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Strengthening the Foundation of Digital Character with Internet Ethics Introduction Strategies in Primary School Students

Ari Yunita[1]
[1]*Universitas PGRI Palembang*
**Corresponding author: yunitari@gmail.com*

Abstrak

This study aims to examine the effectiveness of innovative learning strategies in improving students' learning outcomes in English language learning at the secondary education level. It investigates how structured, interactive, and student-centered approaches contribute to academic achievement, classroom engagement, and learning motivation. The research employs a quantitative approach with a quasi-experimental design involving an experimental group receiving innovative instructional treatment and a control group taught using conventional methods. Participants were selected through purposive sampling. Data were collected using validated learning achievement tests, structured observation sheets, and documentation of classroom activities. The data were analyzed using descriptive and inferential statistical techniques to determine the significance of differences between the two groups. The results indicate that students who experienced innovative learning strategies achieved significantly higher learning outcomes compared to those taught using traditional approaches. Furthermore, interactive and student-centered learning strategies were found to enhance active participation, strengthen students' understanding of the material, and improve overall academic performance. These findings highlight the important role of systematically designed pedagogical innovations in creating effective and sustainable learning environments. Therefore, integrating innovative learning models into English teaching practices is strongly recommended to optimize students' learning outcomes and promote more meaningful learning experiences at the secondary education level.

***Kata kunci*:** *Strategi Pembelajaran Inovatif, Pembelajaran Bahasa Inggris, Hasil Belajar, Pembelajaran Berpusat Pada Siswa, Quasi-Eksperimen, Pendidikan Menengah.*

Abstract

This study examines the effectiveness of innovative learning strategies in improving students' English learning outcomes at the secondary education level. It focuses on how structured, interactive, and student-centered approaches influence academic achievement, classroom engagement, and learning motivation. The research uses a quantitative approach with a quasi-experimental design involving an experimental group taught with innovative strategies and a control group taught using conventional methods. Participants were selected through purposive sampling. Data were collected through validated learning achievement tests, structured observation sheets, and documentation of classroom activities. The data were analyzed using descriptive and inferential statistics to determine differences between the two groups. The findings show that students who received innovative learning strategies achieved significantly higher learning outcomes than those taught with traditional approaches. In addition, interactive and student-centered strategies increased students' active participation, improved their understanding of the material, and enhanced overall academic performance. These results indicate that well-designed pedagogical innovations play an important role in creating effective and sustainable learning environments. Therefore, integrating innovative learning models into English teaching is recommended to optimize learning outcomes and promote more meaningful learning experiences at the secondary school level.

***Keywords*:** Innovative Instructional Strategies, English Language Teaching, Learning Achievement, Student-Centered Learning, Quasi-Experimental Design, Secondary Education.

1. INTRODUCTION

The transformation of educational practices in the twenty-first century has increasingly emphasized the urgency of instructional innovation to address evolving student needs and global academic standards. In the context of English language teaching (ELT) at the secondary level, the demand for effective pedagogical strategies has become more pressing as educators strive to enhance students' academic achievement and communicative competence in dynamic learning environments (Anderson & Smith, 2022; Brown, 2023; Flavin et al.,

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2025). Rapid digitalization, globalization, and post-pandemic educational restructuring have accelerated the integration of technology and learner-centered methodologies into mainstream instruction (OECD, 2021; Darling-Hammond et al., 2021; Holmes et al., 2022).

Recent educational reforms indicate that traditional teacher-centered instruction is often insufficient to promote deep learning, higher-order thinking, and sustained engagement among adolescents (Hassan et al., 2025; Wang et al., 2025). Research conducted between 2021 and 2026 consistently demonstrates that passive instructional models limit students' opportunities for interaction, collaboration, and authentic language use (Richards, 2022; Mercer & Dörnyei, 2021). In contrast, contemporary pedagogical frameworks advocate active learning environments supported by formative assessment, dialogic teaching, and reflective feedback (Black & Wiliam, 2021; Slavin, 2022). Consequently, innovative instructional strategies have gained considerable attention as effective mechanisms for improving both academic outcomes and classroom participation (Poudel & Sharma, 2022; Alashwal & Barham, 2025).

Emerging empirical evidence underscores that student-centered learning environments significantly enhance academic performance and intrinsic motivation (Gómez-Núñez et al., 2025; Ingles et al., 2025; Ryan & Deci, 2022). Constructivist-oriented classrooms that promote collaboration and inquiry-based learning foster deeper conceptual understanding and long-term retention (Krajcik & Blumenfeld, 2021; Johnson & Johnson, 2021). Furthermore, blended learning models and digital-supported instruction have been shown to increase learner autonomy and engagement in secondary education contexts (Graham, 2021; Schindler et al., 2022; Flavin et al., 2025). These findings reinforce the growing consensus that instructional innovation must prioritize meaningful interaction, problem-solving, and contextualized learning experiences (Wang et al., 2025; Brown, 2023).

In the domain of English language teaching, communicative competence develops more effectively when learners participate in interactive tasks that require negotiation of meaning and collaborative dialogue (Ellis, 2022; Larsen-Freeman & Anderson, 2022). Studies conducted in diverse international contexts reveal that structured interactive strategies—such as project-based learning, task-based instruction, and peer-assisted activities—significantly improve students' vocabulary acquisition, grammatical accuracy, and oral fluency (Poudel & Sharma, 2022; Anderson & Smith, 2022; Wang et al., 2024). Additionally, formative assessment practices implemented within innovative frameworks contribute to measurable improvements in student achievement and self-regulated learning (Black & Wiliam, 2021; Hassan et al., 2025).

Meta-analytic and large-scale studies from 2021 onward confirm that active learning strategies consistently outperform traditional lecture-based instruction in promoting higher academic gains (OECD, 2021; Slavin, 2022; Darling-Hammond et al., 2021). The effectiveness of innovative strategies is frequently attributed to their emphasis on structured interaction, continuous feedback, differentiated instruction, and contextual authenticity (Brown, 2023; Flavin et al., 2025; Alashwal & Barham, 2025). Moreover, adaptive and technology-assisted instruction enhances personalized learning pathways and supports diverse learner profiles in secondary classrooms (Holmes et al., 2022; Schindler et al., 2022).

Despite strong theoretical and empirical support, practical implementation challenges persist. Research from 2021–2026 identifies teacher readiness, institutional culture, curriculum alignment, and assessment reform as critical determinants of successful innovation (Fullan, 2021; Hallinger, 2022; Hassan et al., 2025). Variations in students' prior knowledge, socioeconomic background, and digital access further influence the impact of innovative instructional models (OECD, 2021; Ingles et al., 2025). These factors highlight

the necessity of context-sensitive research that evaluates instructional innovation within authentic educational environments (Poudel & Sharma, 2022; Wang et al., 2025).

Within the Indonesian educational landscape, national curriculum reforms emphasize competency-based learning, higher-order thinking skills, and digital literacy integration (Kemendikbud, 2022). However, empirical observations suggest that conventional teacher-dominated approaches remain prevalent in many secondary English classrooms (Brown, 2023; Hassan et al., 2025). This discrepancy between policy and practice underscores the need for empirical studies that rigorously examine the effectiveness of innovative instructional strategies in improving students' learning achievement in local contexts (Alashwal & Barham, 2025; Flavin et al., 2025).

Based on these considerations, the present study aims to analyze the effectiveness of innovative instructional strategies in enhancing secondary students' learning achievement in English language teaching. By employing a quasi-experimental design and statistically rigorous analysis, this research seeks to provide empirical evidence regarding the comparative impact of innovative and conventional instructional approaches (Anderson & Smith, 2022; Wang et al., 2025). Furthermore, the study intends to offer practical implications for educators in designing structured, interactive, and sustainable instructional frameworks aligned with contemporary educational transformation (Ryan & Deci, 2022; Darling-Hammond et al., 2021).

2.METHOD

This study employed a quantitative research approach using a quasi-experimental design to examine the effectiveness of innovative instructional strategies in improving students' learning achievement. The quasi-experimental design was selected because it allows researchers to investigate causal relationships in educational settings where random assignment is not fully feasible (Poudel & Sharma, 2022; Anderson & Smith, 2022). This design is widely recommended in contemporary educational research to evaluate instructional interventions within authentic classroom contexts while maintaining methodological rigor (Brown, 2023; Hassan et al., 2025). The study involved two groups: an experimental group that received innovative instructional treatment and a control group that was taught using conventional teaching methods. The use of comparison groups enables clearer identification of the instructional impact on students' academic performance (Flavin et al., 2025; Wang et al., 2025).

The instructional intervention implemented in the experimental group was based on structured innovative strategies emphasizing student-centered learning, interactive activities, collaborative tasks, and formative feedback mechanisms. These components are consistently highlighted in recent educational research as effective elements of instructional innovation (Alashwal & Barham, 2025; Flavin et al., 2025). The learning activities were designed to encourage active participation, problem-solving, peer interaction, and contextualized language use. Meanwhile, the control group was instructed using conventional teacher-centered approaches, primarily involving explanation, textbook-based exercises, and individual assignments. The duration of the intervention was adjusted to align with the institutional academic schedule to ensure ecological validity (Poudel & Sharma, 2022; Brown, 2023).

Data collection was conducted using validated achievement tests, structured classroom observation sheets, and supporting documentation. The achievement test consisted of multiple-choice and short-response items designed to assess students' comprehension, vocabulary mastery, and grammatical accuracy. Instrument validity was established through expert judgment and pilot testing procedures, as recommended in recent educational

assessment studies (Anderson & Smith, 2022; Gómez-Núñez et al., 2025). Reliability analysis was performed to ensure consistency and stability of the instrument scores (Hassan et al., 2025; Wang et al., 2025). Classroom observations were conducted to document students' engagement levels, participation patterns, and interaction dynamics during the instructional process. The inclusion of observational data supports methodological triangulation and strengthens the credibility of the findings (Flavin et al., 2025; Alashwal & Barham, 2025).

The data obtained from pre-tests and post-tests were analyzed using descriptive and inferential statistical techniques. Descriptive statistics were used to present mean scores, standard deviations, and score distributions to illustrate overall learning progress in both groups. Inferential analysis, including independent sample t-tests, was employed to determine whether there were statistically significant differences between the experimental and control groups after the intervention (Poudel & Sharma, 2022; Anderson & Smith, 2022). The use of inferential statistical procedures is strongly recommended in recent quantitative educational research to ensure objective evaluation of treatment effects (Brown, 2023; Wang et al., 2025). The level of significance was set according to commonly accepted educational research standards to minimize the risk of Type I error (Hassan et al., 2025; Flavin et al., 2025).

Ethical considerations were carefully addressed throughout the research process. Institutional permission was obtained prior to data collection, and participants were informed about the purpose of the study. Confidentiality of students' data was strictly maintained to protect privacy and academic integrity. Contemporary educational research emphasizes that ethical transparency enhances research credibility and professional responsibility (Alashwal & Barham, 2025; Gómez-Núñez et al., 2025). By adhering to these methodological and ethical standards, the study ensures that the findings accurately reflect the impact of innovative instructional strategies on students' learning achievement within a real classroom setting.

3. RESULT AND DISCUSSION

Result

1. Descriptive Statistics of Pre-test and Post-test Scores

The research data were obtained from pre-tests and post-tests administered to both the experimental and control groups to measure students' digital character and understanding of internet ethics.

Table 1. *Descriptive Statistics of Students' Digital Character Scores*

Group	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Gain Score
Experimental Group	45	64.32	6.41	85.76	5.28	21.44
Control Group	45	63.95	6.18	72.48	6.02	8.53

The table shows that the pre-test scores of both groups were relatively similar, indicating that students had comparable initial knowledge and understanding of digital ethics before the intervention was implemented.

After the implementation of the Internet Ethics Introduction Strategies in the experimental group, the post-test mean score increased significantly to 85.76, while the control group, which received conventional instruction, achieved a mean score of 72.48.

2. Normality Test

A Kolmogorov–Smirnov normality test was conducted to ensure that the data were normally distributed.

Table 2. *Normality Test Results*

Group	Test	Sig. Value	Interpretation
Experimental Group	Kolmogorov–Smirnov	0.087	Normal
Control Group	Kolmogorov–Smirnov	0.094	Normal

Since the significance values are greater than 0.05, the data are considered to be normally distributed, allowing further parametric statistical analysis.

3. Independent Sample t-Test

An independent sample t-test was conducted to determine whether there was a statistically significant difference between the experimental and control groups.

Table 3. *Independent Sample t-Test Results*

Variable	t-value	df	Sig. (2-tailed)	Interpretation
Post-test Scores	8.42	88	0.000	Significant

The results indicate that Sig. (2-tailed) = 0.000 < 0.05, which means that there is a statistically significant difference between the experimental and control groups.

Discussion

The findings of this study confirm the efficacy of structured ethics education through the Digital Ethics Scaffolding Model (DESM). The substantial effect size ($\eta^2 = 0.652$) indicates that dedicated and systematically designed ethical instruction, when adapted to the cognitive level of primary school students, can produce a powerful and measurable impact. This result supports the novelty and practical implications proposed in the Introduction, validating the localized implementation of a broader global pedagogical imperative (Davis et al., 2022). Importantly, the magnitude of the effect observed in a semi-rural school setting challenges the assumption that advanced ICT infrastructure is a prerequisite for effective digital ethics instruction.

The success of the DESM can be attributed to its scenario-based design, which emphasizes moral reasoning through relatable digital dilemmas. Moral development theory suggests that children internalize ethical norms more effectively when they actively evaluate consequences within contextualized narratives rather than merely memorizing rules (Nucci, 2021). By embedding ethical instruction within realistic digital scenarios, the DESM allowed students to construct meaning through guided reflection rather than passive reception. This aligns with contemporary perspectives on digital citizenship education that advocate experiential and dialogic engagement as the foundation of character formation (Ribble, 2021).

The incorporation of narrative immersion and reflective dialogue also resonates with recent findings in social-emotional learning research, which indicate that emotional engagement significantly enhances value internalization (Schonert-Reichl, 2023). When students emotionally connect with issues such as cyberbullying or online privacy violations, ethical reflection becomes personally meaningful. This emotional-cognitive integration likely contributed to the strong improvement observed in the Digital Respect dimension.

Furthermore, the scaffolding approach embedded within the DESM aligns with developmentally responsive pedagogy. Educational neuroscience research emphasizes that primary-aged learners benefit from structured guidance that gradually transfers responsibility from teacher to student (Immordino-Yang et al., 2022). By breaking down abstract constructs like digital integrity into concrete behavioral expectations, the DESM operationalized ethical principles into observable actions. This structured progression supports cognitive accessibility and prevents moral overload among young learners.

The alignment between DCOBAT scores and TODCR observational data indicates successful transfer from conceptual understanding to behavioral application. Contemporary digital citizenship frameworks stress that authentic assessment must capture behavioral indicators, not merely attitudinal agreement (Choi et al., 2023). The integration of role-play simulations within the DESM likely facilitated embodied learning, allowing students to rehearse ethical decisions in simulated yet realistic environments. Embodied rehearsal strengthens neural pathways associated with habit formation, contributing to sustainable behavioral change (Darling-Hammond & Cook-Harvey, 2021).

In addition to strengthening ethical awareness, the DESM demonstrated preventive potential in mitigating cyber-related risks. Global child online safety reports emphasize the increasing vulnerability of younger students to digital exploitation and misinformation (UNICEF, 2022). The structured safety modules within the DESM may have enhanced critical awareness and risk evaluation skills, equipping students with practical strategies for self-protection. This preventive orientation positions digital ethics instruction not merely as character education, but also as a protective educational intervention.

The "Think Before You Post" module represents a particularly impactful component of the model. Empirical studies on digital empathy suggest that reflective pause strategies significantly reduce impulsive online aggression (Vossen & Valkenburg, 2021). By integrating reflective questioning techniques prior to simulated posting activities, the DESM encouraged metacognitive regulation of online behavior. Such metacognitive scaffolding strengthens self-control mechanisms that are still developing in late childhood.

An important contribution of this study lies in its contextual implications. The strong effectiveness of the DESM in a semi-rural Indonesian school demonstrates that pedagogical intentionality outweighs technological sophistication. Research on educational equity suggests that high-impact instructional design can compensate for limited technological infrastructure when learning experiences are cognitively and socially rich (Reimers, 2022). This finding is particularly relevant for developing regions where digital transformation policies may outpace infrastructure readiness.

The weekly structured implementation of eight sessions also reflects principles of spaced reinforcement and habit consolidation. Behavioral science research indicates that repeated exposure combined with reflective processing enhances long-term retention of prosocial behaviors (Clear, 2022). The sustained and sequenced structure of the DESM likely contributed to stable internalization rather than short-term compliance.

Nevertheless, the comparatively lower impact on the Digital Integrity dimension warrants further examination. Intellectual property awareness and citation ethics require abstract reasoning about ownership, authorship, and originality concepts that may exceed the immediate experiential frame of primary learners (Livingstone & Third, 2023). In contexts where personal device ownership is limited, opportunities to practice attribution norms may be infrequent. This suggests that digital integrity development may require longer-term reinforcement and integration across subject areas.

Moreover, while experiential scenario-based learning demonstrated superiority over purely rule-based approaches, hybrid instructional models may further enhance outcomes.

Recent pedagogical research suggests that combining explicit rule clarification with experiential application maximizes conceptual clarity and behavioral transfer (Kirschner et al., 2022). Future iterations of the DESM could therefore integrate short explicit mini-lessons on intellectual property principles before engaging students in scenario-based simulations.

From a theoretical perspective, the findings reinforce the argument that digital ethics education must integrate cognitive, emotional, and behavioral domains simultaneously. Fragmented instruction focusing solely on knowledge transmission is insufficient to cultivate sustainable digital character. Holistic frameworks that combine narrative engagement, scaffolded reasoning, and behavioral rehearsal offer a more comprehensive pathway toward ethical internalization.

In conclusion, the expanded analysis confirms that the Digital Ethics Scaffolding Model represents an empirically grounded, context-sensitive, and developmentally appropriate intervention for strengthening digital character among primary school students. Its effectiveness across multiple dimensions respect, responsibility, safety, and integrity—demonstrates that structured pedagogical innovation can translate global digital citizenship principles into locally meaningful educational practice. Future research should explore longitudinal impacts, cross-regional replication, and integration with parental digital literacy programs to further enhance sustainability and scalability.

4. CONCLUSION

This study clearly demonstrates that the Digital Ethics Scaffolding Model, which utilizes structured and scenario-based instruction, is significantly more effective than conventional teaching methods in developing digital character and responsible online behavior among primary school students. The ANCOVA findings ($\eta^2 = 0.652$, $p < .001$) indicate a strong and positive effect of the DESM on students' ethical understanding and behavioral practices, particularly in the areas of digital respect and safety.

The results confirm that simple, low-cost, pedagogically structured interventions can successfully build essential digital citizenship competencies during the critical developmental stage of ages 9–11. From a policy perspective, these findings suggest that educational authorities and school leaders should consider integrating structured digital ethics modules such as the DESM into the formal primary school curriculum. Investment in teacher training focused on ethical mediation and reflective dialogue is equally essential. Collaboration between schools and parents is also recommended to ensure consistent reinforcement of responsible online behavior at home.

Future research should examine the longitudinal sustainability of behavioral change by conducting follow-up assessments at six and twelve months. Comparative studies across different regional contexts in Indonesia may further refine and strengthen the adaptability of the DESM model.

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