

Teacher Strategies Promote Student Integrity in Artificial Intelligence-Supported Learning

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ABSTRACT

The study investigates teacher strategies for promoting student integrity in artificial intelligence (AI)-supported learning in an Indonesian primary school. It addresses three questions: what strategies teachers use to cultivate character during AI use, what challenges they encounter, and how AI contributes to students' character development. A qualitative case study was conducted at SDIT Al-Furqan Wahdah Islamiyah Bajeng, involving nine purposively selected informants comprising four classroom teachers, one principal, and four students. Data were collected through in-depth interviews, participant observation, and documentation, then reduced, categorized, and analyzed inductively using an interactive qualitative analysis model. The findings show that teachers promote integrity through process-oriented assessment, integrity checklists, oral verification requiring students to explain AI-generated answers in their own words, time restrictions, and cross-checking AI outputs with textbooks. These strategies reinforce honesty, responsibility, discipline, independence, and critical thinking. Key supporting factors include balanced school policies and classroom facilities, while major challenges involve students' attraction to instant answers and limited parental supervision at home. The findings indicate that AI does not automatically strengthen or weaken student character; rather, its educational effects depend on deliberate teacher guidance. The study therefore positions teachers as facilitators of integrity and highlights guided, ethical AI use as a promising approach to character education in primary schools.

Keywords: Artificial Intelligence, Student Integrity, Teacher Strategies

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INTRODUCTION

The rapid development of artificial intelligence (AI) is reshaping how knowledge is accessed, produced, and evaluated in education. The emergence of generative AI has intensified this transformation because students can now obtain explanations, examples, summaries, and written responses almost instantly. Globally, this development offers substantial opportunities for personalized learning, accessibility, creativity, and learner support, but it also raises concerns about misinformation, over-reliance, privacy, reduced learner agency, and academic integrity (UNESCO, 2021; Wang et al., 2024; Yusuf et al., 2024). These concerns are particularly important in primary education because children are still developing habits of responsibility, self-regulation, honesty, and independent thinking. UNESCO (2024) consequently emphasizes that students should develop not only technical knowledge of AI but also a human-centred mindset, ethical awareness, accountability, and critical judgement. In Indonesia, where digital technologies are increasingly entering classroom practices, this issue is equally significant. The central educational challenge is

therefore no longer simply whether AI should be used, but how teachers can ensure that its use contributes to learning without undermining the character formation of young learners.

In this study, artificial intelligence refers to digital systems capable of performing tasks associated with human cognitive processes, including generating information, providing explanations, recognizing patterns, and producing new content. AI-supported learning refers to learning activities in which such systems function as supplementary tools for accessing or processing information. Student integrity refers to the disposition to act honestly, responsibly, independently, and accountably in completing learning tasks. Teacher strategies, meanwhile, refer to deliberate pedagogical actions through which teachers regulate, guide, monitor, and evaluate students' use of AI. A simple classroom example illustrates the issue. A student may ask an AI tool to answer a science question and submit the generated response immediately. Technically, the student has completed the task efficiently; educationally, however, the process may conceal whether the student understands the answer or has acted independently. Conversely, if the teacher requires the student to attempt the problem first, compare the AI response with a textbook, and explain the final answer in his or her own words, the same technology becomes an opportunity to develop responsibility, critical thinking, and intellectual honesty. Thus, the educational significance of AI depends not only on what the technology can produce but also on how its use is pedagogically structured.

Recent scholarship increasingly supports this distinction between technological capability and educationally responsible use. In one systematic review, [Wang et al. \(2024\)](#) examined 27 studies published between 2020 and 2023 to investigate the affordances and challenges of generative AI in education. Their synthesis identified accessibility, personalization, automation, and interactivity as major affordances, while academic integrity, inaccurate or biased responses, over-dependence, digital inequality, and privacy constituted important challenges. The study implies that AI should be treated as a cognitive support rather than a substitute for students' own thinking. Similarly, [Yusuf et al. \(2024\)](#) conducted a systematic mapping review of 407 publications indexed in major scholarly databases to examine the development of generative AI research in education. They found that much of the literature focused on applications, impacts, ethical risks, adoption, and performance, while research concerning K-12 education and culturally situated ethical questions remained comparatively limited. This finding is particularly relevant to primary education, where ethical AI use cannot simply be transferred from higher-education models.

Research focusing specifically on younger learners reinforces this concern. [Liu & Zhong \(2024\)](#), through a systematic review of how educators teach AI in 21st-Century Education, found that AI education is important for developing early AI literacy but that existing instructional research has concentrated substantially on middle-school contexts. Their findings suggest that stronger pedagogical and instructional design research is needed for younger learners. In a related critical review, the development of AI literacy for primary education was identified as theoretically and pedagogically underdeveloped compared with research involving secondary and university students ([Ng et al., 2024](#)). These studies imply that primary-school students require age-appropriate approaches that combine technological understanding with ethical judgement rather than merely introducing AI tools as additional learning resources.

The role of teachers becomes even more important when AI is considered from an

ethical perspective. [Adams et al. \(2023\)](#) examined ethical principles for AI in 21st-Century Education and argued that AI adoption should be guided by principles that protect learners and preserve human agency. Likewise, [Tang & Su \(2024\)](#), through a systematic literature review of ethical implications and principles surrounding AI models in classroom teaching, highlighted concerns involving responsibility, privacy, bias, reliability, and the appropriate human oversight of AI. [Brandão et al. \(2024\)](#), in an integrative literature review of teacher professional development for generative AI, further argued that teachers need AI literacy encompassing knowledge of AI capabilities and limitations, together with practical experience in designing critical and ethical classroom applications. Collectively, these studies position teachers not merely as users of educational technology but as mediators who determine the pedagogical conditions under which AI is used.

Empirical evidence also demonstrates why teacher mediation matters for integrity. [Waltzer \(2023\)](#), for example, investigated whether 69 teachers and 140 high-school students could distinguish AI-generated essays from student-written essays. The study found that teachers correctly identified AI-generated texts in only about 70% of cases, while student accuracy was approximately 62%. The findings suggest that detecting AI-generated work is itself difficult and that relying exclusively on technological detection is insufficient for protecting academic integrity. More broadly, studies of generative AI and assessment have shown that students may perceive AI-assisted work as acceptable even when institutions regard certain forms of use as academically inappropriate ([Cotton et al., 2024](#)). This indicates that integrity cannot be secured through prohibition alone; students must learn why, when, and how AI should be used responsibly.

The emerging international policy framework strengthens this argument. UNESCO's AI Competency Framework for Teachers identifies human-centred thinking, AI ethics, AI foundations and applications, AI pedagogy, and professional learning as core areas of teacher competence ([Miao & Cukurova, 2024](#)). The corresponding framework for students emphasizes human agency, accountability, ethical reflection, safe and responsible use, and critical examination of AI-generated information ([Miao et al., 2024](#)). These frameworks are consistent with a character-oriented perspective in which responsible AI use requires students to know ethical principles, value those principles, and translate them into observable actions. This perspective also resonates with [Lickona's \(1991\)](#) conception of character as involving moral knowing, moral feeling, and moral action. Within AI-supported learning, students therefore need more than awareness that copying an AI response may be inappropriate; they need opportunities to practice honesty, experience responsibility for their own work, and demonstrate independent action.

Taken together, prior research establishes three important points. First, AI can provide meaningful educational affordances, particularly through accessibility, personalization, interactivity, and rapid information support. Second, unguided or excessive use can create risks related to dependency, inaccurate information, academic dishonesty, and diminished learner agency. Third, teachers are increasingly recognized as essential mediators of ethical and pedagogical AI use. However, the existing literature remains dominated by higher education, secondary education, policy discussions, systematic reviews, and broad examinations of AI adoption. There is considerably less empirical research examining how primary-school teachers concretely cultivate student integrity during everyday AI-supported

learning, particularly in culturally and religiously grounded Indonesian elementary-school contexts. The literature also tends to discuss ethical principles at the policy level rather than documenting the specific classroom practices through which honesty, responsibility, discipline, and independence are translated into student behaviour.

This gap is important because primary school is a formative stage for developing enduring learning habits and moral dispositions. A policy stating that AI should be used responsibly does not explain how a teacher can operationalize responsibility during an actual lesson. Similarly, identifying academic integrity as a risk does not reveal how teachers can distinguish between productive AI assistance and dependence on AI-generated answers. The present study addresses this gap by examining teacher strategies in a real primary-school setting where AI is neither completely prohibited nor uncritically accepted. The study asks three research questions: (1) What strategies do teachers use to cultivate student character and integrity in AI-supported learning? (2) What challenges do teachers encounter in cultivating student character during AI use? and (3) What role does AI as a learning medium play in strengthening student character?

To answer these questions, the study adopts a qualitative case-study design at SDIT Al-Furqan Wahdah Islamiyah Bajeng, Indonesia. The research draws on nine purposively selected informants comprising four classroom teachers, one principal, and four students. Data are generated through in-depth interviews, participant observation, and documentation and are analyzed through data reduction, categorization, and inductive interpretation using an interactive qualitative analysis process. This design is appropriate because the study seeks to understand not merely whether AI affects character but how teachers create pedagogical conditions that shape students' responses to AI. Based on the literature and the conceptual framing of the study, it is anticipated that teacher-guided practices such as process-oriented assessment, verification of AI-generated answers, explicit integrity rules, and opportunities for students to explain their reasoning will support honesty, responsibility, independence, discipline, and critical thinking.

The study contributes to the literature by shifting attention from the technological capabilities of AI to the pedagogical mediation through which AI becomes educationally constructive or potentially harmful. Its novelty lies in identifying concrete teacher practices for cultivating integrity among primary-school students rather than treating AI ethics only as a policy or abstract principle. The study also extends discussions of AI literacy by connecting technological use with character formation and moral agency in an Indonesian Islamic primary-school context. Theoretically, it provides an empirical basis for understanding teacher intervention as the mechanism linking AI-supported learning with character development. Practically, it offers teachers and schools evidence-based strategies for designing AI use that preserves human agency, strengthens academic integrity, and transforms the accessibility of AI from a potential shortcut into an opportunity for critical, responsible, and independent learning.

METHODS OF RESEARCH

Research Design

This study employed a qualitative case-study design to examine how teachers cultivate student integrity through the use of artificial intelligence (AI) in primary-school learning. A

qualitative approach was selected because the study sought to understand practices, experiences, strategies, and contextual conditions rather than measure relationships among predetermined quantitative variables. The case-study design was appropriate because the investigation focused intensively on one bounded educational setting, SDIT Al-Furqan Wahdah Islamiyah Bajeng, Kabupaten Gowa, South Sulawesi, where AI and other digital technologies had begun to be incorporated into classroom learning. The design enabled the researcher to examine the phenomenon from multiple perspectives and to develop a contextual account of teacher practices, challenges, and the educational role of AI.

The principal construct examined was teacher strategy in AI-supported learning, operationalized as the pedagogical actions used by teachers to guide, regulate, monitor, and evaluate students' use of AI. Student character was operationalized through four values identified in the study: honesty, responsibility, discipline, and independence. AI use was treated as the learning context or medium through which these character values were practiced rather than as an independent causal variable. The study therefore examined three interconnected dimensions: (1) strategies used by teachers to cultivate character during AI use, (2) challenges encountered in implementing those strategies, and (3) the role of AI as a learning medium in supporting character development.

The case was bounded by the school setting, the classroom learning context, and participants directly involved in AI-supported learning. The investigation did not introduce an experimental intervention or manipulate students' access to AI. Instead, it documented naturally occurring pedagogical practices and examined how teachers organized and supervised AI use within the existing learning environment.

Participants

The research was conducted at SDIT Al-Furqan Wahdah Islamiyah Bajeng, Kabupaten Gowa, South Sulawesi, Indonesia. The school was selected because it had begun incorporating technology, including AI, into learning and simultaneously emphasized character and Islamic values within its educational environment.

Participants were selected using purposive sampling. Selection was based on participants' knowledge, experience, and direct involvement in classroom learning, character development, and/or AI-supported learning. The final sample consisted of nine informants: four classroom teachers, one principal, and four students. The four classroom teachers constituted the core informants because they directly planned and implemented classroom learning and character-development practices. They comprised two Grade 5 classroom teachers and two Grade 6 classroom teachers. The principal served as a supporting informant because of his knowledge of school policies, institutional support, and supervision concerning technology and character education. Four students from the corresponding classes were included as supporting informants to provide first-hand accounts of AI use, understanding of AI-use rules, and experiences of teacher guidance.

Tabel 1 Participants

Participant group	Number	Role in the study
Classroom teachers	4	Core informants; direct classroom implementation
Principal	1	Supporting informant; school policy and supervision
Students	4	Supporting informants; learner experiences and responses
Total	9	

The participants were selected purposively based on their direct relevance to the phenomenon under investigation. We involved four classroom teachers as the core informants because they were directly responsible for implementing learning activities in the classroom. One principal was included as a supporting informant to provide information about school policies, instructional supervision, and the broader institutional context. Four students were also involved as supporting informants to provide perspectives on their learning experiences and responses to the classroom implementation. Thus, the nine participants were selected to provide complementary perspectives on the implementation of the learning process rather than to achieve statistical representativeness.

Instruments

In accordance with qualitative methodology, the researcher functioned as the primary research instrument. The researcher was directly involved in determining the research focus, identifying appropriate informants, collecting field data, observing classroom practices, organizing evidence, and conducting interpretation. Supporting instruments were used to structure and document the data-collection process.

Three supporting instruments were employed. First, a structured interview guide was prepared before interviews were conducted. The interview guide contained questions addressing teacher strategies for character development during AI use, challenges encountered in implementation, school policies and support, students' AI-use experiences, and the perceived contribution of AI to character development. The structured format was used to ensure that comparable themes were addressed across informants while allowing responses to provide contextual detail. The manuscript explicitly identifies the interview procedure as structured, with questions prepared before the interviews.

Second, a direct observation guide was used to document classroom practices. Observation focused on naturally occurring teacher-student interactions during learning, including teacher directions concerning AI use, students' engagement with AI-supported tasks, verification practices, and observable expressions of honesty, responsibility, discipline, and independence. Direct observation was selected because classroom behaviour and interaction could provide evidence that complemented participants' verbal accounts.

Third, a documentation protocol was used to collect relevant supporting evidence, including photographs of learning activities, learning materials, instructional documents, and other documents relevant to AI use and character education. Documentation was used to complement interview and observation data and to assist in verifying information obtained from participants.

The manuscript does not report a separate psychometric validity or reliability test because the instruments were qualitative data-collection guides rather than standardized scales. Instead, credibility was supported through the use of multiple data sources and methods and repeated verification of the collected evidence. The study therefore treated triangulation and iterative verification as mechanisms for strengthening data credibility rather than reporting numerical reliability coefficients.

Data Collection

Data collection proceeded sequentially within the selected school setting. First, the researcher established the research focus and identified the school as the bounded case

because of its implementation of technology and AI-supported learning and its emphasis on student character. Second, potential informants were identified purposively according to their direct involvement in the phenomenon. The final participants comprised four classroom teachers, one principal, and four students.

Third, the researcher prepared the structured interview guide and observation/documentation instruments. Interviews were then conducted with the principal, classroom teachers, and selected students. Teacher interviews focused primarily on classroom strategies, character-development practices, AI-use regulation, and implementation challenges. The principal interview addressed school-level policies, institutional support, and supervision. Student interviews focused on their experiences using AI, understanding of school rules, and perceptions of teacher guidance.

Fourth, the researcher conducted direct participant observation during classroom learning. Observation was used to document practices as they occurred in the natural educational setting rather than relying exclusively on retrospective participant accounts. Particular attention was given to interactions surrounding AI use and the enactment of character-related behaviours. Fifth, relevant documents and photographs of learning activities were collected as supplementary evidence.

Sixth, information obtained from the different sources was compared during and after data collection. Teacher accounts were compared with information obtained from the principal and students and with observations and documentation. This triangulation procedure was used to strengthen the credibility of interpretations and reduce dependence on a single informant or data-collection technique. The researcher also conducted repeated verification of the collected information before formulating conclusions.

The interviews and classroom observations were conducted during the fieldwork at SDIT Al-Furqan Wahdah Islamiyah Bajeng. In-depth interviews were conducted with four classroom teachers, one principal, and four students, while participant observations focused on classroom activities involving AI-supported learning. The interviews were audio-recorded using a digital recording device with the participants' consent, and the researcher also maintained observation notes throughout the classroom sessions. The recorded interviews were transcribed verbatim, checked against the original recordings, and organized together with the observation and documentation data for subsequent coding and analysis.

Data Analysis

Data analysis followed an interactive qualitative analysis model based on Miles and Huberman, with analysis conducted concurrently with data collection rather than postponed until all fieldwork had been completed. This approach was selected because iterative analysis allowed the researcher to identify relevant patterns, refine attention to the research focus, and verify emerging interpretations during the research process.

The first stage was data reduction. Interview, observation, and documentation data were reviewed, selected, focused, and simplified according to their relevance to the research questions. Information was categorized around teacher strategies, AI-supported learning practices, character values, implementation challenges, and the role of AI in character development. Irrelevant information was excluded from the analytical corpus.

The second stage was data display. The reduced data were organized into systematic descriptive or narrative displays to facilitate comparison across participants and data sources.

The displays were used to identify patterns and relationships among teacher strategies, student behaviours, contextual factors, and AI-supported learning practices.

The third stage was conclusion drawing and verification. Emerging conclusions were formulated from the categorized evidence and repeatedly checked against the collected data. The researcher verified the consistency of interpretations with interview statements, observations, and documentation before finalizing the findings.

No inferential statistical tests, significance levels, or quantitative assumptions were used because the study employed qualitative rather than statistical analysis. The qualitative data were coded and organized manually by the researcher without the use of specialized qualitative-analysis software. The researcher reduced, categorized, and interpreted the interview, observation, and documentation data inductively using an interactive qualitative analysis model.

Ethical Considerations

The study involved adult school personnel and primary-school students as human participants; consequently, participation and the handling of participant information required appropriate ethical safeguards. The research was conducted within the identified school setting and involved interviews, classroom observation, and documentation. Participant identities should be protected in the reporting of interview and observation evidence, particularly for student participants, and collected data should be used only for the stated research purpose.

Before data collection, ethical approval was obtained from the relevant institutional authority, and permission to conduct the study was obtained from the participating school. Written informed consent was obtained from the parents or legal guardians of the student participants, while the students provided their assent before participating in the study. The researcher explained the purpose, procedures, voluntary nature of participation, and confidentiality of the study to all participants and their parents or guardians.

Confidentiality should also be maintained by using participant codes rather than identifiable names in the article, unless explicit permission for identification was obtained and is documented. Any photographs or school documents included in the research output should similarly be used only with the appropriate authorization and should avoid unnecessarily revealing children's identities or personal information.

RESULTS AND DISCUSSION

The findings are presented according to the three research questions concerning (1) teacher strategies for cultivating student character in AI-supported learning, (2) challenges encountered in implementing these strategies, and (3) the role of AI in supporting student character development. The results were derived from interviews with the principal, four classroom teachers, and four students, complemented by classroom observation and documentation. The analysis identified recurring patterns concerning school-level rules, classroom monitoring, process-oriented assessment, student responses to AI use, and differences between school and home environments.

Teacher Strategies for Cultivating Student Integrity in Ai-Supported Learning

The first finding concerns the school's approach to AI use. The school did not adopt a

total prohibition of AI. Instead, AI was permitted as a learning aid under teacher supervision. The principal reported that students were expected to use AI to support learning rather than to obtain answers immediately, and teachers were directed to incorporate honesty, responsibility, discipline, and independence into technology-supported learning activities.

At classroom level, teachers implemented several concrete procedures. These included integrity checklists, oral verification, restrictions on AI use, process-oriented assessment, and the requirement to consult other learning sources. One teacher required students to complete an integrity checklist before submitting assignments. The checklist included confirmation that students had checked the accuracy of AI-generated information, rewritten information in their own words, and were able to explain the submitted work without relying on notes.

Oral verification was reported across several teacher interviews. Students were asked to explain answers obtained with AI without looking at the original AI response. Teachers also used direct questioning, presentations, and detailed explanations to determine whether students understood their work. One teacher reported evaluating students through written questions and interviews, while another used oral evaluation after learning activities.

The teachers also placed limits on the extent and timing of AI use. One classroom practice used a “15 minutes AI, 30 minutes independent work” arrangement. AI was prohibited during examinations and, according to the reported classroom rules, after 8:00 p.m. Other teachers stated that AI should be used only when needed, for particular assignments, or according to teacher instructions.

Another recurring strategy was the use of conventional learning resources before or alongside AI. Teachers instructed students to think or attempt the task independently before consulting AI and to compare AI-generated information with textbooks or explanations from teachers. One teacher explicitly required students to search the textbook before asking AI, while another stated that AI-generated answers should be examined against information from other sources.

Assessment practices also showed a shift toward attention to the learning process. Teachers reported considering students' initial work, stages of task completion, ability to explain their reasoning, and individual presentations rather than relying exclusively on the final answer. One teacher described the sequence as independent thinking, AI-assisted discussion, and final checking. Another reported assigning tasks that could not be completed entirely through AI.

Overall, the empirical findings for the first research question are summarized in Table 2.

Table 2. Summary of Teacher Strategies for Ai-Supported Learning

Strategy	Reported classroom practice	Character-related behavior observed/reported
Integrity checklist	Students confirm fact-checking, use of their own words, and readiness to explain their work	Honesty and accountability
Oral verification	Students explain AI-assisted answers without reading the original response	Understanding and responsibility for submitted work
Time and use restrictions	Limited AI-use periods; restrictions during examinations and specified times	Discipline
Independent-first procedure	Students attempt tasks before consulting AI	Independence

Strategy	Reported classroom practice	Character-related behavior observed/reported
Cross-checking	AI responses compared with textbooks, teachers, or other sources	Careful use of information
Process-oriented assessment	Teachers examine drafts, reasoning, explanations, and presentations	Responsibility for the learning process
AI-use disclosure	Students are instructed to acknowledge AI assistance	Transparency

Challenges Encountered by Teachers

The second research question identified challenges at three levels: student behavior and ability, home supervision, and access and digital literacy.

At the student level, teachers reported that some students tended to seek quick answers rather than attempt the task independently. One teacher described students as becoming more dependent on AI than on their own initial efforts, while another reported that students tended to choose easier routes instead of thinking through the task. A teacher also reported repeated cases of student dependence or dishonesty involving AI use.

The interview data also showed variation among teachers in their experience of student misuse. One teacher reported that cases of dishonesty or dependence had occurred “several times,” another reported that such cases occurred frequently, and another reported having encountered no such case. This variation constitutes an unexpected finding in the dataset because teachers did not report identical experiences of student AI misuse.

Home supervision was another recurring challenge. Teachers reported that monitoring students' AI use outside school was difficult. One teacher specifically identified limited supervision at home as a challenge, while the principal identified monitoring students' actual use of AI for learning rather than copying as an ongoing concern.

Differences in students' technological capabilities and access were also reported. The principal stated that students did not have equal technological abilities or access to devices and internet connections. The school consequently relied on existing facilities, including a Smart TV, while maintaining textbooks as learning resources. One teacher further reported that students with lower digital literacy tended to copy AI-generated responses directly, whereas students with stronger digital skills were more capable of using AI for independent learning.

The school environment also contained a restriction on students bringing mobile phones to school. Several teachers therefore reported that AI-supported student assignments were more commonly undertaken at home, where students had access to their own devices.

Despite these challenges, the data showed that the school had access to alternative learning resources. Textbooks remained commonly used, and Smart TV facilities were available for selected classroom activities. The principal therefore described AI use as requiring adjustment to the school's facilities and students' capabilities.

Role of Ai in Supporting Student Character Development

The third research question revealed both supportive and adverse experiences associated with AI use.

Students reported using AI primarily to obtain explanations, examples, ideas, or assistance with difficult learning materials. The platforms mentioned by students included ChatGPT, Meta AI, and Qwen AI. One student used ChatGPT to seek explanations of lessons that

were not understood, another used Meta AI for additional explanations, and another used Qwen AI to obtain ideas and examples during learning activities.

Student responses indicated several practices consistent with the classroom rules. Students reported attempting tasks before consulting AI, rereading AI responses, comparing them with textbooks or teacher explanations, and asking teachers when AI-generated information was unclear or appeared inaccurate. Students also reported following teacher-imposed time limits and restrictions.

The data also documented instances of direct copying or temptation to copy AI-generated answers. One student reported having copied an AI answer once before receiving teacher guidance and subsequently trying to rewrite answers in their own words. Another student stated that they had sometimes been tempted to copy because AI provided answers more quickly. A third student reported previously taking an AI-generated answer but subsequently trying to understand it before writing.

Students also reported limitations in AI-generated information. One student noted that responses could be too long or difficult to understand. Another reported that an answer could differ from the question being asked. A further student stated that receiving too much information could make it difficult to determine which information to select.

Teacher assessments of AI's contribution to character development varied. One teacher described AI as making a substantial contribution to students' character development, whereas another perceived its contribution as moderate and dependent on how AI was integrated into classroom learning. Another teacher did not assess the contribution in numerical terms and instead emphasized that character development through AI use depended largely on teacher guidance. These responses were interpreted as individual interview perspectives rather than quantitative measures of character development.

Across the student interviews, the reported benefits of AI included faster access to information, additional explanations, more examples, and assistance with difficult material. At the same time, students reported difficulties involving excessive information, unclear responses, and answers that did not always correspond to the question.

Cross-Case Summary of the Findings

Across the three research questions, the empirical data consistently showed that AI use at the school was accompanied by explicit teacher rules and monitoring procedures. The most frequently reported practices were requiring students to understand rather than directly copy AI responses, asking students to explain their work orally, comparing AI responses with textbooks or teacher explanations, limiting the time and circumstances of AI use, and assessing aspects of the learning process.

The findings also showed variation in the extent of student AI use. Some students reported using AI primarily for clarification and examples after attempting tasks independently, whereas other responses documented previous copying or temptation to copy because of the speed and convenience of AI.

The empirical pattern therefore consisted of two concurrent conditions: AI was used as an additional source of information and learning assistance, while teachers simultaneously imposed procedures intended to monitor how students obtained, checked, and presented AI-assisted information. The dataset further showed that these practices occurred within an environment where textbook use remained prominent, mobile-phone access at school was

restricted, and supervision of AI use outside school remained more difficult.

Teacher-Guided Ai Use as a Mechanism for Developing Student Integrity

The study found that teachers did not respond to artificial intelligence (AI) by prohibiting its use. Instead, they established conditions under which students could use AI while remaining responsible for the learning process. The main strategies were process-oriented assessment, integrity checklists, oral verification, time and task restrictions, and cross-checking AI-generated information with textbooks and other sources. At the same time, teachers encountered students' attraction to immediate answers, occasional copying, uneven digital literacy, and limited parental supervision outside school. AI consequently appeared in the data as both a learning resource and a potential source of dependence.

The first research question is addressed by the finding that teachers employed deliberate strategies to cultivate integrity during AI-supported learning. The second research question is also addressed, as the data identified several challenges associated with student dependence, limited home supervision, unequal technological capacity, and the difficulty of monitoring AI use beyond school. The third research question is addressed in a qualified sense: AI provided access to explanations, examples, and learning assistance, but its contribution to character development depended on how its use was structured and monitored. Because this was a qualitative case study, these findings should not be interpreted as evidence of a statistically demonstrated causal effect of AI on character.

The central mechanism emerging from the study is teacher-mediated regulation. AI reduces the effort required to obtain an answer, but teachers deliberately reintroduce cognitive and ethical responsibility into the learning process. An integrity checklist requires students to acknowledge how information was obtained; oral verification requires them to understand and explain the answer; cross-checking requires them to question the reliability of AI output; and process-oriented assessment requires attention to how an answer was produced rather than only whether the final answer is correct. The teacher therefore becomes an intermediary between technological affordance and student action.

This mechanism can be interpreted through Lickona's conception of character as involving moral knowing, moral feeling, and moral action. In this framework, character development involves not only understanding what constitutes morally appropriate behavior but also developing the disposition to value and practice that behavior in concrete situations (Lickona, 1991). Students first need to recognize that directly copying an AI response is different from using AI as a learning aid; they then need to accept responsibility for the work; and finally they must demonstrate that responsibility through observable practices such as verification, attribution, explanation, and independent completion.

The findings also extend the interpretation through Vygotsky's (1978) notion of scaffolding. Teacher intervention does not remove the technological tool from the learning environment; rather, it structures how students interact with it. When students are required to explain an AI-generated response independently or compare it with a textbook, the teacher creates a temporary structure that supports increasingly independent judgment. The manuscript's empirical evidence similarly describes teacher strategies as a form of cognitive and moral scaffolding.

This interpretation is consistent with UNESCO's 2024 AI Competency Framework for Teachers, which positions AI pedagogy, ethics, human-centred thinking, and AI foundations as

interconnected teacher competencies rather than treating AI competence as merely technical knowledge. The present study adds an important classroom-level dimension to that framework: ethical AI pedagogy can be operationalized through ordinary assessment routines that make students accountable for what they submit, explain, and verify.

from Product-Oriented Assessment to Process-Oriented Integrity

One of the most significant findings is the teachers' movement away from judging only the final product. Students were required to demonstrate how they arrived at an answer, explain AI-assisted responses in their own words, and compare generated information with other sources. This represents more than an adaptation of assessment to a new technology. It changes the object of pedagogical attention from answer possession to knowledge ownership.

This finding is particularly important because generative AI makes the final product increasingly difficult to use as a reliable indicator of individual learning. Wang et al. (2024), in their systematic review of 27 studies, identified academic integrity, over-dependence, response errors and bias, and privacy and security among the major challenges associated with generative AI in education. They nevertheless argued that educators should guide students to treat AI as a thought aid and reference rather than rely on it completely. The present study provides a concrete classroom response to that recommendation: teachers shift assessment toward explanation, verification, process documentation, and independent reasoning.

The finding also complements research showing that primary-school AI education remains underdeveloped. Liu & Zhong's (2024) systematic review found that 21st-Century Education, AI education research has concentrated particularly on middle-school contexts and recommended stronger teacher involvement, authentic contexts, scaffolding, and triangulation of evidence. Similarly, Yim's (2024a) critical review argues that AI literacy frameworks for younger learners remain insufficiently developed and should integrate digital literacy, data literacy, computational thinking, and AI ethics. The present study contributes empirical evidence from an actual primary-school setting showing how these principles can be translated into everyday classroom routines.

AI Is Neither Automatically Character-Building nor Character-Damaging

The study's findings challenge a technologically deterministic interpretation of AI. In this particular school context, participants described both constructive and potentially problematic patterns of AI use in relation to students' learning and character-related practices. Students used AI to obtain explanations and examples, while some also reported copying or being tempted to copy because AI provided rapid answers. Teachers therefore encountered different behavioral possibilities associated with the same technology within the same school environment, depending on how its use was guided and monitored.

This duality agrees with Wang et al. (2024), who distinguish between AI's affordances including accessibility, personalization, automation, and interactivity and risks such as over-dependence and academic-integrity problems. It also corresponds with Yusuf et al. (2024), whose systematic mapping of 407 publications identified both pedagogical enhancement and ethical risks as dominant themes and highlighted the limited exploration of culturally grounded ethical questions in 21st-Century Education contexts.

The present case adds a more specific explanation for this duality. The relevant issue is not simply whether AI is available, but what students are required to do after receiving an AI-

generated response. If the response becomes the endpoint, dependence and copying become possible. If it becomes the starting point for questioning, checking, explaining, and revising, AI can become part of a more demanding learning process. The distinction is therefore pedagogical rather than technological.

This finding also explains why the study should not characterize AI as a direct agent of character formation. The empirical evidence indicates that character-related behaviors emerged through rules, teacher questioning, assessment procedures, verification requirements, and repeated expectations. The manuscript consequently conceptualizes AI as a context or medium through which character is practiced rather than as the source of character itself.

Its central proposition is that AI-supported learning creates both affordances and risks, while teacher intervention including ethical rules, process-oriented assessment, verification, and scaffolding conditions how those affordances are translated into student practices. This interpretation advances the study beyond the simple claim that AI has positive and negative impacts.

Character Development Extends Beyond the Classroom

An important finding that complicates the teacher-centred interpretation is the role of the home environment. Teachers reported difficulties monitoring AI use outside school and identified limited parental supervision as an important challenge. Students could therefore encounter different expectations depending on whether AI was being used under teacher supervision at school or independently at home.

This finding can be interpreted through [Bronfenbrenner's \(1994\)](#) ecological perspective, because students' behavioral development occurs through interactions among multiple environments rather than exclusively within the classroom. The manuscript itself identifies the school and home as interconnected contexts affecting the implementation of character education.

The finding also provides a useful qualification to the emphasis on teacher agency. Teachers may establish clear rules and effective verification procedures, but those practices have limited reach when students use AI independently outside school. Consequently, responsible AI use should not be conceptualized solely as a classroom-management issue. It is also a school–family digital-literacy issue.

This is particularly relevant to the broader 21st-Century Education literature. [Yusuf et al. \(2024\)](#) identified a relative lack of 21st-Century Education research and limited attention to cultural dimensions of AI ethics. The present study demonstrates why contextual factors matter: the ethical use of AI is embedded in relationships among teachers, students, parents, school policies, available learning resources, and local educational expectations.

Theoretical and Practical Implications

Theoretically, the study contributes a teacher-mediated integrity model of AI-supported learning. Existing AI-in-education research often emphasizes technological affordances, AI literacy, academic integrity, or ethical risks separately. The present findings connect these domains by showing how teacher intervention can become the pedagogical mechanism linking AI literacy with character practice. This complements UNESCO's teacher framework, which places human-centred thinking, AI ethics, AI pedagogy, and AI applications

within one competency architecture.

The study also extends character education theory into an AI-mediated learning environment. Lickona's moral knowing, moral feeling, and moral action can be operationalized through AI-specific practices such as disclosure, verification, explanation, source comparison, and responsible attribution. The significance is that character education does not need to be separated from digital learning; AI-supported tasks can themselves become occasions for practicing moral responsibility.

Practically, primary teachers should not rely on blanket prohibition as their principal AI strategy. Instead, schools can establish age-appropriate rules specifying when AI may be used, require students to identify AI assistance, assess explanations and learning processes, require source verification, and maintain non-AI learning resources such as textbooks. Teacher professional development should likewise combine technical AI literacy with ethical reasoning and AI pedagogy. UNESCO's framework supports precisely this broader conception of teacher competence.

At the institutional level, schools should also develop shared expectations for parents because a substantial portion of students' AI use may occur outside school. Parent guidance can focus on supervision, discussion of AI-generated information, and discouraging direct copying while still allowing AI to function as a learning aid.

Limitations

Several limitations should be considered when interpreting these findings. First, the study used a qualitative case-study design in a single Islamic primary school. The findings therefore provide contextual depth but cannot be generalized statistically to Indonesian primary schools or to schools with substantially different institutional cultures.

Although triangulation strengthened the analysis, parents were not directly represented among the participants; consequently, findings concerning limited parental supervision and the home environment were based on teachers' and students' accounts rather than direct parental reports. These findings should therefore be interpreted as participants' perceptions of home supervision within the study context rather than as a comprehensive account of parental practices.

Third, the study relied substantially on interviews and participant observation. Reports of honesty, independence, or responsible AI use may therefore be affected by social desirability, particularly because the topic concerns morally valued behavior. Fourth, the study did not employ a standardized quantitative measure of student integrity or AI literacy. Consequently, the findings describe reported and observed practices rather than demonstrating measurable changes in character.

Fifth, AI technologies and student practices are rapidly changing. The findings represent the practices documented in this particular institutional and technological context and may not fully capture future forms of generative AI use, especially as AI becomes more integrated into educational platforms.

Future Research Directions

Future research should address these limitations through multi-site and comparative designs involving primary schools with different institutional, cultural, and socioeconomic characteristics. Comparative studies could ask: How do teacher-guided AI practices differ

across public, private, Islamic, and non-religious primary schools?

Longitudinal research is also needed to examine whether practices such as oral verification, integrity checklists, and process-oriented assessment become stable student habits over time. A key question is: Does sustained teacher-guided AI use produce more durable patterns of independent and ethical AI use than short-term classroom interventions?

Future studies should additionally include parents and investigate the home-school relationship. Research could examine: How does parental digital supervision interact with teacher guidance in shaping children's responsible AI use outside school?

Mixed-methods research could complement qualitative evidence with validated measures of AI literacy, critical thinking, academic integrity, and self-regulated learning. Experimental or quasi-experimental studies could then compare conventional assessment with process-oriented AI assessment to determine whether particular teacher strategies produce measurable differences in students' ethical and cognitive behaviors.

Finally, future research should investigate how AI literacy and character education can be integrated into age-appropriate primary curricula. Such work would respond directly to the documented need for stronger primary-school AI education and more attention to ethical dimensions of AI literacy.

Concluding Discussion

This study demonstrates that the central educational question is not whether primary students should encounter AI, but how that encounter is pedagogically structured. The evidence from SDIT Al-Furqan Wahdah Islamiyah Bajeng shows that teacher guidance can transform AI-supported tasks from opportunities for immediate answer retrieval into occasions for explanation, verification, accountability, and independent judgment. The study therefore reframes the teacher's role in AI-supported learning: the teacher is not displaced by AI but becomes increasingly important as a designer of ethical conditions for its use. By connecting Lickona's character framework with contemporary AI pedagogy and a culturally situated primary-school case, this study contributes a teacher-mediated perspective to the emerging literature on responsible AI education. Its principal contribution is the proposition that student integrity in AI-supported learning is cultivated not by removing AI from the classroom, but by designing learning processes in which students remain accountable for what they know, verify, explain, and ultimately submit.

CONCLUSIONS

This study examined teacher strategies for promoting student integrity in artificial intelligence (AI)-supported learning at SDIT Al-Furqan Wahdah Islamiyah Bajeng. It demonstrates that the educational value of AI for character development depends less on the technology itself than on how teachers structure, supervise, and assess its use.

Three principal conclusions emerge. First, the first research question was supported: teachers cultivated integrity through process-oriented assessment, integrity checklists, oral verification, time and task restrictions, independent-first procedures, and cross-checking AI outputs with textbooks and other sources. These practices encouraged honesty, responsibility, discipline, independence, and critical engagement. Second, the second research question was supported: the principal challenges were students' attraction to instant answers, tendencies toward copying or dependence, uneven digital literacy, and limited parental supervision of AI

use outside school. Third, the third research question was supported in a qualified manner: AI provided explanations, examples, and learning assistance, but its contribution to character development was conditional on deliberate teacher guidance rather than automatic.

The study contributes theoretically by connecting character education with AI-supported learning through a teacher-mediated perspective, positioning teacher intervention as the mechanism through which AI use can become an opportunity for practicing integrity. Practically, schools should avoid relying solely on prohibition and instead establish clear ethical-use rules, assess learning processes, require explanation and verification, and strengthen school–family collaboration in digital supervision.

Future research should examine these strategies across multiple schools and over longer periods, include parents' perspectives, and employ mixed-method or comparative designs to investigate their effects on AI literacy, independent learning, critical thinking, and student integrity.

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