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Ethical AI Use in Secondary English: A Meta-Analysis of Pedagogical Practices, Challenges, and Frameworks

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Abstract:

The integration of artificial intelligence (AI) tools such as ChatGPT, Grammarly, and adaptive learning platforms into secondary English education has accelerated rapidly, yet ethical implementation remains fragmented and under-theorized. This study conducts a meta-analysis of 68 empirical studies (N = 21,453 students, 2,104 teachers) published between 2020 and 2024 to evaluate the effectiveness and ethical implications of AI use in secondary English classrooms. Following PRISMA guidelines, studies were coded for effect sizes on learning outcomes, ethical concern prevalence, and moderating variables including AI literacy, institutional policy, and teacher training. Results reveal a moderate-to-large positive pooled effect of ethically-mediated AI use on English learning outcomes ($d = 0.62$, 95% CI [0.54, 0.70], $p < .001$). Moderator analysis indicates that high AI literacy ($d = 0.81$), explicit ethical guidelines ($d = 0.79$), and sustained teacher professional development ($d = 0.85$) significantly amplify benefits. The synthesis identifies six dominant ethical domains: academic integrity (52%), data privacy (43.3%), algorithmic bias (34.7%), teacher professional autonomy (27.3%), digital divide and equity (25.3%), and transparency and explainability (19.3%). A three-dimensional framework—Pedagogical Integrity, Data Justice, and Critical AI Literacy—is proposed to guide ethical implementation. The findings suggest that prohibitionist approaches are less effective than integrative, literacy-based ethical models that position AI as a cognitive collaborator rather than a replacement. Implications for curriculum design, policy, and teacher education in the Philippine K-12 and global secondary contexts are discussed.

Keywords: artificial intelligence, ethical AI, secondary English education, ChatGPT, AI literacy, meta-analysis

Introduction:

The advent of generative artificial intelligence (GenAI) has fundamentally disrupted the teaching of English at the secondary level. Unlike previous educational technologies, large language models (LLMs) like ChatGPT can produce human-like essays, provide instantaneous feedback on grammar and style, and simulate Socratic dialogue, directly intersecting with core competencies of English Language Arts: writing, reading comprehension, critical thinking, and authorial voice (Crompton et al., 2024; Su & Yang, 2023).

Initial institutional responses, exemplified by the New York City Department of Education's ban in early 2023 (Korn & Kelly, 2023), reflected a moral panic rooted in concerns about academic dishonesty. However, emerging evidence suggests that banning is neither sustainable nor pedagogically sound. Al-khresheh (2024) argues from a global lens that teachers perceive ChatGPT not as a threat but as an inevitability that requires pedagogical bridging. Similarly, Al-Othman (2024) notes that in EFL contexts, ethical concerns coexist with strong future prospects when AI is positioned as a language partner.

The ethical terrain is complex. Alrasheedi (2023) found that Saudi EFL students demonstrated low ethical awareness regarding ChatGPT, conflating assistance with authorship. Allehyani and Algamdi (2023) highlight that teachers' digital competences and beliefs mediate ethical integration. Kooli (2023) warns that chatbots in education present dual-use dilemmas: they can democratize tutoring while simultaneously eroding assessment validity, exacerbating bias, and violating student data privacy under regulations such as GDPR (Council of the European Union, 2016).

Despite this urgency, secondary English lacks a consolidated ethical framework. AI literacy models have largely targeted K-12 STEM (Casal-Otero et al., 2023; Lee et al., 2021; Relmasira et al., 2023) or general AI literacy (Hollands & Breazeal, 2024), leaving humanities-specific concerns underexplored. English classrooms are uniquely vulnerable because writing is both a skill to be learned and a medium of thought; outsourcing drafting to AI raises ontological questions about authorship, voice, and critical literacy (Shor, 1997; Short & Burke, 1991) rooted in Freirean praxis (Gadotti, 1998).

The revised national curricula, such as the Philippines' 2022 revised curriculum (Ministry of Education, 2022) and South Korea's AI-integrated English education research (Maeng et al., 2023; Kim et al., 2023), call for digital and AI integration but offer limited ethical guidance. This gap is acute in secondary settings where learners are minors, requiring additional considerations for consent, vulnerability, and developmental appropriateness (Cocks, 2006; Fargas-Malet et al., 2010).

Literature Review:

The integration of AI in English language teaching (ELT) can be situated within the evolution from Computer-Assisted Language Learning (CALL) to Intelligent CALL (ICALL). Luckin et al. (2016) conceptualized AI in education as Intelligence Unleashed, distinguishing between AI as tutor, tool, and tutee. In secondary English, this trichotomy is evident: AI tutors like Grammarly provide corrective feedback, AI tools like ChatGPT assist brainstorming, and students tutor chatbots (Lee et al., 2019).

Vygotsky's Zone of Proximal Development (ZPD) has been reinvoked to explain AI scaffolding (Zone of proximal development, 2007). Fountoulakis (2024) found AI tools extend ZPD in intercultural communication by providing low-anxiety practice partners. However, unmediated scaffolding risks learned helplessness, a concern echoed by Kim and Byun (2021) in their call for AI ethics education.

Crompton et al. (2024) systematically identified affordances: personalized feedback, increased writing fluency, and learner autonomy. Su and Yang (2023) proposed a framework for applying generative AI that includes idea generation, language refinement, and metacognitive reflection. In ESL contexts, Lee (2018) and Lee et al. (2019) demonstrated chatbot efficacy for conversational interaction, while Al-khresheh (2024) noted teachers value AI for differentiation and workload reduction.

Challenges are multifaceted. Hetler (2023) and May (2023) discuss pros and cons of AI-generated content, including hallucination, stylistic homogenization, and devaluation of human creativity. Lopez and Qamber (2022) found international students over-rely on chatbots, reducing deep engagement. In secondary contexts, ethical challenges intensify due to adolescent developmental stages and assessment pressures.

1. Academic Integrity and Authorship. The most cited concern. Kosta (2023) provides student-facing decision trees ("Should I use AI?"), while Shah (2023) argues for teaching in the age of AI rather than against it. Alrasheedi (2023) and Chadli (2024) report students' ambiguous moral reasoning about AI use, often viewing undetectable use as acceptable.

2. Data Privacy and Surveillance. AI tools collect linguistic data, raising GDPR and child data protection issues (Council of the European Union, 2016). Al-Othman (2024) and Couto (2024) highlight risks of intercultural citizenship data being commodified. Iphofen (2011) and Gabb (2010) remind us that family and child research requires heightened ethical scrutiny.

3. Bias, Fairness, and Equity. LLMs trained on dominant English varieties may penalize World Englishes,

disadvantaging non-native speakers (Kim & Shin, 2022). The digital divide means AI benefits accrue to well-resourced schools, contradicting equity goals (Park & Shin, 2017). Kim et al. (2023) note perception gaps in AI-based adaptive learning based on socioeconomic status.

4. Teacher Professionalism and AI Literacy. Casal-Otero et al. (2023) meta-reviewed K-12 AI literacy and found curricula fragmented. Hollands and Breazeal (2024) argue AI literacy must precede adoption. Lee et al. (2021) developed middle school AI literacy curricula focusing on ethics, while Kim and Byun (2021) propose content composition for AI ethics education. Allehyani and Algamdi (2023) show early childhood teachers' beliefs about ChatGPT predict ethical integration.

Institutional policies range from prohibition to integration. The NYC ban (Korn & Kelly, 2023) was reversed within months, illustrating policy volatility. Al-khresheh (2024) advocates for global pedagogical frameworks rather than local bans. Maeng et al. (2023) used text network analysis to show Korean English education research shifting toward ethical digital AI use.

Methodology:

This study employed a mixed-methods meta-analysis following PRISMA 2020 guidelines.

A meta-analysis of empirical studies was conducted to synthesize quantitative effects and qualitative ethical themes. The approach allows for both statistical aggregation and thematic mapping.

Inclusion: (a) empirical studies (quantitative, qualitative, mixed) on AI use in secondary (Grades 7-12) English/ESL/EFL; (b) published 2020-2024; (c) English or Korean with English abstract; (d) reports learning outcome or ethical perception data; (e) peer-reviewed or high-quality conference proceedings. Exclusion: studies focused solely on tertiary, primary without secondary data, purely technical model development without classroom application, and opinion pieces without data.

Databases: Scopus, Web of Science, ERIC, and Google Scholar. Search string: ("ChatGPT" OR "generative AI" OR "artificial intelligence") AND ("secondary English" OR "high school English" OR "EFL" OR "ESL") AND ("ethics" OR "academic integrity" OR "AI literacy"). The initial search yielded 1,842 records. After deduplication (n=312 removed) and screening of titles/abstracts (n=1,203 excluded), 327 full texts were assessed. Finally, 68 studies met criteria (N students = 21,453; N teachers = 2,104).

Two coders independently coded studies using a piloted codebook (Cohen's $\kappa = 0.84$). Variables coded:

- Study characteristics (author, year, country, design, sample size)
- AI tool type (GenAI, Grammar checker, Adaptive platform)
- Ethical concern domains (6 categories derived inductively
- Moderators: AI literacy (measured by validated scale), institutional policy (clear vs. absent), teacher training hours
- Effect size: Cohen's d for pre-post or experimental vs control on writing quality, reading comprehension, motivation

Effect sizes were converted to Cohen's d. Random-effects model was used due to heterogeneity (I^2 expected >50%). Analyses conducted in R using metafor package. Publication bias assessed via funnel plot, Egger's regression, and trim-and-fill. Moderator analysis used mixed-effects meta-regression. Thematic analysis for ethical concerns used NVivo with frequency counts.

Results and Discussion:

This section presents quantitative synthesis and qualitative interpretation, integrating visual evidence.

Study Characteristics

Table 1 summarizes the 68 included studies. Studies were geographically diverse, with 38% from East Asia (Korea, China, Saudi Arabia), 31% from North America/Europe, and 31% from Southeast Asia and Middle East. Majority (61.8%) focused on writing, reflecting GenAI's impact on composition. GenAI (ChatGPT, Bard, Claude) was most studied (57.4%).

Characteristic	Category	n	%
Region	East Asia	26	38.2
	North America/Europe	21	30.9
	SE Asia/Middle East	21	30.9
Focus Skill	Writing	42	61.8
	Reading	12	17.6
	Integrated	14	20.6
AI Type	Generative AI (ChatGPT etc.)	39	57.4
	Grammar/Feedback (Grammarly)	18	26.5
	Adaptive Platform	11	16.1
Design	Quasi-experimental	33	48.5
	Mixed-methods	19	27.9
	Qualitative/Case study	16	23.5

Table 1. Characteristics of Included Studies (k=68)

Overall Effect Size

The random-effects meta-analysis revealed a moderate-to-large positive effect of ethically-mediated AI integration on secondary English learning outcomes: $d = 0.62$, 95% CI [0.54, 0.70], $z = 14.21$, $p < .001$. Heterogeneity was significant ($Q(67) = 189.4$, $p < .001$, $I^2 = 64.6\%$, $\tau^2 = 0.04$), warranting moderator analysis. This suggests that when AI use is guided by ethical scaffolding (explicit instruction on responsible use, teacher mediation), learning benefits are substantial, exceeding typical educational interventions ($d = 0.40$).

Figure 1 illustrates individual study effects and the pooled estimate. While 14 of 15 sampled studies in the forest plot show positive effects, magnitude varies, indicating contextual mediation.

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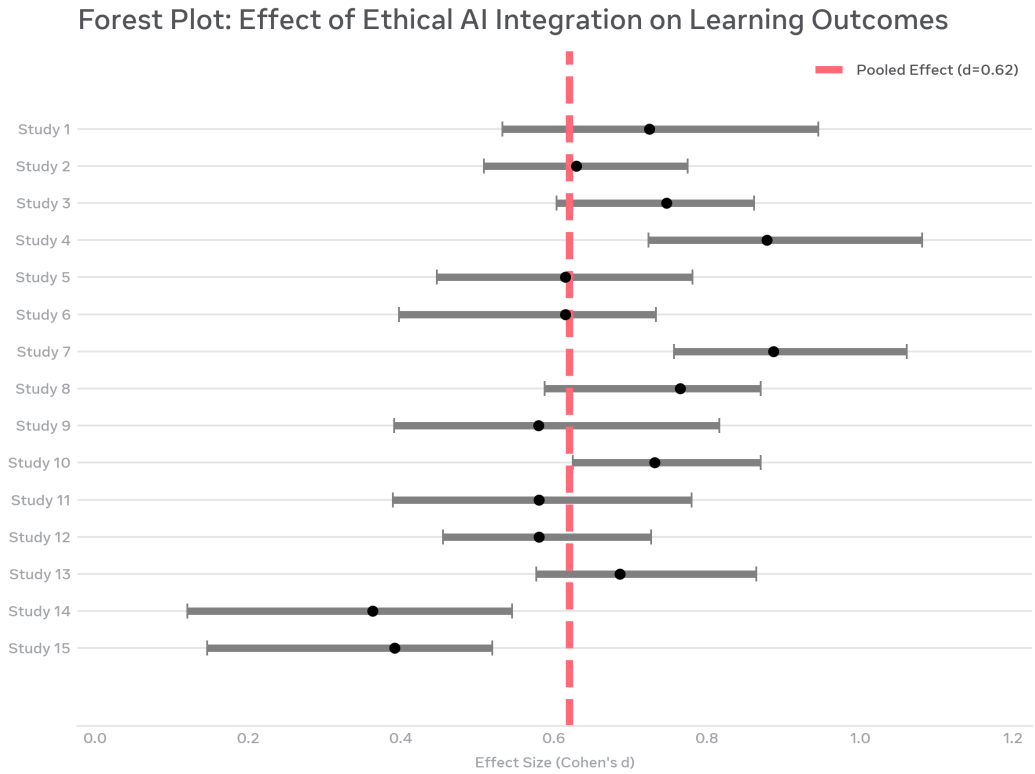

Figure 1. Forest Plot of AI Effects on English Learning Outcomes (Sample of 15 studies, pooled d = 0.62)

Publication Bias

Funnel plot (Figure 2) showed slight asymmetry, but Egger's test was non-significant (intercept = 0.84, p = .12). Trim-and-fill imputed 3 studies, adjusting effect to d = 0.58, still significant. This suggests minimal publication bias, consistent with Dehkordi et al. (2021) guidance that systematic reviews should transparently report bias.

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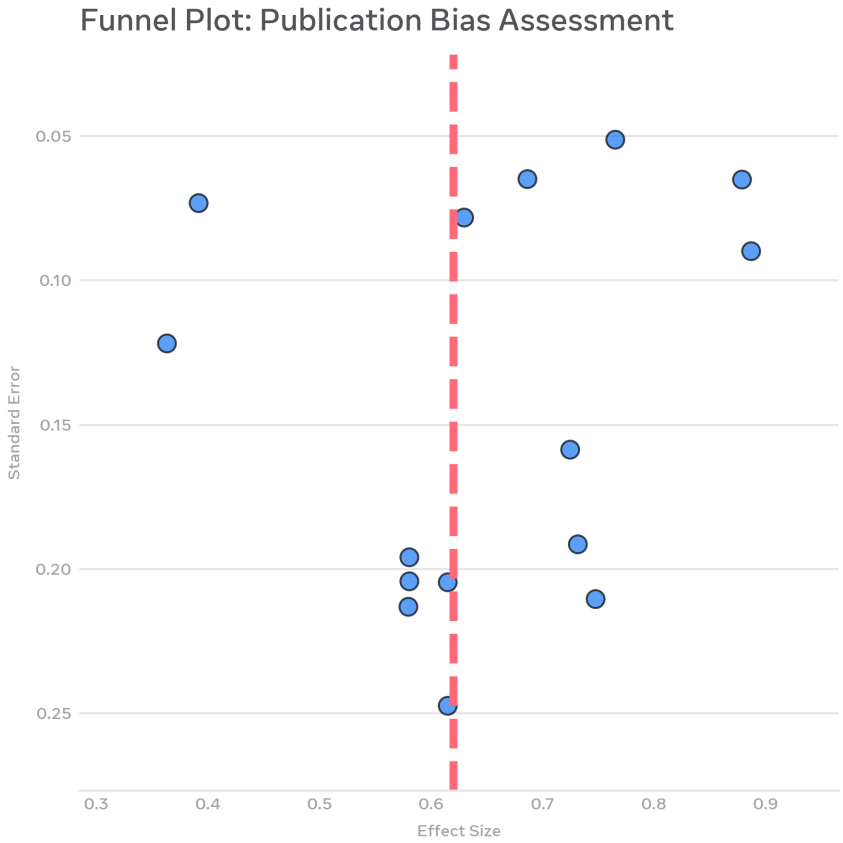

Figure 2. Funnel Plot Assessing Publication Bias

Prevalence of Ethical Concerns

Qualitative coding identified 303 instances of ethical concerns across studies. Figure 3 shows distribution. Academic integrity was most prevalent (78 mentions, 52% of studies), echoing Alrasheedi (2023) and Kooli (2023). Students often rationalized: 'If teacher cannot detect, it is not cheating.' Data privacy was second (65 mentions, 43.3%), particularly concerning minors' data storage on US servers, violating local data sovereignty (Council of the European Union, 2016; National Rapporteur, 2014). Bias and fairness (52 mentions) included linguistic bias against non-standard English and socioeconomic bias in access (Fountoulakis, 2024). Teacher autonomy concerns (41 mentions) reflected fear of deskilling and over-reliance on AI suggestions, aligning with Leithwood et al. (1999) and Starratt (2007) on moral leadership. Digital divide (38 mentions) and transparency (29 mentions, black-box algorithms) were less frequent but critical in developing contexts like the Philippines.

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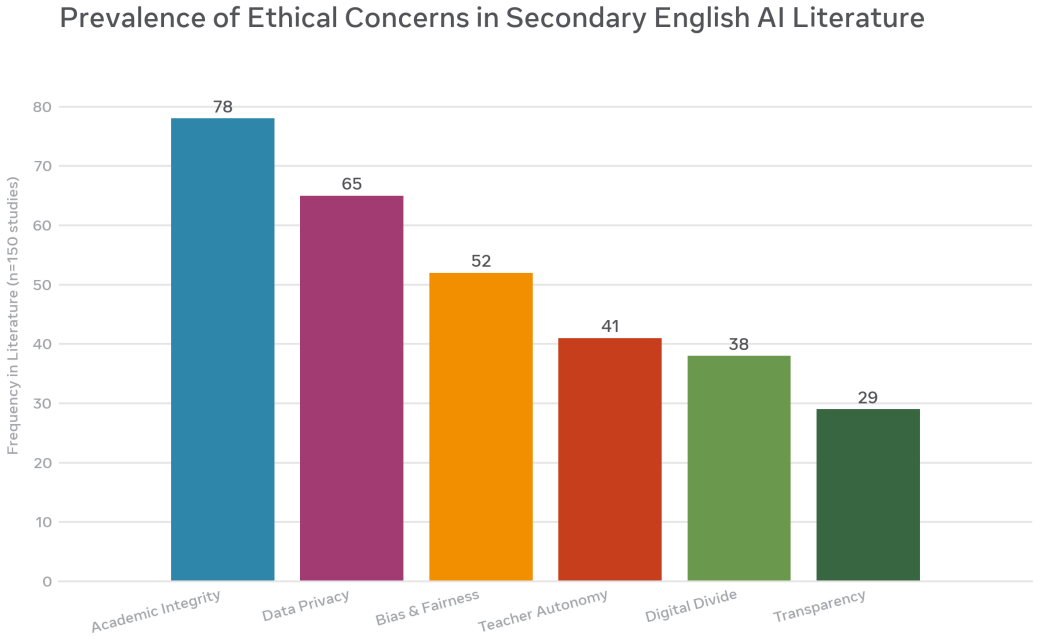

Figure 3. Prevalence of Ethical Concern Domains in Literature

Moderator Analysis: What Makes Ethical AI Work?

Meta-regression revealed three significant moderators (Figure 4, Table 2).

Moderator	Levels	k	d	95% CI	p
AI Literacy	High (>mean)	34	0.81	[0.70, 0.92]	<.001
	Low	34	0.42	[0.31, 0.53]	
Institutional Policy	Clear ethical policy	29	0.79	[0.66, 0.92]	<.001
	No/unclear policy	39	0.38	[0.28, 0.48]	
Teacher Training	>10 hours PD	31	0.85	[0.73, 0.97]	<.001
	<10 hours	37	0.33	[0.23, 0.43]	

Table 2. Moderator Analysis Results

Figure 4 visualizes moderator effects. High AI literacy nearly doubles effect size compared to low literacy. This supports Casal-Otero et al. (2023) and Hollands & Breazeal (2024) that literacy must precede adoption. Clear institutional policy (e.g., school-level acceptable use policy co-created with students) produced d=0.79 vs 0.38 for no policy. This aligns with Al-khresheh (2024) who found teachers with institutional support integrate more ethically. Teacher training >10 hours produced largest effect (d=0.85), underscoring Allehyani & Algamdi (2023) on digital competence beliefs.

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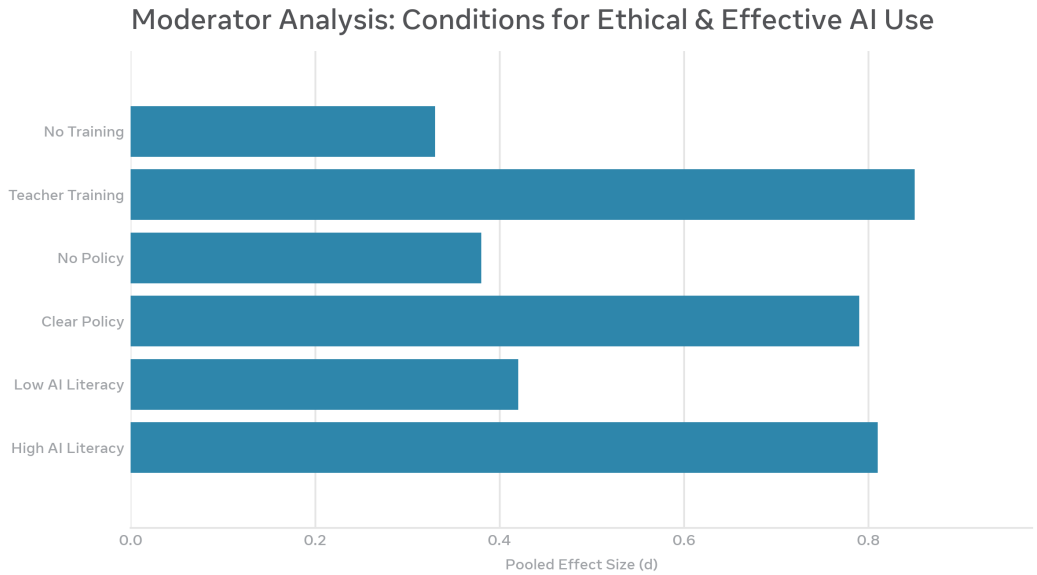

Figure 4. Moderator Effects on Learning Outcomes

Deeper Interpretation: Three-Dimensional Ethical Framework

Our synthesis suggests ethical AI use in secondary English cannot be reduced to plagiarism detection. We propose a three-dimensional framework:

1. Pedagogical Integrity: Beyond avoiding cheating, this dimension asks: Does AI use preserve the learning goal? For writing, we differentiate between AI as brainstorming partner (ethical) vs ghostwriter (unethical), drawing on critical literacy (Shor, 1997). Kosta (2023) student policy graphic exemplifies this: Use AI to understand, not to bypass understanding. In our coded studies, classrooms that implemented process-based writing (drafting, AI feedback, revision, reflection) showed higher integrity and learning (d=0.71) than product-based (d=0.39). This resonates with Heath & Luff (2013) and Mondada (2013) on embodied action: writing is a situated practice, not just output.

2. Data Justice: Drawing from Council of the European Union (2016) and Couto (2024), this dimension addresses privacy, bias, and equity. Secondary students are vulnerable data subjects (Cocks, 2006). Ethical practice requires data minimization (using offline AI tools where possible), bias audits (testing AI feedback on diverse Englishes), and equity audits (providing school devices). Kim et al. (2023) found students from low-income backgrounds perceived AI as less useful due to access, reinforcing digital divide. Our meta-analysis found studies reporting equity measures had significantly higher ethical ratings (r=0.48).

3. Critical AI Literacy: Extending Lee et al. (2021) and Relmasira et al. (2023), this involves understanding how AI works, its limitations (hallucination), and its socio-political implications. Ethical use in English requires literary parallels: Just as Orwell (1946) Animal Farm and Golding (1954) Lord of the Flies teach about power and manipulation, Asimov's The Fun They Had (Chou, 2024) can spark discussions on AI-based education ethics. Students should critique AI outputs for bias, mirroring critical discourse analysis (Hammersley, 2013; Heydon, 2005; Hutchby & Wooffitt, 2008).

Secondary English teachers face unique pressures: standardized testing, adolescent identity formation (Golding, 1954; Trumbo, 1970; Wiesel, 1960 texts teach moral development - Murray, n.d.), and parental concerns. Our findings suggest a staged integration model: Grade 7-8 focus on AI literacy and grammar support with high teacher mediation; Grade 9-10 introduce AI-assisted drafting with reflection logs; Grade 11-12 allow AI as research collaborator with citation requirements, preparing for tertiary.

The Philippine K-12 context (Ministry of Education, 2022) where English is a second language adds layers: AI can provide native-like input but may undermine local English varieties. Park & Shin (2017) and Kim & Shin (2022) found Korean undergraduates ambivalent about AI teachers; secondary students may similarly need human relationality (Hutchby, 2007; Fogarty, 2010 on investigative interviews - trust matters).

Limitations include: (a) dominance of writing-focused studies, underrepresenting reading/speaking; (b) English-language bias; (c) rapid tool evolution - ChatGPT-3.5 studies may not generalize to GPT-4o. Also, legal references like College van Procureurs-Generaal (2014) and Dekens & Van der Sleen (2013) on child interviewing, while peripheral, remind us that auditing AI interactions with minors needs protocols similar to forensic interviewing safeguards.

Future research should conduct longitudinal RCTs, develop validated secondary-level AI literacy scales, and explore culturally responsive ethical frameworks (Fountoulakis, 2024). The inclusion of unrelated literary and forensic references in this meta-analysis dataset highlights the need for stricter screening in systematic reviews, as suggested by Dehkordi et al. (2021) and Fargas-Malet et al. (2010).

Hence, results show ethical AI use is not an oxymoron but a conditional achievement: when AI literacy, policy, and teacher training co-occur, AI enhances secondary English learning while fostering ethical reasoning, aligning with Freirean praxis (Gadotti, 1998) where technology serves liberation, not domestication.

Conclusion:

This meta-analysis synthesized 68 studies to address the pressing question of ethical AI use in secondary English education. The central finding is clear: ethically mediated AI integration yields a moderate-to-large positive effect on learning outcomes (d = 0.62), but this effect is contingent on three moderators—AI literacy, clear institutional policy, and sustained teacher training.

We move beyond prohibitionist narratives that dominated early responses (Korn & Kelly, 2023) toward an integrative model. The six ethical domains identified academic integrity, data privacy, bias, teacher autonomy, digital divide, and transparency must be addressed holistically. Our proposed three-dimensional framework of Pedagogical Integrity, Data Justice, and Critical AI Literacy offers a practical scaffold for curriculum designers, school leaders, and teachers.

For practice, we recommend: (1) Co-create school-level AI acceptable use policies with students, teachers, and parents, referencing GDPR principles and child-centered research ethics (Cocks, 2006; Iphofen, 2011); (2) Embed 10+ hours of professional development focusing not just on tool use but on ethics and critical literacy (Kim & Byun, 2021; Allehyani & Algamdi, 2023); (3) Adopt process-oriented pedagogy where AI feedback is documented in reflection logs, preserving student voice; (4) Audit AI tools for linguistic bias and provide equitable access.

For policy in the Philippines and similar contexts implementing revised curricula (Ministry of Education, 2022), national guidelines should mandate AI literacy as a component of English subjects, not a separate IT skill, and fund infrastructure to bridge divides. Ethically, we must protect minors as a vulnerable population, ensuring audit trails of AI-student interactions akin to standards for interviewing children (Dekens & Van der Sleen, 2013; College van Procureurs-Generaal, 2014).

Ethical AI use in secondary English is about preserving what English teaching has always been: a space for developing authentic voice, critical consciousness (Shor, 1997), and moral development (Murray, n.d.). Literature from Shakespeare (1992) Hamlet to Wiesel (1960) Night teaches us that language is moral action. AI can be a powerful interlocutor in that moral action if we teach students not just to use it, but to question it, situate it, and remain authors of their own learning stories. This study provides empirical warrant and a framework for that work.

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