



Teacher Professional Ethics in Addressing Moral Challenges in the Era of the Industrial Revolution 4.0

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ABSTRACT

This study examines the implementation of teachers' professional ethics in responding to moral challenges arising in the Industrial Revolution 4.0 era, particularly with respect to integrity, responsibility, and digital ethics in primary education. Using a descriptive qualitative approach and a systematic literature review, this study synthesizes scholarly sources on ethical practices and digital moral issues in schools. The findings show that teachers have employed several strategies, including enhancing digital ethics literacy, integrating character values into technology-based learning, developing professional learning communities, and collaborating with schools and families. However, these strategies remain limited by uneven digital competence and insufficient institutional support for ethical supervision. The novelty of this study lies in its focus on how digital moral challenges redefine the ethical responsibilities of primary school teachers, emphasizing that ethical professionalism in the digital era requires context-sensitive decision-making rather than merely adhering to normative codes. In practice, the study highlights the need for primary school teachers to enhance competencies in digital ethics, online classroom management, and student data protection. Theoretically, this study contributes to the development of a digital-integrative model of teacher ethics that connects ethical principles with real digital challenges in primary education. Future research is encouraged to employ mixed methods to gain broader insights.

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1. INTRODUCTION

The rapid advancement of technologies in the 4.0 Industrial Revolution has reshaped the landscape of primary education. Digital tools such as smartphones, online learning platforms, social media, and artificial intelligence increasingly influence how children interact, communicate, and access information (Barua et al., 2022; Alrusaini & Beyari, 2022). For elementary school students, these changes occur during a formative stage of psychological and moral development, making them more vulnerable to the ethical implications of digital engagement (Harrison & Polizzi, 2022; Kaimara et al., 2022). While digital learning offers opportunities for enriched learning experiences, it also presents ethical dilemmas that must be anticipated and addressed through strong professional ethics among teachers.

In the daily realities of primary schools, various moral challenges have emerged in digital spaces (Zvereva, 2023; Dennis & Harrison, 2021). Students often display impulsive communication in class WhatsApp groups, imitate negative content from social media, or engage in early forms of cyberbullying, such as mocking peers through voice notes, stickers, or edited images (Anyanwu & Egbule, 2025). Some students also struggle to distinguish factual from misleading information and are easily misled by hoaxes encountered on YouTube or TikTok. These phenomena illustrate that digital behavior is beginning to influence students' offline moral attitudes, including reduced empathy, disrespectful communication, and weakened self-control.

The presence of such digital moral challenges demands deeper reflection on teachers' ethical responsibilities. However, most existing studies on teacher professionalism emphasize technical skills such as ICT mastery, the creation of digital media, and the integration of online platforms into learning (Fernández-Batanero et al., 2022). While these competencies are essential, they do not sufficiently address the ethical complexities teachers face when guiding students in navigating morally ambiguous digital environments (Salim et al., 2024; Zawawi et al., 2024). As a result, discussions about teacher ethics often remain normative and disconnected from real digital issues encountered in primary school settings.

This gap (research gap) highlights a significant need: the ethical dimension of teaching must be redefined in accordance with the moral risks brought about by digital culture among SD students. Teachers are no longer solely responsible for delivering academic content; they must also act as digital mentors who guide, supervise, and correct students' online behavior (Prasetiyo et al., 2023; Dorner et al., 2022). Issues such as privacy violations, exposure to inappropriate content, online aggression, and excessive screen time require teachers to apply ethical judgment that goes beyond conventional codes of conduct.

In this context, understanding how teachers implement professional ethics significantly contributes to strengthening the moral foundation of primary education. Ethical decision-making, moral sensitivity, and the integration of character values into technology-supported learning must be recognized as core competencies for teachers (Tafazoli, 2025). This perspective aligns with the reality that children at the primary school level are in the early stages of forming digital habits that may persist into adolescence and adulthood, underscoring the crucial role of teachers in shaping safe, responsible, and ethical use of technology.

In light of this problem, the present study aims to analyze the implementation of teachers' professional ethics in addressing digital moral challenges faced by primary school students. The objectives include identifying common moral issues arising in digital interactions among SD students, examining teachers' ethical responsibilities in dealing with these challenges, and

exploring strategies to strengthen ethical professionalism in technology-based learning environments. These objectives emphasize that ethical readiness must accompany digital readiness in primary education.

By focusing on the specific context of elementary schools, this study contributes to expanding the discourse on teacher ethics toward a digital-integrative model. The findings are expected to provide scientific insights and practical recommendations for teachers, schools, and policymakers to build ethical digital learning ecosystems. Ultimately, strengthening teacher professional ethics in the digital era is essential to protect young learners and ensure that technological development remains aligned with the moral values foundational to primary education.

2. METHODS

This study adopts a descriptive qualitative design with a literature review approach to analyze teacher professional ethics in responding to digital moral challenges faced by primary school students. Data were collected from scientific books, accredited journal articles, policy documents, and institutional reports sourced through Google Scholar, ResearchGate, Portal Garuda, and DOAJ. The sources were selected based on relevance, credibility, and recency to ensure the literature reflects current ethical dynamics in elementary education.

The data analysis process employs qualitative content analysis combined with inductive thematic analysis. Content analysis was used to interpret conceptual patterns related to teacher ethics, while inductive thematic analysis allowed themes to emerge naturally from the reviewed literature. Through this process, key themes such as digital moral issues among SD students, teachers' ethical responsibilities, and strategies for strengthening digital ethics were systematically identified and refined.

To maintain research credibility, several validation strategies were implemented. Source triangulation was conducted by comparing findings from conceptual, empirical, and policy-based literature. An audit trail was maintained to document search procedures, selection criteria, coding steps, and synthesis decisions. Additionally, peer debriefing with academic colleagues was used to ensure interpretative accuracy and minimize researcher bias. These steps ensure that the study's conclusions are trustworthy, transparent, and grounded in robust evidence.

3. RESULTS AND DISCUSSION

3.1. Transformation of Teacher Roles in Primary Schools

The findings indicate that primary school teachers experience a significant shift in professional roles in the digital era. Traditionally positioned as content transmitters, teachers now serve as moral facilitators who must guide students in navigating online behavior. The introduction of digital devices into classrooms demands that teachers not only deliver instructional material but also cultivate ethical digital habits among young learners. This new responsibility arises because SD students are in early developmental stages, during which moral reasoning and self-regulation remain limited.

The study further reveals that teachers often struggle to balance technical and ethical demands. While many teachers have received training in digital platforms, their ability to apply ethical decision-making in online contexts remains uneven. Teachers report difficulties

addressing issues such as students sending inappropriate stickers or voice notes, or accessing non-educational content during school hours. These challenges suggest that digital literacy alone is insufficient; it requires strong ethical competence adapted to the developmental needs of SD students.

Another important finding is the inconsistency of school-level digital ethics policies. Some schools have operational guidelines that regulate students' online interactions, whereas others rely solely on informal teacher judgment. As a result, ethical supervision varies significantly across institutions. This inconsistency creates uncertainty for teachers and can reduce the effectiveness of digital moral guidance. Therefore, the changing role of the SD teacher requires not only individual competence but also systemic policy support.

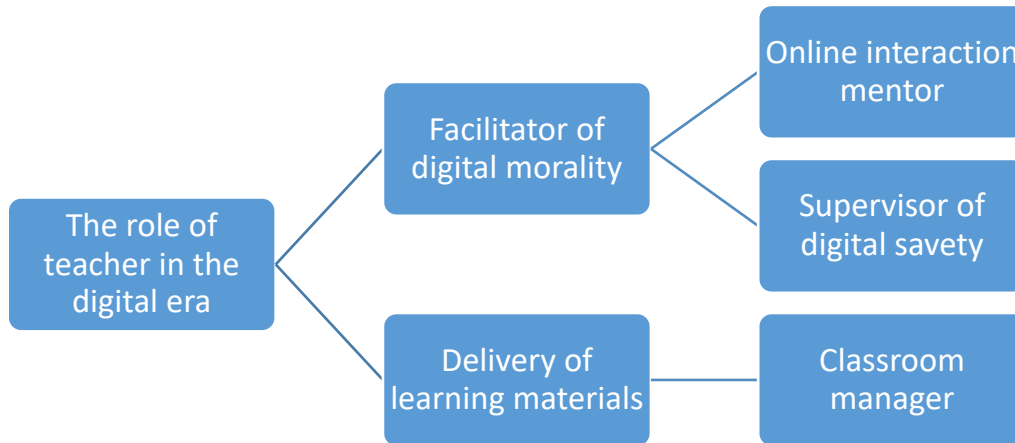


Figure 1. The Transformation of Elementary School Teachers' Roles in the Digital Age

3.2. Digital Moral Challenges Among Primary School Students

The study identifies several recurring digital moral challenges experienced by SD students. These include impulsive communication in class WhatsApp groups, early-stage cyberbullying through stickers and edited images, and inappropriate browsing during lessons. Such behaviors indicate that students often lack the capacity to distinguish between harmless digital play and harmful actions. Their immaturity in emotional regulation makes them vulnerable to conflicts amplified by digital media.

Another key finding is that SD students tend to imitate digital behaviors from social media without understanding the moral implications. Children frequently copy slang, jokes, or expressions from YouTube, TikTok, and gaming communities. This imitation often spills into the classroom, affecting peer relationships and communication styles. The ease of access to content, even when unintended by teachers, makes moral copying one of the strongest influences on students' character formation.

The results also show students' difficulty in distinguishing factual information from hoaxes. In several cases reviewed, SD students confidently repeated misinformation they had heard via social media or children's YouTube channels. This vulnerability places teachers in the position of digital fact-checkers, responsible for correcting misconceptions and strengthening critical digital literacy. These findings underscore that these digital moral challenges are integrated with cognitive, emotional, and social development in SD students.

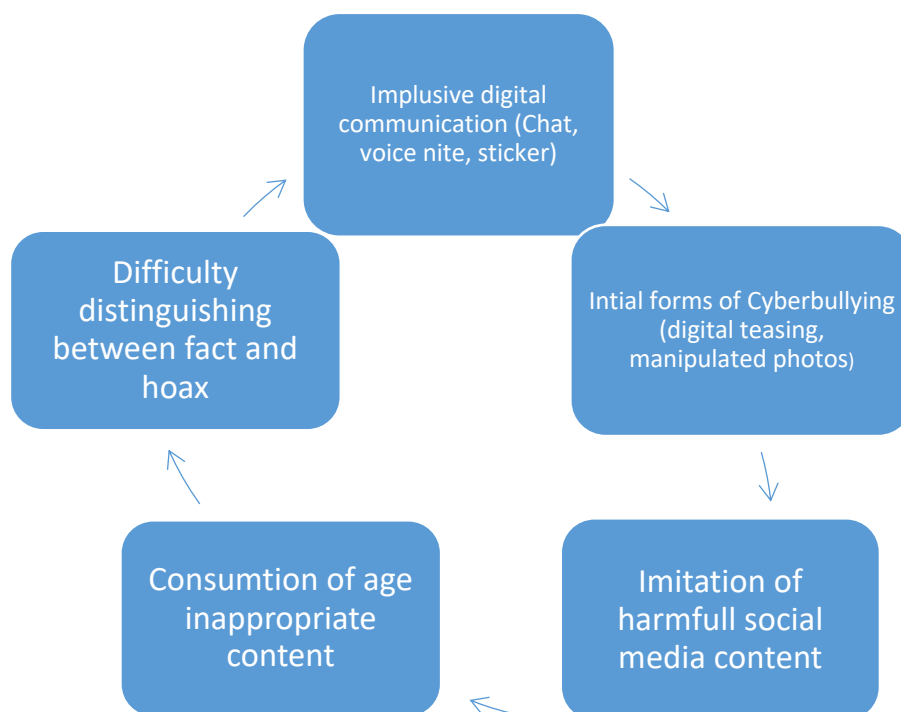


Figure 2. Digital Moral Challenges among Elementary School Students

3.3. Effectiveness of Ethics Strengthening Strategies in SD Contexts

Results show that digital ethics training and integration of character values into technology-based learning are among the most effective strategies. Training helps teachers understand ethical risks, while character integration shapes students' digital behavior. For SD students, concrete examples and repetitive modeling have proven crucial because moral reasoning is still developing. Teachers who consistently embed ethical reminders into digital lessons report fewer behavioral incidents.

Collaboration with parents emerges as a critical factor in strengthening digital ethics. Because many digital behaviors occur at home, school-based efforts must be complemented by parental supervision. In classrooms where teachers actively communicate with parents about digital rules and student progress, fewer violations occurred. This synergy ensures consistency between home and school expectations, reducing moral conflict for young learners.

However, the findings also reveal weaknesses in the implementation of digital ethics strategies. Many training sessions remain theoretical, lacking real classroom simulations or SD-specific examples. Additionally, some schools lack digital ethics policies or monitoring systems, resulting in isolated and inconsistent efforts by teachers. These weaknesses demonstrate that effective ethical development requires a combination of teacher competence, parental involvement, and institutional policy support.

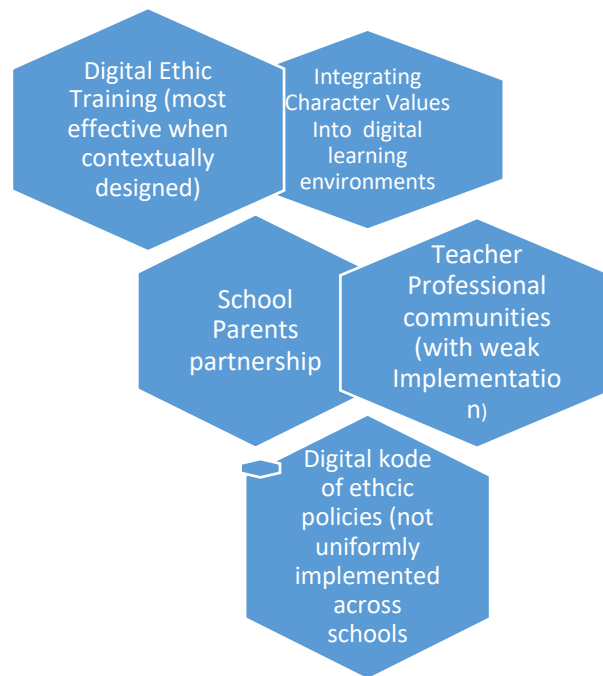


Figure 3. Strategies for Enhancing Ethical Practices among Elementary School Teachers

3.4. Comparative Interpretation of Teacher Role Shifts

The findings align with those emphasizing that primary school teachers must assume a dual role as educators and digital ethics supervisors (Finefter-Rosenbluh & Perrotta, 2023; Galindo-Domínguez & Bezanilla, 2021). This alignment suggests a shared recognition across studies that SD students' moral development requires constant adult guidance, especially in digital contexts. Young learners cannot self-regulate their behavior without structured mentorship.

However, the findings contrast with those of Roick et al. (2023) and Galvis & Carvajal (2022), who argue that digital learning success depends primarily on technical mastery. The present study shows that although technology skills are important, they are insufficient without ethical competence. In SD settings, moral issues often arise before technical issues, indicating that ethical readiness is equally essential.

The results also extend prior research by demonstrating that the shift in teacher roles is more pronounced at the SD level because younger students are more impressionable. Thus, the study enriches the literature by showing the age-sensitive nature of ethical guidance, a nuance not fully addressed in studies focusing on secondary or higher education. In conclusion, the comparative evidence supports a unified understanding that digital transformation demands an ethical transformation in teacher roles. SD teachers require more explicit ethical frameworks, given the developmental stage of their learners.

3.5. Discussion of Digital Moral Challenges

The findings reinforce that digital platforms significantly shape children's emotional responses (Steinert & Dennis, 2022; Zhao et al., 2025). The impulsive nature of students with SD makes them highly susceptible to moral risks online. Their emotional volatility explains why misunderstandings in digital contexts easily escalate into conflicts.

The strong influence of imitation aligns with social learning theory and supports this.

However, this study adds that SD students imitate more intensively than older students due to limited critical filters (Álvaro et al., 2022). This strengthens the argument that early-age digital intervention is essential.

Some studies emphasize parental influence over digital behavior, but this study finds that peer interactions in digital spaces are equally influential. This indicates that moral development is shaped by multiple digital ecosystems rather than solely by the home environment. Overall, the identified digital moral challenges underscore the urgency of implementing structured digital ethics programs tailored to SD students.

3.6. Comparing Strategy Effectiveness

The positive effect of digital ethics training is supported by Kao et al. (2024), who found that teacher competence increases with structured modules. However, the present study highlights that training must include real SD cases, addressing a gap left in prior studies. The strong role of parental collaboration aligns with findings from Deng et al. (2023), showing that digital behavior in early childhood cannot be shaped by schools alone. The joint responsibility model strengthens behavior consistency.

Contrary to the claim that training is the main barrier, this study shows that the lack of a school policy is equally problematic. This dual-barrier explanation enriches the understanding of strategy limitations. Thus, improving ethical practices requires systemic change: teacher training, policy development, and family engagement.

Across studies, there is a strong consensus that SD students face unique digital moral challenges requiring early ethical intervention. This confirms the developmental sensitivity highlighted in previous literature. The role of teachers must evolve toward ethical digital mentorship. This study advances this argument by emphasizing the SD-specific dimensions of such mentorship.

Effective strategies must combine teacher competence, parental involvement, and institutional policy. Partial approaches cannot address the complexity of SD digital behavior. The synthesis thus proposes a digital-integrative ethics model for SD: a framework in which ethical instruction, digital literacy, and school governance operate in concert to safeguard young learners.

4. CONCLUSION

This study concludes that the implementation of teacher professional ethics is essential for addressing the digital moral challenges increasingly faced by primary school students. First, the findings indicate that teachers' roles have shifted from merely delivering content to serving as digital mentors who guide students' online behavior and uphold ethical standards in technology-supported learning. This responds directly to the study's objective of identifying how teachers' ethical responsibilities evolve in digital environments.

Second, the research reveals that SD students experience specific digital moral issues such as impulsive communication, imitation of inappropriate online content, and early cyberbullying, which require ethical supervision tailored to their developmental stage. This aligns with efforts to identify the moral challenges students encounter in digital spaces.

Third, the strategies implemented, such as digital ethics training, character-based digital learning, and collaboration with parents, have been effective. However, their success depends on consistent school policies and contextual support. This finding supports the

objective of examining approaches that strengthen ethical professionalism in primary education.

Overall, the study affirms that ethical competence, supportive school governance, and cooperation with families form the foundation for strengthening teacher professionalism in the digital era, ensuring that primary school students can navigate digital spaces safely and responsibly.

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