, educational researchers have increasingly emphasized the importance of developing discipline, critical thinking, and digital security awareness among elementary school students. Discipline helps students regulate their learning behavior and use technology responsibly, while critical thinking enables them to evaluate information, identify misinformation, and make informed decisions in digital environments. At the same time, digital security awareness equips students with the knowledge and attitudes needed to protect personal information and recognize potential online risks (Kohnke & Foung, 2024; Zhao, Llorente, & Gómez, 2021). These competencies are essential foundations for responsible participation in contemporary digital society.

One technological innovation that may support the development of these competencies is the Interactive Flat Panel (IFP). Compared with conventional projectors, IFP provides a more interactive and collaborative learning environment through touch-screen functionality, multimedia integration, and real-time student participation. Unlike computer laboratories that often require dedicated spaces and individual devices, IFP can be integrated directly into classroom instruction, enabling teachers to facilitate collaborative learning, inquiry activities, and interactive discussions more efficiently. Previous studies suggest that interactive digital technologies can enhance student engagement, participation, and active learning, which are important prerequisites for developing higher-order thinking skills and responsible technology use (Getenet & Tualaulelei, 2023; Müller, Otero, & Milrad, 2024).

Although previous studies have examined digital literacy, digital citizenship, and technology-enhanced learning, empirical evidence regarding the role of IFP-based digital literacy in strengthening students' discipline, critical thinking, and digital security awareness simultaneously remains limited, particularly in elementary school settings. Most existing research has focused on academic achievement, technology acceptance, or student engagement rather than broader character and digital citizenship outcomes. Therefore, this study aims to investigate how IFP-based digital literacy learning strengthens elementary students' discipline, critical thinking, and digital security awareness, thereby contributing to the development of responsible and competent digital citizens.

2. Research Method

This study employed a qualitative descriptive research design to explore the implementation of IFP-based digital literacy in strengthening elementary school students' digital character. The qualitative approach was selected because this study aimed to gain an in-depth understanding of the learning process, student behaviors, and teacher practices during technology-supported learning activities. This study did not focus on measuring the statistical effectiveness of IFP media but on describing how digital literacy was implemented and how it contributed to the development of students' discipline, critical thinking, and digital security awareness.

The research was conducted at Ngulanan 1 Public Elementary School, which had implemented digital learning activities supported by IFP technology in classroom instruction. The participants consisted of fourth-grade students and teachers involved in the digital literacy learning process. Participants were selected using purposive sampling

because they had direct experiences with the implementation of IFP-based digital literacy activities. Teachers provided information regarding learning strategies, teacher roles, and students' behavioral development during digital learning. In contrast, students were observed to identify their interactions with digital technology, information-processing activities, and digital behavior patterns.

Data were collected through classroom observations, semi-structured interviews, and documentation. Classroom observations were conducted during IFP-based digital literacy activities to identify students' engagement, technology use behavior, information exploration processes, and interactions during learning. The observation indicators included students' discipline in using digital devices, participation in accessing and processing digital information, ability to evaluate digital sources, communication ethics during digital activities, and awareness of digital security practices. Semi-structured interviews were conducted with teachers to explore their experiences in implementing digital literacy through IFP media, including teacher strategies, challenges, guidance practices, and perceived changes in students' digital behaviors. Documentation related to learning activities was also collected as supporting evidence to strengthen the interpretation of observation and interview findings.

Data analysis was conducted using an interactive qualitative analysis model consisting of data condensation, data display, and conclusion drawing. The researchers first organized and selected relevant information from observation notes, interview transcripts, and documentation related to the implementation of IFP-based digital literacy. The data were then categorized into several emerging themes: the implementation stages of digital literacy learning, students' digital discipline, the development of critical thinking, digital security awareness, and teacher roles in facilitating digital learning. The final stage involved interpreting patterns and relationships among the identified themes to generate conclusions regarding the contribution of IFP-based digital literacy to students' digital character development.

The credibility of the findings was ensured through data triangulation, comparing information from classroom observations, teacher interviews, and documentation. The consistency of findings across different data sources was examined to strengthen the interpretation of students' behavioral development and teacher practices during digital literacy implementation. Ethical considerations were also applied throughout the research process. Permission was obtained from the school before data collection, participants were informed of the study's purpose, and all collected information was used solely for research purposes while maintaining participants' identities' confidentiality.

3. Results and Discussion

3.1 Results

3.1.1 Implementation of IFP-Based Digital Literacy in Learning

This study explored the implementation of digital literacy through IFP-based learning at Ngulanan 1 Public Elementary School. Observation results showed that digital literacy activities were integrated into classroom learning through the use of IFP as an interactive digital learning medium. The implementation involved students' interaction with digital materials, including educational videos, digital images, online information sources, and interactive learning activities.

Figure 1 illustrates the implementation of IFP-based digital literacy activities in the classroom. Students were observed actively engaging with digital content by

responding to learning materials, presenting ideas, and participating in discussions facilitated through the IFP.

Figure 1. Implementation of Digital Literacy Learning Using IFP Media

The observation findings indicated that IFP facilitated a more interactive learning environment. Students were not only receiving information from teachers but also involved in exploring, discussing, and processing digital information. Teacher interviews supported these observations. One teacher (T2) stated:

> *"Students are more enthusiastic when learning with the IFP because they can directly interact with learning materials and participate actively during discussions."*

The implementation of digital literacy consisted of four main stages: introduction, core activities, mentoring, and reflection. The stages are presented in table 1.

Table 1. Stages of Implementing Digital Literacy in Learning

Learning Stages	Teacher Activities	Student Activities	The Goal of Digital Literacy
Introduction	Explain learning objectives and rules for using digital devices.	Listen to the teacher's instructions and prepare the equipment.	Raising awareness of the wise use of technology.
Core activities	Giving assignments to search for information online and watch educational videos.	Search for information, discuss, and create simple presentations.	Train the ability to access and evaluate information.
Mentoring	Guiding students when using technology.	Ask and discuss the information obtained.	Ask and discuss the information obtained.
Closing	Inviting students to reflect on learning.	Delivering learning experiences.	Raising awareness of digital ethics.

The findings demonstrate that digital literacy implementation was conducted systematically through technology-supported learning activities. The use of IFP provided students with opportunities to access information, communicate ideas, and engage with digital content under teacher guidance.

3.1.2 Strengthening Students' Discipline

Observation and interview data indicated changes in students' digital discipline after participating in IFP-based digital literacy activities. Students gradually demonstrated more responsible behavior in using digital devices, managing learning time, and completing technology-based assignments. Before implementation, students primarily used digital devices for entertainment and required frequent reminders from teachers. After participating in digital literacy activities, students showed increased awareness of device usage rules, including focusing on learning activities and following instructions when interacting with digital media. Table 2 presents observed changes in students' digital behavior.

Table 2. Changes in Student Attitudes and Behavior after Implementation of Digital Literacy

Digital Character Aspects	Before Implementation	After Implementation
Discipline in using devices.	Students often use gadgets for reasons unrelated to learning.	Students follow the rules for device usage time.
Ability to sort information.	Students tend to copy information without understanding the content.	Students begin to compare and understand sources of information.
Digital communication ethics.	Some students use impolite language during discussions.	Students start using more polite language.
Digital security awareness.	Students do not yet understand the importance of protecting personal data.	Students are becoming more careful about sharing personal information.

According to table 2, the most prominent improvement is seen in students' discipline in using digital devices and in their awareness of digital communication ethics. Students who previously used gadgets mainly for entertainment began to follow usage rules and use technology for learning. Another important change is in their ability to evaluate information, as students began comparing sources rather than directly copying content. In addition, awareness of digital security increased, as students became more cautious in sharing personal information. These findings indicate that digital literacy significantly shapes responsible and ethical digital behavior.

The findings indicate that digital literacy activities encouraged students to develop self-regulation when using technology. Students began to recognize that digital devices could support learning activities rather than only entertainment.

3.1.3 Development of Students' Critical Thinking through Digital Literacy

Observation results showed that IFP-based digital literacy activities encouraged students to develop critical thinking behaviors. Students were involved in searching for

information, comparing digital sources, asking questions, and drawing conclusions from the information obtained. The indicators of critical thinking development observed in this study are presented in table 3.

Table 3. Indicators of Students' Critical Thinking Improvement

Indicators	Description of Student Behavior
Identifying information	Students can find relevant information online.
Evaluating sources	Students compare several sources of information.
Asking questions	Students ask questions to verify the accuracy of information.
Drawing conclusions	Students can organize search results into new knowledge.

According to table 3, students demonstrated several indicators of critical thinking development during IFP-based digital literacy activities. The ability to identify information was reflected in students' capacity to select digital content related to the learning topic rather than accepting all information presented online. Furthermore, students began evaluating digital sources by comparing information across different websites and discussing the reliability of the information obtained. The questioning behavior observed during learning activities indicates that students were gradually developing curiosity and analytical awareness. Students not only collected information but also attempted to verify the accuracy and relevance of the digital content. In addition, students were able to organize the information obtained into simple conclusions and present their understanding during classroom discussions.

Students demonstrated a shift from passive information receivers to active learners who interacted with digital information. Teacher guidance was important in helping students evaluate the reliability of digital sources. T3, as a teacher, explained:

> *"Students still need guidance when searching for information online because they often struggle to distinguish reliable and unreliable sources."*

These findings indicate that IFP-based digital literacy activities encouraged students to move from passive information users toward active digital learners. The interactive features of IFP provided opportunities for students to explore, analyze, and communicate information, which are important processes in developing critical thinking skills.

3.1.4 Digital Security Awareness and Teacher-Mediated Digital Character Development

The findings revealed that implementing digital literacy contributed to students' awareness of digital security and responsible technology use. Observation and interview data indicated that students gradually came to understand the importance of protecting personal information, maintaining privacy, and considering the consequences of their actions in digital environments.

Students demonstrated several emerging digital security behaviors, including avoiding the disclosure of personal data, recognizing the importance of password confidentiality, and understanding that not all information obtained from digital platforms should be shared or accepted immediately. These behaviors show that digital literacy activities promoted not only operational skills but also responsible decision-making when

interacting with technology. The development of digital security awareness was closely related to the teacher's role during digital learning activities. Teachers acted as facilitators by providing meaningful digital learning experiences, mentors by guiding students in evaluating online information, supervisors by monitoring technology use, and digital role models by demonstrating ethical digital behavior.

Teacher guidance was particularly important because elementary school students are still developing the ability to recognize digital risks independently. Through continuous interaction and reflection, students were encouraged to understand that technology use requires responsibility, discipline, and awareness of potential risks. Table 4 presents the teacher roles identified during IFP-based digital literacy implementation.

Table 4. The Role of Teachers in Implementing Digital Literacy

Teacher Role	Observed Activities	Contribution to Digital Character
Facilitator	Providing IFP-based learning resources.	Encouraging active digital learning.
Mentor	Guiding students in searching and evaluating information.	Developing responsible information use.
Supervisor	Monitoring digital device usage.	Preventing inappropriate technology behavior.
Digital role model	Demonstrating ethical communication.	Building positive digital habits.

The findings indicate that teacher involvement functions as an important mechanism connecting technology integration and students' digital character development. The presence of teachers ensures that digital technology is not merely used as a learning tool but becomes a medium for developing responsible, ethical, and safe digital behaviors.

3.2 Discussion

The findings of this study indicate that IFP-based digital literacy serves as a learning approach that supports the development of students' digital character, particularly in digital discipline, critical thinking, and digital security awareness. The findings strengthen the view that digital literacy should not be understood merely as the ability to operate digital devices, but as a multidimensional competence encompassing cognitive, technical, social, and ethical aspects. Digital competence frameworks emphasize that responsible technology use requires individuals to access information, evaluate digital content, communicate appropriately, and manage risks in digital environments (Spante, Hashemi, Lundin, & Algers, 2018; Vuorikari, Kluzer, & Punie, 2022). Furthermore, digital literacy has increasingly been recognized as a multidimensional competence encompassing technical abilities, critical thinking, and socio-emotional awareness in interactions with technology (Erdat, Ceren, Ozdemir, Sahan, & Bilgin, 2023; Zhao, Llorente, & Gómez, 2021). Therefore, this study extends previous perspectives by demonstrating how IFP-mediated digital literacy can foster a context for developing digital competence among elementary school students.

The implementation of IFP-based learning in this study created an interactive learning environment that encouraged students to engage actively with digital content.

Students were involved in exploring information, discussing digital materials, and presenting their understanding through interactive media. This finding supports previous research indicating that interactive technologies can increase student engagement by providing opportunities for active participation, collaboration, and meaningful interaction with learning resources (Getenet & Tualaulelei, 2023; Yang & Baldwin, 2020). In addition, interactive display technologies require careful pedagogical design because the effectiveness of digital media depends not only on the availability of technology but also on how teachers organize learning experiences (Müller, Otero, & Milrad, 2024). The present study confirms that IFP serves not merely as a presentation tool but as an interactive learning environment that enables students to construct knowledge through exploration and communication. This finding is consistent with the argument that technology-supported learning becomes meaningful when integrated with appropriate instructional strategies and learning objectives (Falloon, 2020; Saili, Taat, & Japilan, 2024).

The development of students' digital discipline suggests that implementing digital literacy can foster responsible technology habits. In this study, students gradually demonstrated greater awareness of device-use rules, greater responsibility, and appropriate technology use. This finding suggests that digital literacy involves behavioral regulation and ethical decision-making, not only the ability to operate digital devices. Digital competence frameworks emphasize that responsible digital behavior requires integrating knowledge, skills, attitudes, and values in technology use (Vuorikari, Kluzer, & Punie, 2022; Zhao, Llorente, & Gómez, 2021). Previous research also highlights that digital literacy education at the elementary level plays an important role in developing students' character and responsible participation in digital environments (Nur, 2025; Tauhid, 2025). Furthermore, digital citizenship research indicates that young learners need structured opportunities to practice responsible technology use, as digital behavior is shaped through continuous experiences and social interactions (Jones & Mitchell, 2016). Therefore, the digital discipline observed in this study can be interpreted as an early manifestation of students' development of digital citizenship.

The improvement of students' critical thinking was reflected in their ability to identify, evaluate, question, and synthesize information obtained from digital sources. The findings indicate that IFP-based digital literacy encouraged students to move beyond simply receiving information toward actively examining and interpreting digital content. This process is an important component of digital literacy because learners must be able to determine the relevance of information, evaluate credibility, and make decisions based on available evidence (Spante, Hashemi, Lundin, & Algers, 2018; Tinmaz, Ivanovici, & Baber, 2023). Previous studies have also emphasized that digital competence is closely related to higher-order thinking because digital environments provide abundant information that requires critical evaluation (Zhao, Llorente, & Gómez, 2021). In addition, exploratory learning approaches argue that students develop a deeper understanding when they engage in searching, analyzing, and constructing knowledge rather than memorizing information (Gumilar, 2025). Thus, this study demonstrates that IFP-based digital literacy can provide a learning environment that supports the development of critical digital thinking among elementary students.

The findings regarding digital security awareness show that digital literacy activities helped students begin to recognize the importance of privacy protection, responsible online behavior, and awareness of digital risks. Students' understanding of personal data protection emerged through teacher-guided activities related to safe

technology use. This finding supports previous research emphasizing that children's digital interactions require early education on privacy and security, as students may not fully understand the consequences of sharing information in digital spaces (Akman, İdil, & Çakır, 2023; Livingstone, Stoilova, & Nandagiri, 2019). Furthermore, cybersecurity responsibility involves not only technical knowledge but also awareness, attitudes, and behavioral practices that support safe participation in digital environments (Panteli, Nthubu, & Mersinas, 2025). Research on digital literacy in education also indicates that students' ability to navigate digital environments safely is influenced by both cognitive understanding and social guidance from adults (Erdat, Ceren, Ozdemir, Sahan, & Bilgin, 2023). Therefore, the digital security awareness developed in this study demonstrates that classroom-based digital literacy can serve as a preventive strategy to prepare students to interact safely with digital technology.

Teacher involvement was identified as an important mechanism that supported the effectiveness of IFP-based digital literacy implementation. Teachers in this study served as facilitators, mentors, supervisors, and digital role models, guiding students in accessing information, evaluating digital resources, and practicing ethical technology use. This finding strengthens the view that technology integration is not determined only by the availability of digital tools but also by teachers' pedagogical competence in designing meaningful learning experiences (Falloon, 2020; Saili, Taat, & Japilan, 2024). Previous studies also indicate that teacher guidance is essential in digital literacy programs, as students need support in interpreting information and managing technology use responsibly (Nurjanah, Bedi, Tin, & Fitri, 2024; Tahir, Aswan, & Makbul, 2024). In the context of elementary education, teachers function as mediators who transform digital technology from a simple learning tool into a medium for developing character values such as responsibility, discipline, and ethical awareness (Annur, Susanti, & Gera, 2023; Nugroho, Istiqomah, Yanti, Prayogi, Safira, & Sagala, 2025). Thus, the findings emphasize that the success of IFP-based digital literacy depends on the interaction between technological infrastructure and teacher-mediated learning practices.

Overall, this study contributes to the literature by positioning IFP-based digital literacy as a pedagogical approach that integrates technological competence with the development of digital character. Previous studies have mainly discussed digital literacy in relation to technology skills, information access, or learning engagement (Devi & Winangun, 2024; Spante, Hashemi, Lundin, & Algers, 2018; Zhao, Llorente, & Gómez, 2021). However, this study highlights that interactive digital learning environments can simultaneously support students' cognitive development, responsible behavior, and digital safety awareness. This contribution is important because elementary education increasingly requires students to become not only competent technology users but also critical, ethical, and responsible digital citizens (Jones & Mitchell, 2016; Panteli, Nthubu, & Mersinas, 2025; Vuorikari, Kluzer, & Punie, 2022). Therefore, integrating digital literacy through interactive technologies such as IFP represents a strategic pathway for preparing young learners to participate safely and meaningfully in digital society.

The findings of this study have several implications for implementing digital literacy in elementary education. From a practical perspective, this study suggests that schools should not consider digital technology merely as a learning tool but as a medium for developing students' digital character. The integration of IFP should be accompanied by structured learning activities, teacher guidance, and digital ethics education to ensure that technology use supports responsible and meaningful learning experiences. Teachers are encouraged to strengthen their digital pedagogical competence so that interactive

technologies can be used to facilitate information evaluation, collaboration, and the development of critical thinking. From a theoretical perspective, this study expands the understanding of digital literacy by emphasizing that digital competence development involves not only technical abilities but also behavioral, ethical, and security dimensions. The findings support the view of digital literacy as a multidimensional construct that integrates cognitive skills, social responsibility, and safe technology practices. Therefore, IFP-based digital literacy can serve as a potential framework for fostering digital citizenship among elementary school students.

This study has several limitations that should be considered. First, the research was conducted in only one elementary school; therefore, the findings should be interpreted within the specific educational context and cannot be generalized broadly. Second, the implementation period was relatively short, meaning that long-term changes in students' digital character development require further investigation. Third, this study relied primarily on observation and teacher interviews, which may not fully capture students' internal perceptions and experiences. Future research is recommended to involve multiple schools, longer implementation periods, and mixed-method approaches combining qualitative and quantitative measurements to examine the sustainability and broader impact of IFP-based digital literacy implementation.

4. Conclusion

This study concludes that implementing IFP-based digital literacy strengthens elementary school students' digital character by developing discipline, critical thinking, and digital security awareness. The findings indicate that IFP creates an interactive learning environment that encourages students to actively access, evaluate, and communicate digital information. The structured implementation of digital literacy through introduction, exploration, mentoring, and reflection activities enables students to develop responsible technology-use behaviors. Furthermore, students demonstrated increased awareness of digital ethics, information evaluation, collaboration, and personal data protection. The findings also highlight the essential role of teachers as facilitators, mentors, supervisors, and digital role models in guiding students' digital experiences. Therefore, IFP-based digital literacy should be systematically integrated into elementary education as an approach to develop not only technological competence but also critical, ethical, and responsible digital citizens. Future studies are recommended to involve broader contexts and longitudinal designs to examine the sustainability of digital character development.

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