Vol. 26, No. 2, 2025, 101 – 111
JURNAL PENDIDIKAN
journal homepage: http://jurnal.ut.ac.id/index.php/jp
ISSN 2443-3586

Secondary School Teachers' Perceptions and Intentions to Promote Digital Ethics Literacy into Classroom Practice

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Article Info

Keywords:
digital ethics literacy
digital citizenship
teachers' intention

Article History:
Received: July 30, 2025
Accepted: September 25, 2025
Publish: September 29, 2025

DOI:
10.33830/jp.v26i2.13115.2025

Abstract

As teachers and students are increasingly exposed to potential online risks, such as data and privacy threats, they requires digitally literate educators to guide students safely and ethically. This study explores secondary school teachers' perceptions and intentions to integrate digital ethics literacy, such as online safety and data privacy, into their teaching. Using a mixed-methods approach, we invited 30 Indonesian junior and senior high school teachers to participate in a survey, and 17 participants returned data, of whom five were selected for semi-structured interviews to capture a more comprehensive understanding. The survey data were analyzed using descriptive statistics, while thematic analysis was conducted to generate codes and themes in the interview transcripts. Findings indicate that: (1) teachers highlighted the importance of digital ethics literacy and the need for ongoing professional development; (2) teachers expressed interest in integrating digital ethics literacy into their classrooms; (3) while the majority of teachers had some knowledge of digital ethics literacy, many still lacked confidence and consistency in applying key practices, due to the curriculum gaps, varying digital literacy levels, and limited institutional support. The findings of this study carry several implications for teacher training, curriculum development, and institutional policy.

INTRODUCTION

We now educate and learn in a highly automated and digitally driven environment. The use of Information and Communication Technologies (ICT) in education has become an inevitable necessity to support learning and teaching processes (Schulz, 2023; Gupta et al., 2021; Llamas et al., 2025; Oumelaid et al., 2025) sustaining school practices during unprecedented times (Thaheem et al., 2021), as well as fostering inclusive learning environments (Mavrou & Loizou-Raouna, 2017). While we enjoy so many benefits from integrating ICT in education, students are increasingly exposed to online risks related to privacy, security, and digital footprints (Martin et al., 2020). Blackmon (2023) suggests that in many cases, students' interactions with technology are often not by their own choice, but

rather due to their status as students and their relationship with the educational institution. Livingstone & Helsper (2010) also point out that students' growing digital engagement tends to increase their vulnerability to various online threats. A joint study by the Indonesian Ministry of Women Empowerment and Child Protection, UNICEF, and local organizations found that approximately 30.8% of children interacted online with strangers (Muller et al., 2023).

In a study of 400 Indonesian children and teens aged 10 to 19 across 12 provinces, Gayatri et al. (2015) found that over half of the participants (50.6%) had shared details about their school contacts, and nearly one in five (17.9%) had shared personal details about their families. The prevalence of oversharing personal information online exposes Indonesians to risks in the digital space, such as malware and cybercrime (Zahra, 2023). Therefore, building safe, inclusive, and equitable learning environments requires more than simply providing technological access, it requires digitally literate educators to guide students ethically. In doing so, Kim et al. (2021) suggest that supporting digital inclusion in schools also involves promoting digital literacy among teachers.

Digital ethics as a part of digital literacy education can be an approach to answer these digital challenges. Digital literacy is not just about operating devices or applications, but also about using them responsibly and ethically to ensure a positive engagement in online settings (Falloon, 2020; Desniyanti, 2025). Teachers are expected to do more than incorporate digital tools into learning, as they must also ensure that future generations develop competencies to safely engage in the digital environment (Kaya & Köseoğlu, 2024; Isdendi et al. 2023) argue that educating people to perform responsible actions contributes to establishing a safe, inclusive, and accountable online environment. Nottingham et al. (2022) point out that the ability of teachers to manage and protect students' personal data is very important as schools often record students' sensitive information, such as attendance records, health conditions, notes on personal difficulties and family circumstances.

In this sense, teachers' understanding of digital ethics literacy is not only about instructional content, but also directly relates to the protecting students' rights and safety. Furthermore, there is a need to investigate the teacher's perspective, considering educators' pivotal role in supporting a safe and ethical digital learning environment. Understanding how teachers view technology use in education can shed light on practical challenges and how these views shape their instructional choices (Ventouris et al., 2021; Akram et al., 2022). As Ertmer et al. (2012) suggest that teachers' existing attitudes and beliefs toward technology serve as the primary challenges to its adoption.

Studies on digital ethics literacy in the Indonesian context still focus on students' perspectives (Pramanda et al., 2018; Terttiaavini & Saputra, 2022; Harmawati et al., 2023). Thus, this study aims to explore Indonesian secondary school teachers' perception and intention to integrate digital ethics literacy into their teaching, while also identifying the challenges involved. It addresses the following questions: How do teachers perceive the importance of digital ethics literacy (e.g., online safety, data privacy) in education? What factors limit their intention to integrate digital ethics literacy in their teaching?

This study was grounded in the Theory of Planned Behavior (Ajzen, 1991). The TPB consists of three constructs (attitude toward the behavior, subjective norm, perceived behavioral control) to predict intention. In this study, attitude toward the behavior refers to the extent to which teachers have a positive or negative evaluation of digital ethics literacy and its integration into teaching. Subjective norm refers to the perceived social pressure experienced by teachers to integrate or not to integrate digital ethics literacy into teaching. Perceived behavioral control refers to the extent to which teachers feel it is easy or difficult to integrate digital ethics literacy into teaching. These TPB' constructs were used to inform the research instruments' design, the qualitative data coding, and the findings' interpretation.

As this study draws on primary data from secondary school teachers, it offers practical insights into real-world contexts. It also contributes to the broader discussion on digital ethics literacy by providing a detailed understanding of secondary school teachers' perceptions on the importance of digital ethics literacy, their intentions to integrate it into their teaching, and the challenges they encounter.

RESEARCH METHODS

This study employed a mixed-methods approach, combining both quantitative and qualitative approaches. Creswell (1999) describes a mixed-method study as one that merges qualitative and quantitative methodologies for collecting and analyzing data in a single study. Clark et al. (2021) highlight that a mixed-method approach enriches the research process, as it enables findings to validate one another to provide a more comprehensive answer to research problems. Quantitative data were collected using a self-administered questionnaire based on the TPB constructs, while qualitative data were obtained through semi-structured interviews with open-ended questions aligned to the same framework.

Using a sequential explanatory design, this study consisted of two stages. First, we invited 30 Indonesian junior and senior high school teachers who joined the Digital Literacy Training by one of the Indonesian Online Learning Platforms last February 2025, to participate in the study through a survey to identify participants' general understanding and perception. Then, 17 participants agreed to participate and returned complete responses Table 1. From these, 5 teachers were selected for semi-structured interviews Table 2 using maximum variation sampling to capture a broad range of experiences based on years of teaching, school type, and level of digital exposure.

Table 1. Survey Participants

School Level	Frequency	Percentage
Junior High School Teachers	5	29,4%
Senior High School Teachers	2	11,8%
Vocational High School Teachers	7	41,1%
Other (equivalent to secondary school teachers)	3	17,7%
Total	**17**	**100%**

Table 2. Interview Participants

Participant	Gender	Teacher at
Teacher 1 (T1)	Female	Vocational High School
Teacher 2 (T2)	Male	Vocational High School
Teacher 3 (T3)	Female	Junior High School
Teacher 4 (T4)	Male	Junior High School
Teacher 5 (T5)	Female	Vocational High School
Total		**5**

This study adhered to the Swedish Research Council's Good Research Practice (Vetenskapsrådets, 2017). Therefore, at each stage, all participants were provided with an informed consent form explaining the study's aims, their rights, confidentiality, and the voluntary nature of participation. All information was confidential and proceeded anonymously so that no individual (or associated organization) was identified in any

publication of the results. All participants provided their consent and agreed to participate after receiving full information about this study.

The quantitative data were entered into a spreadsheet and analyzed using descriptive statistics, where frequency counts and percentages were used to summarize responses. The interview transcripts were analyzed using thematic analysis, following Braun and Clarke's (2006) six-step method, which consisted of data familiarization, initial coding, generating themes, reviewing themes, defining and naming themes, and producing the report.

RESULTS AND DISCUSSION

Teachers' perceptions of the importance of digital ethics literacy in education

Recognition of Importance

The findings show that teachers strongly value digital ethics literacy, recognizing its importance for both their professional integrity and students' well-being Table 3.

Table 3. Teachers' Perceptions of Digital Ethics Literacy

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)
I understand that careless digital behavior can harm my reputation as an educator and harm my professional relationships with students or colleagues.	9 (53%)	7 (41%)	1 (6%)	0	0
I realize that not educating students about digital safety and ethics can make them vulnerable to dangers such as cyberbullying or online scams.	7 (41%)	9 (53%)	1 (6%)	0	0

Many teachers recognized that careless digital behavior could damage their professional reputation and relationships with students or colleagues. This result is consistent with prior research, where Nursida et al. (2025) also reported that teachers demonstrated ethical awareness by recognizing the importance of digital ethics, particularly concerning appropriate communication and professional responsibility. Teachers also underscored the usefulness of digital ethics literacy for students, stressing that students without digital ethics literacy are more vulnerable to risks such as cyberbullying and online scams. Similarly, previous researchers such as Martin et al. (2022) also suggest that teachers are concerned about their student's digital safety as they are aware that school children are spending more time using digital technologies.

This finding was further explored through the interviews, showing that teachers' acknowledgments were rooted in everyday realities, ranging from personal concerns about their digital footprint and safety to concerning issues affecting their families and students. When asked, *"How important is privacy and data protection to you, especially as an educator?"*, T1 answered:

"It is very important because any leaks could cause significant losses, both for us

[teachers] and sometimes adversely affect the students."

T4 stated,

> "It is extremely important because our privacy can be misused by certain parties, whether through phishing or misuse of our data. This does not just endanger ourselves but also our loved ones, like family members."

T5 shared a similar opinion based on personal experience:

> "In my view, it is extremely important. I have personally experienced fraud where my phone number was used, and I have received parcels I did not order…"

Positive Attitudes Toward Integration

The survey findings also reveal that teachers expressed positive perceptions regarding the integration of digital ethics literacy in teaching-learning practices. 100% of respondents (17 total responses) agreed or strongly agreed that students should receive education on digital literacy at school, including digital ethics literacy, digital safety, and digital culture (see Figure 1).

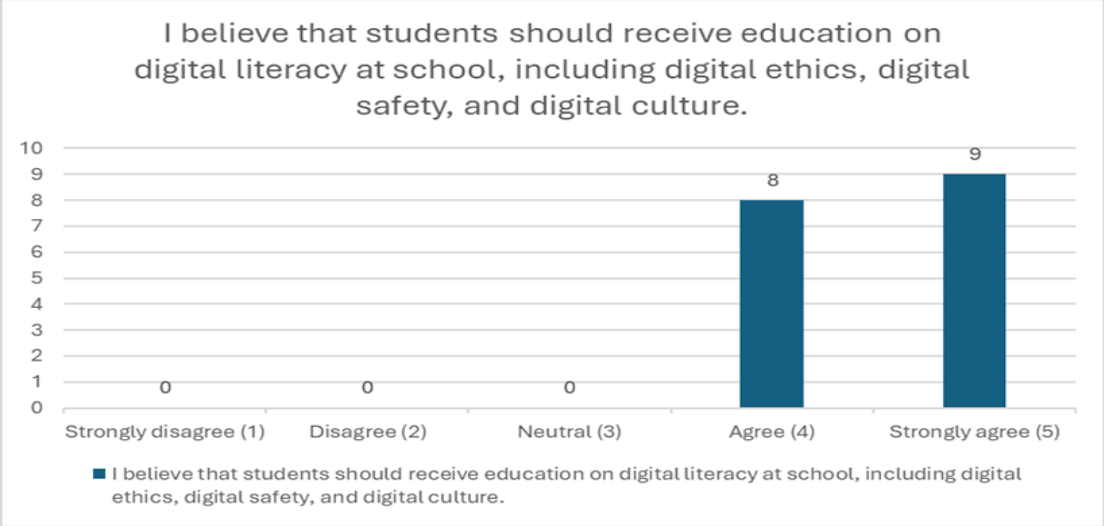

Figure 1. Teachers' perceptions of integrating digital ethics literacy into teaching

In the interview, teachers also expressed a strong interest in integrating digital ethics literacy into their classrooms. T1 stated:

> "Yes, it [digital ethics literacy] is integrated into my teaching. For example, when using WhatsApp, I inform them [students] that they should examine the message [they receive], avoid clicking on any links immediately, and ensure they know who sent it."

T4 adopted an approach based on the principle of leading by example:

> "I set an example by filtering things [content] before uploading them on my social media platforms, especially on Instagram, where more than half of my followers are my students. I try to minimize sharing private information like daily activities or [content about] vacations and instead focus on posting beneficial content, such as educational materials or life lessons."

This collective endorsement suggests that teachers not only perceive digital ethics literacy as important but also experience positive emotions, such as motivation, toward integrating it into their teaching. According to the TPB (Ajzen, 1991) favorable attitudes play a significant role in shaping intentions. This is reflected in the teachers' responses, indicating that the more positive their attitudes, the stronger their intention to integrate digital ethics literacy into their teaching. Therefore, if school leaders and policymakers seek to formulate

policies in this area, their implementation is likely more effective, as it is supported by teachers' genuine awareness and intentions. Also, professional development programs can build on this motivation by offering practical resources and strategies, ensuring that favorable perceptions translate into sustained classroom practice.

Factors Inhibiting Teachers' Intention to Integrate Digital Ethics Literacy

Despite positive attitudes, teachers' intention to integrate digital ethics literacy are constrained by several factors below.

Curriculum Gaps

Teachers reported a lack of formal expectations from their institutions. All interview participants acknowledged that this topic has not yet been integrated into the school curriculum, and there are no school guidelines requiring them to teach it. T5 highlighted:

> "It is not included in the school's curriculum. Not that I am aware of, though perhaps it is covered in computer networking courses. In the subjects I teach, it is definitely not included."

T1 suggested: "I hope they embed it into the curriculum and provide specific training for protecting our personal data, not just for teachers but for students too."

The absence of curriculum integration and school guidelines means there is little pressure from school leaders and policymakers. Similarly, teachers also indicated that peer expectations were also low as the digital ethics literacy integration was uncommon and not many colleagues have already done it, so the encouragement is weak.

In this sense, teachers did not experience social pressure from any party, including colleagues or their institutions. Yet, previous studies have shown that institutional expectations and peer practices play an important role in influencing teachers' adoption of new innovations (McCornell et al., 2020; Bakhadirov et al., 2024). Referring back to the TPB framework, this finding indicates that subjective norm (institutional or colleagues' pressures) is not a strong determinant, as it seems to play a little role in shaping teachers' intentions to integrate digital ethics in their teaching practices.

Interestingly, despite weak social pressures, teachers described a strong internal sense of accountability, as they expressed personal motivation and a clear sense of calling to teach digital ethics literacy, despite the absence of formal requirements. For example, when asked, *"What motivates you to teach these topics to your students, even though the school does not require it?"* T1 responded,

> "It is because of the current risks, especially with so many victims through apps. I teach them [students] to prevent them from becoming victims. It is better to be safe than sorry, considering the dangers of online transactions."

Therefore, if policymakers and school leaders intervene to strengthen the subjective norm aspects by embedding the material into the curriculum and formalizing it within instructional responsibilities, it is more likely to enhance the overall effectiveness of integrating this topic in the classroom. Capulso (2023) suggests that teachers' motivation and work ethics are critical to effective and efficient teaching and learning processes.

Gaps in confidence, diverse levels of digital ethics literacy, and institutional support

While teachers acknowledge the importance of digital ethics literacy and express their intentions to teach it, many still lack confidence and consistency in applying key practices. McLeod & Carabott (2016) highlight that when educators are not confident in teaching digital literacy, the next generation is less likely to become digitally competent. This means that if teachers are not equipped, students may miss out on learning the digital skills and ethical awareness they need.

In the interview, T1 admitted:

> "I would not say I am hundred percent confident because my knowledge is still limited, especially regarding digital data protection."

T3 expressed a similar sentiment:

> "Honestly, I do not feel I have enough knowledge yet. I realize that I sometimes violate privacy itself. For example, I have occasionally posted pictures of my students online without getting permission from their parents. That shows me that I still have a lot to learn about this topic."

The interview also shows that teachers possess some knowledge of digital ethics literacy, but at different levels. T4 noted:

> "I think it varies. Some [teachers] may see sharing their full name as normal, while others may consider using just their nickname is enough. There are also those who see sharing their home address or phone number as normal, while others consider these too private. Therefore, every teacher has a different standard regarding what information should be shared."

T2 argued:

> "Not all teachers are equally aware, some may only be ten or twenty percent aware, while others are much more conscious of it. To close that gap, those of us who understand the importance of privacy must take the initiative to raise awareness among our colleagues."

Teachers demonstrated varying levels of digital ethics literacy, where teachers hold different views, for example, about what counts as appropriate information to share online and inconsistent practices of digital ethics. This disparity in knowledge and practice echoes findings from earlier studies, which similarly found that teachers' levels of digital ethics literacy are uneven (Atmojo et al., 2021; Suzer & Koc, 2024).

Furthermore, all teachers in the interview reported that they had never received any training or professional development programs related to digital ethics literacy from the schools where they are employed, highlighting a significant institutional constraint. T2 noted:

> "There has not been any specific training focused solely on privacy or digital safety. That said, most of the initiatives around privacy have been self-directed. For instance, I once took part in a data security training organized by the Ministry of Communication and Information. I joined it independently."

T3 also highlighted:

> "At the moment, no, we do not have anything [training] like that. We have regular training, but the focus is more on technology itself, like how to create accounts or use digital tools. It has not extended into privacy or data protection topics yet."

Without institutional support such as structured training opportunities or accessible resources, even motivated teachers may struggle to integrate these topics effectively and consistently. These factors are linked to the TPB's construct of perceived behavioral control, as teachers perceived that such challenges affected their intention to incorporate digital ethics into their teaching. Liu et al. (2017) suggest that teachers' perceptions of school support for technology integration affect their confidence in using technology in the classroom.

Thus, in this case, institutional support is essential if school leaders or policymakers aim to encourage teachers to integrate digital ethics literacy into their teaching, as it can strengthen their motivation and reduce the barriers they face. Håkansson Lindqvist and Pettersson (2019) stress that school leadership is key in driving digital initiatives through sustained support for both students and teaching staff. Dexter (2008) emphasizes that when school leaders

understand and support teachers' digital skills, it creates a solid basis for enhancing student outcomes. Ultimately, a school's overall development is strongly affected by the leadership's commitment to and strategy for digital innovation.

Therefore, during the interviews, teachers emphasized the need to enhance their digital ethics literacy through targeted professional development opportunities, such as focused training sessions. T5 suggested:

> "I would like to propose to the school that we run training sessions on privacy and data protection related to social media. Hopefully, they [school leaders] will listen, approve the idea, and we can start putting it into practice."

T4 proposed a more comprehensive approach to the teacher development program, stating that:

> "As a teacher, I suggest schools or the relevant ministry facilitate us with webinars, guidance sessions, or technical support on effective ways to advocate for this topic in class. Scheduled sessions outside regular school hours or integrated into existing subjects would be beneficial."

Previous scholars have also highlighted the benefits of teacher development programs in supporting teachers' digital ethics literacy. Teachers can support the digital safety of their students by developing their own professional knowledge of digital safety (Martin et al., 2022; Oanh 2025) asserts that such in-depth training will enhance teachers' understanding of online risks and equip them with effective methods to guide students in developing responsible online behavior. Beyond targeted training, Paskevicius (2021) emphasizes that preparing future teachers to use digital tools effectively requires continuous professional development, especially in technical skills and pedagogical methods (Limbong & Wadham, 2024). In order to strengthen teachers' competencies in digital ethics literacy, policymakers, educational leaders, and private sector actors could consider these factors when planning, designing, and executing professional development initiatives to ensure the training is relevant, well-targeted, and responsive to teachers' needs.

CONCLUSION

In summary, while teachers perceive digital ethics literacy as highly important for both professional responsibility and student learning, demonstrating strong positive attitudes and intentions to integrate it into their teaching, many lack the confidence to apply these concepts effectively. This hesitation is largely attributed to insufficient knowledge and a lack of targeted professional development opportunities. Furthermore, the study highlights systemic challenges, such as limited institutional support and curriculum gaps, which further hinder teachers' efforts to promote digital ethics literacy in the classroom. Framed through the TPB, these findings underscore the need to align favorable attitudes with subjective norms and enhanced behavioral control to ensure digital ethics literacy becomes an integral part of secondary education. The study offers valuable real-world insights by directly drawing on secondary educators' primary data. However, the relatively small sample size poses limitations regarding the generalizability of the findings. Future research should consider expanding the participant pool and exploring digital ethics literacy across different educational levels to better understand and inform broader policy and training initiatives.

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