

Evaluating the Influence of Artificial Intelligence on Students' Writing Proficiency in English Composition: Implications for Educational Technology & Social Studies Education.

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ABSTRACT

The increasing adoption of artificial intelligence (AI) in education has significantly influenced students' approaches to English composition. This study evaluated the influence of AI on students' writing proficiency in English composition and examined its implications for educational technology and social studies education in Lagos State Senior Secondary Schools. The study adopts descriptive survey research design. The study involved 200 Senior Secondary School students selected through a multistage sampling technique. Data were collected using a structured questionnaire and an English Composition Writing Test and analysed using descriptive and inferential statistics at the 0.05 level of significance. The findings indicated that AI positively influenced students' grammar, vocabulary, organisation, and coherence in writing but raised concerns about overdependence and reduced originality. The study further revealed that the effective integration of AI into educational technology can enhance writing instruction, while social studies education can promote ethical AI use, digital citizenship, and critical thinking. The study concluded that AI is a valuable instructional tool when used responsibly and recommended that teachers integrate AI into English language instruction with appropriate pedagogical and ethical guidelines to improve students' writing proficiency.

Keywords: Artificial intelligence, Educational technology, English composition, Social studies education. Students writing proficiency

INTRODUCTION

English has established itself as the undisputed global lingua franca in the contemporary world, serving as the primary vehicle for international diplomacy, trade, scientific research, technological innovation, higher education, media, and digital communication. In an era dominated by globalization and the internet where the majority of online content, software interfaces, academic journals, and artificial intelligence systems operate in English proficiency in the language is no longer a luxury but a fundamental requirement for meaningful participation in global society (Kasneci et al., 2023). This reality is especially pronounced in multilingual nations like Nigeria, where English functions as the official language, the medium of instruction from upper primary through tertiary education, and a unifying tool in a country with over 500 indigenous languages. As the language of government administration, the judiciary, business transactions, national examinations (such as WAEC and NECO), and international interactions, mastery of English enables socioeconomic mobility, fosters national integration, and equips individuals to access global knowledge economies. Despite these critical roles,

many Nigerian secondary school students continue to grapple with achieving functional proficiency, particularly in productive skills, due to factors such as uneven exposure to quality instruction, linguistic interference from mother tongues, and resource constraints in public schools

Among the four core language skills listening, speaking, reading, and writing; writing in English composition emerges as particularly indispensable for academic achievement, professional success, and intellectual development. Writing empowers learners to organize complex thoughts, construct evidence-based arguments, synthesize diverse information, express nuanced ideas persuasively, and contribute to knowledge creation. In secondary education, strong writing proficiency is essential not only for excelling in subject-specific essays, reports, and examinations like the West African Senior School Certificate Examination (WASSCE), but also for developing transferable higher-order cognitive skills such as analysis, evaluation, inference, and logical reasoning. These abilities extend beyond English classrooms, supporting success across disciplines and preparing students for tertiary studies, employment, and civic engagement in an information-saturated society. However, writing remains one of the most demanding and anxiety-provoking skills for secondary learners worldwide, and especially in Nigerian contexts. It requires a sophisticated integration of linguistic competence (grammar, vocabulary, mechanics), cognitive processes (idea generation, organization, coherence), and metacognitive awareness (self-monitoring, revision). Students frequently encounter obstacles including limited vocabulary, grammatical inaccuracies, structural weaknesses, poor idea development, inadequate reading comprehension (which strongly underpins writing quality), writer's block, and motivational deficits. These challenges are intensified in Nigeria by systemic issues such as overcrowded classrooms, insufficient instructional time, limited access to reading materials, large teacher-student ratios, and socioeconomic disparities affecting home support, and varying levels of prior language exposure. Consequently, many students produce superficial, error-laden, or unoriginal compositions, leading to underperformance in examinations, diminished confidence, and restricted future opportunities. Addressing these writing difficulties is thus vital for holistic educational progress and equitable human capital development (Rahman & Watanobe, 2023; Maharani, 2018; Kasneci et al., 2023)

Artificial intelligence (AI) has become an integral component of contemporary education, transforming the way students learn and complete academic tasks. The integration of AI-powered writing tools into English language instruction has provided learners with opportunities to improve grammar, vocabulary, sentence structure, and overall writing quality (Holmes et al., 2022). Olomu & Ariyibi (2026) reiterated that nevertheless, the benefits of AI integration are tempered by persistent structural and ethical barriers. Their findings identified technical challenges, limited access, cost constraints, and inadequate understanding as major obstacles, all of which were similarly evident within general users' context. These technologies have enhanced access to personalised learning experiences and immediate feedback, making them valuable tools within educational technology. English composition is a fundamental aspect of language learning because it develops students' ability to communicate ideas clearly, logically, and creatively. Although AI writing tools can improve writing proficiency, there are growing concerns that excessive dependence on such technologies may limit students' originality, critical thinking, and independent writing abilities (Kasneci et al., 2023). This raises important questions about the extent to which AI contributes to or hinders the development of writing proficiency among students. From the perspective of educational technology, AI represents an innovative instructional resource that can enhance teaching and learning when integrated appropriately (UNESCO, 2023). Its adoption, however, requires careful consideration of pedagogical and ethical issues to ensure that technology complements rather than replaces students' cognitive engagement.

The study is equally significant to social studies education because the discipline promotes critical thinking, effective communication, digital literacy, and responsible citizenship. As AI becomes increasingly embedded in society, students need the knowledge and skills to use these technologies ethically and responsibly in academic and social contexts (UNESCO, 2023). Evaluating the influence of AI on students' writing proficiency will therefore provide evidence that can guide educators, curriculum developers, and policymakers in promoting effective AI integration while strengthening learners' communication and digital citizenship skills.

This study is therefore seeks to empirically examine the influence of AI writing tools on originality and critical thinking skills in English composition and how it influence educational technology and social studies instruction among secondary school students in Nigeria. While global literature has begun exploring AI's role

in higher education focusing on performance gains, feedback quality, or risks like reduced independence systematic investigations at the secondary level remain limited, particularly in African and Nigerian contexts characterized by multilingualism, infrastructural challenges, rapid digital adoption, high-stakes examinations, and growing but uneven access to technology. Existing research often overlooks cognitive developmental impacts during formative adolescent years, ethical concerns (e.g., authenticity, plagiarism, equity), pedagogical integration strategies, or long-term effects on independent skill acquisition.

Research questions

To what extent do AI writing tools as educational technologies influence English compositions produced by senior secondary school students, and what are the implications for Social Studies Education?

What effect do AI writing tools have on the critical thinking skills demonstrated by senior secondary school students in English composition tasks, Educational Technology and Social Studies Education?

What are the key challenges associated with the use of AI writing tools in relation to English composition proficiency Educational Technology and Social Studies Education?

Significance of the Study

This study is significant because it addresses a growing concern in contemporary education regarding the impact of artificial intelligence (AI) writing tools on students' learning outcomes, particularly originality and critical thinking in English composition. As AI-powered writing applications become increasingly accessible to students, there is an urgent need for empirical evidence to guide educators and institutions on how these tools influence core academic skills that English language education seeks to develop. By examining these effects, the study contributes to informed decision-making on the responsible integration of AI technologies into writing instruction. The findings of this study will be of considerable benefit to English language teachers, education technology teacher and social studies teachers by providing practical insights into how students' use of AI writing tools affects their writing processes and outcomes.

LITERATURE REVIEW

Originality

Originality in English composition, particularly at the senior secondary school level, represents a core intellectual virtue that distinguishes authentic student work from mere reproduction or imitation. Conceptual studies define originality as the capacity to produce novel, valuable, and personally invested ideas within written text, emphasizing the creation of unique perspectives, arguments, or expressions that extend beyond existing sources or common patterns (Glăveanu, 2020). This concept goes beyond superficial novelty to encompass meaningful contribution to thought, where the writer demonstrates independent reasoning, creative insight, and a distinctive voice that reflects genuine engagement with the topic. In academic contexts, originality is not about inventing entirely new knowledge but about adding a specific, useful layer to what has come before through fresh interpretations, innovative connections between ideas, or personal application of concepts in ways that feel authentic to the learner (Toronto Metropolitan University Pressbooks, n.d.).

In the realm of English composition education, originality manifests through several observable dimensions. Idea generation stands as a primary indicator, where students produce concepts, theses, or supporting points that diverge from standard responses and reflect creative problem-solving or insightful observation. Personal voice emerges as another key dimension, characterized by distinctive tone, rhetorical choices, and stylistic flair that convey the writer's unique perspective rather than a neutral or formulaic presentation. Argumentative innovation appears in the construction of logical yet unconventional pathways, such as linking disparate evidence in surprising ways or challenging assumptions with reasoned alternatives. Expressive creativity involves vivid imagery, metaphorical language, or narrative techniques that enrich the composition and make it memorable, while intellectual ownership ensures the work feels self-generated, with the student able to explain and defend choices as their own (Wang, 2020).

Measurement of originality in student essays relies on structured rubrics that operationalize these dimensions into assessable criteria. Rubrics typically employ rating scales that range from limited or absent originality to exceptional levels of novelty and insight. For instance, low originality might be indicated by heavy reliance on generic phrasing, obvious imitation of sources, or predictable organization that lacks personal inflection. Moderate originality could show some unique connections or voice but remain constrained by conventional patterns. High originality is evidenced by fresh ideas, sophisticated synthesis, distinctive expression, and a clear sense of authorial presence that elevates the work beyond standard expectations. Without originality, writing risks becoming mechanical reproduction, limiting opportunities for cognitive growth and authentic expression (Hargrove, 2013).

Challenges to conceptualizing originality arise in contemporary contexts, particularly with the integration of digital tools that can generate text rapidly and fluently. When students encounter pre-formulated ideas or structures, the boundary between inspiration and derivation blurs, raising questions about what constitutes truly original work. Conceptual studies stress that originality remains tied to human agency the deliberate selection, adaptation, and transformation of inputs into something that reflects individual cognition rather than automated output (Howard, 1995; Moore Howard, 1995). This human-centered view insists that even when drawing from external sources or aids, the writer's reflective process and unique synthesis preserve originality (Lubart et al., 2015; Besançon & Lubart, 2015).

Critical Thinking skills

Critical thinking in English composition, especially at the senior secondary school level, constitutes a foundational cognitive process that enables students to engage deeply and meaningfully with ideas, arguments, and evidence in their writing. Conceptual studies portray critical thinking as purposeful, self-regulated judgment that involves actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from observation, experience, reflection, reasoning, or communication, ultimately guiding belief and action (Facione, 1990). This definition emphasizes deliberate mental effort rather than passive acceptance of information, positioning critical thinking as an intentional practice that questions assumptions, weighs evidence, and draws reasoned conclusions in the context of constructing coherent and persuasive written texts (Paul & Elder, 2006).

Scholars describe critical thinking as clear, reasonable, reflective thinking focused on deciding what to believe or do, involving skepticism toward assumptions and probing questions such as how knowledge is established or whether claims hold universally or contextually (Ennis, 1987). It transcends rote memorization or surface-level comprehension, requiring learners to challenge biases, recognize ambiguities, and pursue logical coherence in their reasoning (Halpern, 2014). In writing, this manifests as the ability to interrogate sources, evaluate the strength of arguments, and refine one's own positions through systematic reflection, making critical thinking inseparable from effective composition where students must not only convey ideas but also justify them rigorously (Brookfield, 2012). Another influential model frames critical thinking as the intellectually disciplined process of improving thinking quality by skillfully managing inherent structures such as purpose, question at issue, assumptions, concepts, empirical grounding, inferences, implications, and point of view while applying intellectual standards like clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness (Paul & Elder, 2006).

Bloom's taxonomy provides a hierarchical lens for understanding critical thinking development in writing, organizing cognitive processes from lower-order skills like remembering and understanding to higher-order ones such as applying, analyzing, evaluating, and creating (Tee, et. al., 2010). In secondary education, critical thinking aligns particularly with analysis (breaking down arguments into components), evaluation (judging evidence quality and logical validity), and creation (synthesizing original positions or solutions). This framework underscores that effective composition demands progression to these advanced levels, where students not only comprehend texts but also critique, integrate, and innovate upon them in their own work (Kratwohl, 2002).

Artificial intelligence (AI) has transformed educational practices by introducing intelligent writing assistants that support students during the planning, drafting, revising, and editing stages of writing. AI-powered tools such as ChatGPT, Grammarly, Copilot, and other automated writing systems provide instant feedback on

grammar, vocabulary, coherence, and organisation, thereby influencing students' writing proficiency. Recent literature indicates that while AI has considerable potential to improve writing quality, concerns remain regarding originality, critical thinking, and overdependence on technology.

Writing proficiency refers to learners' ability to communicate ideas effectively through accurate grammar, coherent organisation, appropriate vocabulary, creativity, and critical reasoning. Traditional approaches to writing instruction rely heavily on teacher feedback, which may be delayed because of large class sizes and limited instructional time. AI writing tools have emerged as complementary technologies that provide immediate formative feedback, enabling students to identify and correct language errors independently. Consequently, AI has become an important component of educational technology aimed at improving language learning outcomes.

Several empirical studies have reported positive effects of AI on students' writing proficiency. Mahapatra (2024), for instance, found that students who used ChatGPT as a formative feedback tool demonstrated improvements in grammar, coherence, vocabulary, and overall writing quality. The study concluded that AI facilitates continuous revision and encourages learners to reflect on teacher and machine-generated feedback, thereby improving writing performance.

Similarly, Rahmi, Amalina, Andriansyah and Rodgers (2024) examined the effectiveness of an AI-generated writing assistant among English language learners. Their findings revealed that AI-supported writing enhanced students' fluency, lexical choice, grammatical accuracy, and confidence in English composition. Nevertheless, the researchers cautioned that excessive dependence on AI-generated suggestions could reduce learners' ability to develop independent writing skills if teachers failed to provide adequate guidance. A systematic review by Aljuaid (2024) further demonstrated that AI tools contribute significantly to academic writing instruction by providing personalised feedback, reducing writing anxiety, and improving revision practices. However, the review also highlighted concerns relating to academic integrity, plagiarism, diminished originality, and reduced cognitive engagement among learners. The author therefore recommended that AI should complement rather than replace conventional writing instruction. Woo et al. (2024) investigated the integration of AI-generated text into students' English writing and observed that AI-assisted compositions generally exhibited better organisation and language accuracy than conventional essays. However, the researchers found that some students relied excessively on AI-generated content, resulting in limited personal expression and reduced originality. They therefore emphasised the importance of balancing AI assistance with students' own creative contributions.

Beyond linguistic competence, AI also influences students' critical thinking. Zhao, et. al., (2024) argued that although generative AI simplifies writing processes and supports idea generation, students may become passive recipients of AI-generated information if they fail to evaluate, question, and modify the generated content critically. They proposed the concept of AI literacy, which emphasises students' ability to use AI responsibly while maintaining independent reasoning and reflective thinking. From the perspective of educational technology, AI writing tools exemplify technology-enhanced learning environments that support personalised instruction, adaptive feedback, and learner autonomy. Educational technology seeks to improve teaching and learning through the effective integration of digital innovations. AI aligns with this objective by providing immediate assessment, customised learning experiences, and opportunities for self-regulated learning. However, successful implementation depends largely on teachers' digital competence, ethical awareness, and pedagogical strategies for integrating AI into classroom instruction.

The relevance of this study to Social Studies education is equally significant. Social Studies promotes critical thinking, responsible citizenship, ethical decision-making, digital literacy, and responsible technology use. As AI becomes increasingly integrated into educational settings, students must learn not only how to use these technologies effectively but also how to evaluate AI-generated information critically, recognise bias, uphold academic honesty, and make informed ethical decisions. Investigating the influence of AI on writing proficiency therefore contributes to Social Studies by promoting responsible digital citizenship and preparing learners to participate effectively in a technology-driven society. Overall, existing literature suggests that AI has considerable potential to improve students' writing proficiency through enhanced grammar, vocabulary, organisation, and revision. Nevertheless, concerns regarding originality, critical thinking, overreliance, and ethical use remain unresolved. These mixed findings underscore the need for further empirical investigation

into how AI influences students' writing proficiency in English composition and the implications of such influence for educational technology and Social Studies education.

English Composition

English composition refers to the structured process of creating coherent, purposeful written texts in the English language, encompassing the organization of ideas, sentences, and paragraphs to communicate effectively with intended audiences (Flower & Hayes, 1981). At the senior secondary school level, English composition involves more than mechanical adherence to grammar rules; it is a multifaceted act of assembling words, sentences, and larger units into meaningful wholes that convey clear messages, arguments, narratives, or explanations (Emig, 1986). This process requires writers to make deliberate choices about structure, style, tone, and content to achieve clarity, coherence, and impact, transforming individual thoughts into organized discourse suitable for academic, professional, or personal purposes (Graves, 1983). Scholars conceptualize English composition as the art and craft of writing, where the writer assembles elements to form a unified piece that serves a specific rhetorical purpose (Murray, 1972).

In secondary school, English composition aligns with curriculum goals that prepare students for examinations, further education, and lifelong communication needs (Applebee & Langer, 2013). It emphasizes expository and argumentative modes, where students construct theses, support claims with evidence, and anticipate counterarguments (Hillocks, 1986). Conceptual frameworks highlight the integration of reading and writing, as strong composition relies on analyzing models, synthesizing sources, and responding thoughtfully to prompts (Scardamalia & Bereiter, 1987). Audience awareness emerges as central: effective composition considers who will read the work, adapting tone, vocabulary, and structure accordingly to achieve persuasion, explanation, or engagement (Graham & Perin, 2007).

Measurement of English composition in secondary education employs rubrics that assess multiple dimensions: content development (depth and relevance of ideas), organization (logical flow and paragraph unity), coherence and cohesion (use of transitions and linking devices), language use (vocabulary range, sentence variety, and grammatical accuracy), and mechanics (punctuation, spelling, and formatting) (NCTE, 2018). High-quality compositions demonstrate originality in idea presentation, sophisticated reasoning, and polished execution that reflects careful revision (Anderson & Krathwohl, 2001). Rubrics provide clear criteria for feedback, guiding students toward improvement and aligning assessment with conceptual goals of fostering thoughtful, independent writers (Graham & Perin, 2007).

Influence of AI Writing Tools on Originality in English Composition

The influence of AI writing tools on originality in English composition has become a prominent theme in recent educational research, particularly following the widespread availability of generative models such as ChatGPT, Google Gemini, Claude, and QuillBot starting in late 2022 and continuing through 2026. Originality in this context refers to the creation of authentic, distinctive written work featuring novel ideas, personal voice, independent reasoning, and avoidance of formulaic or derivative expression (Glăveanu, 2020; Runco, 2007). Empirical investigations across EFL/ESL, higher education, and emerging secondary contexts reveal a nuanced, often polarized impact: AI tools frequently enhance originality by reducing barriers to ideation, broadening conceptual exploration, and facilitating reflective refinement (Yang et al., 2025), yet they can also diminish it through homogenization, reduced agency, and bypassed creative processes when usage lacks critical oversight (Mitra, 2025). This theme synthesizes key patterns from recent studies, emphasizing dual effects, moderating factors, contextual variations, and implications for senior secondary students, including in multilingual, resource-constrained environments like Nigeria.

A consistent positive pattern emerges when AI tools are positioned as supportive collaborators rather than dominant content providers. In EFL and ESL settings, targeted use of ChatGPT and similar generative models has led to measurable improvements in idea novelty, argumentative depth, and expressive variety (Khampusaen, 2025). Students who leverage AI for initial brainstorming, alternative viewpoint suggestions, or structural outlines often generate more diverse and convincing content than those relying solely on traditional methods. Qualitative accounts indicate that AI effectively overcomes writer's block by offering prompts or expansions that spark unconventional angles, enabling learners to experiment with perspectives they might not

have considered independently (Bahri, et. al., 2025). When followed by active revision where students critique AI suggestions, infuse personal insights, or adapt outputs to cultural or contextual nuances originality strengthens significantly, as reflected in higher rubric scores for content uniqueness and intellectual ownership (Yang et al., 2025; Deep & Chen, 2025). These gains are especially evident in iterative workflows, where AI functions as a thought partner that amplifies divergent thinking without overriding human synthesis (Almusharraf, et. al., 2023).

Methodological approaches in the literature reinforce the reliability of these observations. Mixed-methods designs combining quantitative pre/post-intervention comparisons, originality-focused rubric assessments, similarity metrics, and qualitative interviews or reflections provide converging evidence (Niloy et al., 2023; Yang et al., 2025; Moon, 2024). Rubric subscales measuring novelty, voice, and ownership typically rise in guided AI conditions (e.g., brainstorming or targeted revision) but decline or stagnate in unmonitored heavy-use scenarios (Khampusaen, 2025; Deep & Chen, 2025). Text similarity analyses and AI-detection classifiers reveal higher uniformity in heavily AI-assisted work, while student self-reports highlight mixed experiences: appreciation for expanded idea space alongside worries about authenticity and creative atrophy (Marzuki et al., 2023; Bahari, 2025). Case studies and controlled experiments further illustrate that explicit pedagogical interventions such as training in prompt engineering, mandatory critique of AI outputs, and emphasis on personal integration consistently moderate effects, shifting outcomes toward enhanced rather than diminished originality (Liu & Jin, 2025; Imran & Almusharraf, 2023).

Contextual and cultural factors play a crucial role in shaping these influences. In EFL/ESL environments, where linguistic hurdles can stifle initial expression, AI offers substantial scaffolding for content innovation and rhetorical experimentation, often enabling more original argumentation than might emerge unaided (Khampusaen, 2025; Yang et al., 2025). In multilingual Nigerian secondary contexts, AI can help bridge proficiency gaps by modeling formal structures and vocabulary, potentially freeing cognitive resources for culturally relevant or personally meaningful contributions (Ya'u & Mohammed, 2025). However, uneven digital access, limited teacher training, and examination-driven pressures heighten homogenization risks, as students may prioritize quick, standardized outputs over unique voice (Mozumder et al., 2023; Farrokhnia et al., 2023). Emerging evidence from developing regions suggests AI's scaffolding potential for equity, but stresses the need for localized strategies that prioritize cultural authenticity and critical engagement to counteract formulaic tendencies (Rahmeh, 2023; Zhang et al., 2024).

Ethical considerations are deeply intertwined with originality concerns. Widespread surveys indicate student and educator apprehension that AI blurs lines between genuine creation and derivation, potentially normalizing reduced personal contribution or plagiarism-like behaviors (Ya'u & Mohammed, 2025; Johnke et al., 2023). While direct causation between AI use and plagiarism is not always strong when ethical guidelines are followed, frequent reliance can subtly erode perceived ownership and originality, with some students producing near-identical responses from shared prompts (Haleem et al., 2022). Detection challenges persist, as refined AI-assisted texts often appear original while evading conventional checks (Qadir, 2022). These patterns call for robust policies on attribution, responsible use, and pedagogical focus on human agency to protect the integrity of original composition (Dwivedi et al., 2023).

Pedagogical responses to this theme advocate intentional, balanced integration. Educators who treat AI as a tool for exploration requiring evaluation of suggestions, justification of modifications, and integration of personal perspectives report stronger originality outcomes (Bahari, 2025; Liu & Jin, 2025). Strategies like reflective journaling on AI use, collaborative revision protocols, and emphasis on metacognition help mitigate homogenization while capitalizing on AI's generative strengths (Woo & Guo, 2023). In secondary education, where voice and creativity are foundational, such approaches can counteract risks by centering active learner involvement over mere efficiency (Niloy et al., 2023; Moon, 2024).

The influence of AI writing tools on originality in English composition reflects a tension between augmentation and erosion. Thoughtful, critically mediated use expands creative possibilities, dismantles barriers, and supports novel expression (Marzuki et al., 2023; Khampusaen, 2025; Yang et al., 2025). Uncritical dependence promotes uniformity, weakens agency, and undermines independent creativity (Chayka, 2025; Niloy et al., 2023). These insights highlight the imperative for ongoing, context-aware research particularly in secondary and diverse global settings to develop frameworks that harness AI's benefits while safeguarding the

human essence of original composition. This theme informs parallel discussions on critical thinking and broader challenges in AI-assisted writing.

Influence of AI Writing Tools on Critical Thinking Skills in English Composition

The influence of AI writing tools on critical thinking skills in English composition has become a central theme in recent educational discourse, particularly since the mainstream integration of generative models such as ChatGPT, Google Gemini, Claude, and Grammarly from 2023 onward. Critical thinking in composition involves purposeful, reflective judgment analyzing arguments, evaluating evidence, synthesizing ideas, drawing inferences, explaining reasoning, and self-regulating thought processes. Research reveals a dual impact: AI can strengthen critical thinking by providing immediate feedback, exposing alternative perspectives, and prompting deeper reflection during revision, yet it can also weaken it through reduced independent analysis, over-dependence, and diminished metacognitive effort when used uncritically (Graefen & Fazal, 2024; Essel et al., 2024).

Conversely, heavy or unreflective reliance frequently undermines critical thinking. Studies show that delegating core analytical tasks (e.g., argument construction, evidence evaluation, or synthesis) to AI reduces cognitive effort in higher-order processes, leading to shallower reasoning and weaker independent judgment (Graefen & Fazal, 2024; Baidoo-Anu & Ansah, 2023; Niloy et al., 2023). Over-dependence creates an "illusion of competence," where students accept polished but unexamined outputs, bypassing the reflective scrutiny essential for developing evaluation and inference skills (Hedrih, 2024; Moon, 2024). In high-stakes settings, time pressure exacerbates this: learners favor quick AI-generated coherence over rigorous self-correction, resulting in diminished metacognitive monitoring and reasoning depth (Reinhart et al., 2025; Ya'u & Mohammed, 2025). Habitual uncritical use risks deskilling reducing the habitual practice of analyzing, questioning, and synthesizing that critical thinking requires (Perkins et al., 1993; Halpern, 2014).

Mixed-methods evidence supports these patterns. Pre/post-intervention designs, critical thinking rubrics (e.g., assessing explanation, evidence use, multiple perspectives, and inference), and self-report measures show gains in guided conditions but stagnation or decline in unmonitored heavy-use scenarios (Yang et al., 2025; Khampusaen, 2025; Essel et al., 2024). Qualitative data reveal a split: appreciation for AI's role in revealing logical flaws or prompting deeper consideration, alongside concern that effortless generation reduces the need to wrestle with ideas independently (Marzuki et al., 2023; Bahari, 2025). Experiments confirm that explicit interventions prompting evaluation of AI reasoning, requiring counterargument development, and mandating reflective justification shift outcomes toward enhanced critical thinking (Liu & Jin, 2025; Imran & Almusharraf, 2023).

Contextual factors significantly moderate these effects. In EFL/ESL environments, where linguistic barriers can hinder analytical expression, AI lowers entry costs for complex reasoning, enabling students to focus on evaluation and synthesis rather than surface mechanics (Khampusaen, 2025; Yang et al., 2025). In Nigerian secondary contexts, large classes and limited individualized feedback make AI a valuable proxy for scaffolding critical processes, yet uneven access and exam-driven priorities increase risks of superficial adoption (Ya'u & Mohammed, 2025; Mozumder et al., 2023). Without guidance, students may prioritize polished outputs over reasoned depth, widening gaps in higher-order skill development. Ethical and pedagogical implications are closely linked. Surveys highlight educator concern that AI-assisted writing may foster passive acceptance over active inquiry, potentially eroding the disposition for critical thought (Johinke et al., 2023; Dwivedi et al., 2023). Balanced responses emphasize intentional design: treating AI as a prompt for critique, requiring students to identify flaws, justify revisions, and articulate reasoning behind changes (Bahari, 2025; Woo & Guo, 2023). In secondary education, where critical thinking dispositions are still forming, such strategies help preserve agency while leveraging AI's strengths.

Challenges of AI Writing Tools in English Composition, Educational technology and Social studies education

The integration of AI writing tools into English composition, educational technology and social studies instruction introduces significant challenges that extend beyond technical limitations to pedagogical, ethical, cognitive, equity, and contextual concerns. While these tools offer efficiency, personalized feedback, and

scaffolding, their widespread use raises questions about authenticity, skill development, academic integrity, and equitable access particularly in senior secondary education and resource-constrained settings such as Nigeria. This theme examines the major challenges, drawing from empirical and theoretical literature, and highlights implications for preserving the integrity of composition as a site of critical and creative human expression.

One of the most persistent challenges is over-dependence and the risk of cognitive deskilling. When students habitually rely on AI for idea generation, drafting, structuring, paraphrasing, or editing, they may bypass essential cognitive processes required for deep learning (Graefen & Fazal, 2024; Baidoo-Anu & Ansah, 2023). Empirical studies show that excessive delegation reduces independent reasoning, metacognitive self-regulation, and higher-order thinking skills central to composition (Niloy et al., 2023; Hedrih, 2024). Students often accept polished outputs without sufficient scrutiny, creating an "illusion of competence" where surface fluency masks shallow understanding (Moon, 2024; Perkins et al., 1993). In secondary contexts, where foundational voice and analytical habits are still forming, this pattern risks long-term erosion of writing autonomy and intellectual ownership (Ya'u & Mohammed, 2025; Reinhart et al., 2025).

Closely related is the homogenization of student writing. Generative AI models, trained on vast but patterned datasets, tend to produce text with predictable phrasing, conventional structures, neutral tone, and standardized argumentation (Chayka, 2025; Feuston & Brubaker, 2021). When students adopt AI suggestions uncritically, their compositions increasingly resemble one another lacking distinctive voice, cultural nuance, or bold insight (Niloy et al., 2023; Moon, 2024). This uniformity undermines originality and personal expression, core goals of English composition pedagogy (Glăveanu, 2020; Runco, 2007). In multilingual environments like Nigeria, homogenization can further marginalize local rhetorical styles, idioms, and perspectives, favoring a globalized, formulaic academic English that erases individual and cultural identity (Ya'u & Mohammed, 2025).

Equity and access disparities constitute a critical structural challenge. While AI tools promise democratization of writing support, unequal access to devices, reliable internet, electricity, and digital literacy training creates new divides (Mozumder et al., 2023; Farrokhnia et al., 2023). In Nigerian secondary schools, large class sizes, inconsistent infrastructure, and socioeconomic barriers limit meaningful integration for many students (Ya'u & Mohammed, 2025). Those with access may gain advantages in exam preparation and skill development, while others fall further behind, widening achievement gaps rather than closing them. Uneven teacher training further complicates implementation: many educators lack familiarity with AI tools or strategies for ethical, pedagogically sound use (Marzuki et al., 2023).

Pedagogical and assessment challenges arise from the difficulty of distinguishing student-generated from AI-generated content. Traditional rubrics emphasize final product quality, but when AI handles mechanics, structure, or even argumentation, teachers struggle to evaluate authentic skill levels (Reinhart et al., 2025). This complicates formative feedback and summative grading, as polished AI-assisted work may mask underlying weaknesses in reasoning, voice, or originality (Niloy et al., 2023; Moon, 2024). Shifting assessment toward process evidence drafts, reflections, revision logs, or oral defenses requires substantial redesign of practices, time, and resources often unavailable in large, under-resourced classrooms.

Cultural and contextual misalignment represents a subtle but significant challenge. Many AI models are trained predominantly on Western, English-dominant datasets, leading to outputs that privilege certain rhetorical norms, citation styles, and cultural references (Rahmeh, 2023). In African and Nigerian contexts, this can result in suggestions that feel alien or decontextualized, discouraging culturally relevant expression or reinforcing linguistic hegemony (Adegbite, 2006). Students may internalize these biases, producing work that conforms to globalized standards at the expense of local voice and identity. Hallucinations and factual inaccuracies pose practical risks. AI tools occasionally generate plausible but incorrect information, misleading students who lack sufficient domain knowledge to detect errors (Qadir, 2022; Haleem et al., 2022). In composition tasks requiring research or evidence-based argumentation, unchecked reliance can propagate misinformation, undermining credibility and critical evaluation skills (Graefen & Fazal, 2024; Baidoo-Anu & Ansah, 2023).

Finally, the rapid evolution of AI outpaces policy and teacher preparedness. By 2026, tools have become more sophisticated, yet institutional guidelines, teacher training programs, and curriculum frameworks lag behind (Johinke et al., 2023). This mismatch leaves educators to improvise responses, often without sufficient support to address ethical, pedagogical, or equity concerns effectively.

AI writing tools present multifaceted challenges to English composition: cognitive deskilling and over-dependence (Graefen & Fazal, 2024; Baidoo-Anu & Ansah, 2023), homogenization of voice and style (Chayka, 2025; Moon, 2024), threats to academic integrity (Qadir, 2022; Haleem et al., 2022), inequitable access and cultural misalignment (Mozumder et al., 2023; Ya'u & Mohammed, 2025), assessment difficulties (Reinhart et al., 2025; Deep & Chen, 2025), factual inaccuracies (Haleem et al., 2022), and policy lag (Dwivedi et al., 2023). These challenges highlight the urgent need for deliberate, context-sensitive pedagogical strategies, robust ethical frameworks, equitable infrastructure investment, and ongoing professional development. Only through balanced, critically informed integration can educators mitigate risks while harnessing AI's potential to support rather than supplant authentic composition development at the secondary level. This theme underscores the broader tension between technological innovation and the preservation of human-centered learning in English language

METHODOLOGY

A mixed-methods approach was employed, combining both quantitative and qualitative data. Quantitative data were obtained through structured questionnaires and rubric-scored writing tasks, while qualitative data were gathered through open-ended questions and reflective responses. The population of the study comprised all Senior Secondary School II (SSS II) students offering English Language in public and private secondary schools in Lagos State, Nigeria. A multi-stage sampling technique was adopted for this study. At the first stage, four secondary schools (two public and two private) were randomly from Ojo. At the second stage, one intact SSS II class was selected from each school. The average class size was approximately 35 students. However, a total of 200 students were used as the final sample for the study. Two instruments were used for data collection: Questionnaire on AI Writing Tools Usage and Influence (QAITUI) and English Composition Writing Task (ECWT) Students were required to write an argumentative essay on a given topic under controlled conditions. The instruments were subjected to face and content validity. Inferential statistics including Pearson Product Moment Correlation and multiple regression analysis were used to test relationships and predictive effects. Qualitative data from open-ended responses were analysed using thematic analysis. Responses were coded and grouped into themes, supported with relevant excerpts.s

DATA ANALYSIS

Research Question One

To what extent do AI writing tools as educational technologies influence English compositions produced by senior secondary school students, and what are the implications for Social Studies Education?

Table 4.5: Mean Responses on the Influence of AI Writing Tools on Students' Originality

S/N	Item	Mean	SD	Decision
1	My ideas are influenced by AI-generated content rather than my own thinking.	3.11	0.79	Agree
2	I modify AI-generated responses to reflect my personal understanding.	3.22	0.73	Agree
3	I rarely develop completely original ideas when relying on AI.	3.06	0.82	Agree
4	I reflect on whether my writing truly represents my own thoughts.	3.18	0.74	Agree
5	I question the uniqueness of ideas provided by AI tools.	2.95	0.81	Agree
6	AI tools shape the way I express my ideas.	3.17	0.76	Agree
7	I combine my own ideas with AI suggestions.	3.24	0.69	Agree
8	I rarely produce essays independent of AI influence.	2.98	0.84	Agree
9	I think critically about how AI affects the authenticity of my writing.	3.15	0.72	Agree
10	I deliberately ensure my writing remains original when using AI.	2.99	0.8	Agree
	Grand Mean	3.11	0.77	Agree

Interpretation

The results in Table 4.5 reveal a grand mean of **3.11**, indicating that respondents agreed that AI writing tools influence the originality of English compositions. Students acknowledged that AI affects idea generation, writing style and the expression of thoughts combine it with their own ideas to maintain originality.

Research Question Two

What effect do AI writing tools have on the critical thinking skills demonstrated by senior secondary school students in English composition tasks, Educational Technology and Social Studies Education?

Table 4.6: Mean Responses on the Effect of AI Writing Tools on Critical Thinking Skills

S/N	Item	Mean	SD	Decision
1	I analyse AI-generated responses before using them.	3.1	0.75	Agree
2	I evaluate the accuracy of AI information.	3.03	0.8	Agree
3	I question the logic behind AI-generated arguments.	2.81	0.87	Agree
4	I rely on AI instead of thinking deeply.	2.95	0.83	Agree
5	I compare AI-generated ideas with my own reasoning.	2.89	0.84	Agree
6	AI helps me explore different perspectives.	3.18	0.72	Agree
7	I justify my arguments even when using AI.	3.02	0.76	Agree
8	I engage in deep thinking despite AI providing answers.	2.85	0.82	Agree
9	I organise ideas independently before accepting AI suggestions.	3.09	0.73	Agree
10	I reflect on the strengths and weaknesses of AI-generated content.	2.97	0.79	Agree
	Grand Mean	2.99	0.79	Agree

Interpretation

The findings show a grand mean of **2.99**, indicating that respondents agreed that AI writing tools influence their critical thinking skills. While AI assists students in exploring multiple perspectives and evaluating information, excessive dependence on AI may reduce opportunities for deeper independent reasoning.

Research Question Three

What are the key challenges associated with the use of AI writing tools in relation to English composition proficiency Educational Technology and Social Studies Education?

Table 4.7: Mean Responses on the Challenges of AI Writing Tool Usage

S/N	Item	Mean	SD	Decision
1	Difficulty writing effectively without AI.	3.15	0.78	Agree
2	Dependence on AI for correcting errors.	3.18	0.74	Agree
3	Confusion when AI provides different answers.	3.12	0.81	Agree
4	Heavy reliance on AI limits writing improvement.	3.09	0.79	Agree
5	AI reduces learning effort.	3.17	0.76	Agree
6	Difficulty determining whether AI responses are correct.	3.08	0.82	Agree
7	AI sometimes provides inconsistent responses.	3.14	0.77	Agree
8	Lack of confidence without AI assistance.	3.05	0.8	Agree
9	AI negatively affects students' seriousness toward learning.	3.11	0.75	Agree

10	Students engage less fully in writing when AI is available.	3.13	0.79	Agree
	Grand Mean	3.12	0.78	Agree

Interpretation

Table 4.7 reveals a grand mean of **3.12**, indicating that respondents agreed that several challenges accompany the use of AI writing tools. The major challenges identified include excessive dependence on AI, reduced confidence in independent writing, confusion arising from inconsistent AI-generated responses, and reduced effort toward developing writing proficiency and critical thinking skills.

Table 4.8: Pearson Product Moment Correlation between AI Writing Tools Usage and Students' Originality

Variables	N	Mean	SD	r	Sig. (2-tailed)	Decision
AI Writing Tools Usage	200	30.84	4.72			
Originality	200	31.12	4.31	0.642	0	Reject H ₀₁

Decision Rule

Reject the null hypothesis if the probability value (p-value) is less than 0.05.

Decision

Since the calculated p-value (0.000) is less than the 0.05 level of significance, the null hypothesis is rejected.

Interpretation

The result reveals a statistically significant positive relationship between AI writing tools usage and students' originality in English composition ($r = 0.642$, $p < 0.05$). This indicates that AI writing tools significantly influence students' originality. The moderate positive correlation suggests that students who use AI tools appropriately tend to modify, refine and personalise AI-generated ideas rather than simply reproducing them.

Table 4.9: Pearson Product Moment Correlation between AI Writing Tools Usage and Students' Critical Thinking Skills

Variables	N	Mean	SD	r	Sig. (2-tailed)	Decision
AI Writing Tools Usage	200	30.84	4.72			
Critical Thinking	200	29.94	4.68	0.531	0	Reject H ₀₂

Decision

Since the significance value of 0.000 is less than 0.05, this is rejected.

Interpretation

The analysis indicates a statistically significant positive relationship between AI writing tools usage and students' critical thinking skills ($r = 0.531$, $p < 0.05$). Although AI writing tools assist students in exploring ideas, comparing viewpoints and organising arguments, the strength of the relationship suggests that students' critical thinking still depends largely on how thoughtfully they engage with AI-generated content.

Table 4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.706	0.498	0.491	3.341

Interpretation

The model summary indicates a multiple correlation coefficient (R) of 0.706, showing a strong relationship between the predictor variables and students' critical thinking skills. The coefficient of determination ($R^2 = 0.498$) implies that approximately 49.8% of the variation in students' critical thinking skills is explained jointly by AI writing tools usage, originality and the challenges associated with AI use.

Table 4.11: ANOVA

Source	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2167.184	3	722.395	64.81	0.000
Residual	2184.816	196	11.147		
Total	4352.000	199			

Interpretation

The ANOVA result shows that the regression model is statistically significant ($F = 64.81$, $p < 0.05$). This indicates that the predictor variables jointly explain a significant proportion of the variation in students' critical thinking skills.

Table 4.12: Regression Coefficients

Predictor Variable	Unstandardized B	Standard Error	Standardized Beta	t	Sig.
Constant	9.612	1.874		5.13	0
AI Writing Tools Usage	0.381	0.064	0.381	5.93	0
Originality	0.284	0.062	0.284	4.56	0
Challenges	-0.244	0.061	-0.244	-3.98	0.001

Decision

Since the significance values for the predictor variables are less than 0.05, this is rejected.

Interpretation

The regression analysis shows that AI writing tools usage ($\beta = 0.381$, $p < 0.05$) and originality ($\beta = 0.284$, $p < 0.05$) positively predict students' critical thinking skills. Conversely, perceived challenges associated with AI usage ($\beta = -0.244$, $p < 0.05$) negatively predict critical thinking skills. This suggests that while AI tools can enhance learning when used responsibly, excessive dependence and the associated challenges may hinder students' independent reasoning and writing proficiency.

DISCUSSION OF FINDINGS

To what extent do AI writing tools as educational technologies influence English compositions produced by senior secondary school students, and what are the implications for Social Studies Education?

The first objective of this study was to examine the influence of AI writing tools on students' originality in English composition. The descriptive analysis showed that respondents agreed that AI writing tools influence the originality of their written compositions, with a grand mean of 3.11. Furthermore, the Pearson Product

Moment Correlation analysis revealed a statistically significant positive relationship between AI writing tools usage and students' originality ($r = 0.642$, $p < 0.05$). Consequently, the first null hypothesis was rejected.

This finding suggests that AI writing tools have become an important support mechanism during writing activities. Many students use AI applications such as ChatGPT, Grammarly and QuillBot to generate ideas, improve sentence construction, organise paragraphs and refine vocabulary. When used appropriately, these tools can assist students in overcoming writer's block and developing more coherent essays. However, the findings also suggest that maintaining originality depends largely on the student's ability to critically evaluate, modify and personalise AI-generated content rather than copying it directly.

The positive relationship observed in this study indicates that AI does not necessarily diminish originality. Rather, students who engage actively with AI-generated suggestions by incorporating their own experiences, opinions and reasoning are more likely to produce original compositions. Originality, therefore, is influenced not only by the availability of AI tools but also by the user's writing habits, ethical awareness and level of digital literacy.

This finding is consistent with the work of Kasneci et al. (2023), who argued that generative AI can stimulate students' creativity by providing multiple perspectives that inspire independent thinking rather than replacing it. Similarly, Dwivedi et al. (2023) observed that AI systems can improve students' productivity and writing quality when they are used as collaborative learning tools instead of substitutes for students' own ideas. Cotton, Cotton and Shipway (2023) also maintained that the educational value of AI depends largely on responsible usage and institutional guidance.

The finding is equally supported by Constructivist Learning Theory, which posits that learners actively construct knowledge through interaction, reflection and personal experiences. AI writing tools can provide learning support, but meaningful learning occurs only when students process information critically and integrate it with their existing knowledge. Therefore, AI should serve as a scaffold that encourages independent thinking rather than replacing students' intellectual effort.

Nevertheless, the findings also highlight concerns regarding excessive dependence on AI-generated content. Students who rely heavily on AI without evaluating or modifying the responses may gradually lose confidence in their own writing abilities and produce compositions that lack authentic personal voice. This underscores the importance of teaching students ethical AI use alongside academic writing skills

What effect do AI writing tools have on the critical thinking skills demonstrated by senior secondary school students in English composition tasks, Educational Technology and Social Studies Education?

The second objective sought to assess the effect of AI writing tools on students' critical thinking skills in English composition. The descriptive analysis indicated that respondents generally agreed that AI writing tools influence their critical thinking, with a grand mean of 2.99. Pearson correlation analysis further showed a significant positive relationship between AI writing tools usage and students' critical thinking skills ($r = 0.531$, $p < 0.05$). Consequently, the second null hypothesis was rejected.

This finding implies that AI writing tools can contribute positively to students' critical thinking when they are used appropriately. AI applications expose students to alternative viewpoints, relevant examples, improved vocabulary and different approaches to organising arguments. Such exposure encourages learners to compare ideas, evaluate evidence and make informed decisions while preparing English compositions. These findings corroborate that of Ariyibi et al. (2025) which showed that students with better awareness and use of AI based systems held more accepted perception along with improved academic outcome than those who had fewer levels than them.

However, the findings equally suggest that the development of critical thinking depends on how students engage with AI-generated information. Students who question AI responses, verify information from other credible sources and critically analyse suggested arguments are more likely to strengthen their reasoning abilities. Conversely, students who simply accept AI-generated responses without reflection may experience reduced opportunities to practise analytical thinking and problem-solving.

These findings agree with UNESCO (2023), which emphasised that generative AI has considerable potential to improve learning outcomes when integrated responsibly into educational practice. UNESCO further noted that AI should complement teachers' instructional strategies rather than replace learners' active participation in the learning process. Likewise, Tlili et al. (2023) reported that AI technologies enhance personalised learning and encourage higher-order thinking when learners remain actively engaged in evaluating AI-generated information.

Similarly, Rudolph et al. (2023) argued that AI technologies should function as cognitive partners that stimulate inquiry, reflection and intellectual engagement instead of providing ready-made answers that discourage independent reasoning. The present study supports this position by demonstrating that students benefit most when AI is used to facilitate thinking rather than eliminate the thinking process.

The findings also align with Vygotsky's Social Constructivist Theory, which views learning as a socially mediated process supported by appropriate tools and guidance. AI writing tools may function as cognitive scaffolds within learners' Zone of Proximal Development by assisting students in completing tasks they may initially find difficult. However, sustained intellectual growth requires students to gradually assume greater responsibility for analysing, evaluating and constructing knowledge independently.

What are the key challenges associated with the use of AI writing tools in relation to English composition proficiency Educational Technology and Social Studies Education?

The third objective examined the challenges associated with the use of AI writing tools in relation to students' English composition proficiency levels, educational technology and social studies and critical thinking skills. The descriptive findings showed that respondents agreed that AI writing tools present several challenges, with a grand mean of 3.12. Furthermore, the regression analysis revealed that perceived challenges significantly and negatively predicted students' critical thinking skills ($\beta = -0.244$, $p < 0.05$). Therefore, the third null hypothesis was rejected.

This finding indicates that although AI writing tools provide several educational benefits, they also introduce challenges capable of affecting students' writing proficiency and independent reasoning. The major challenges identified include overdependence on AI-generated responses, reduced confidence in independent writing, difficulty verifying the accuracy of AI-generated information, inconsistent AI responses and reduced motivation to practise writing without technological assistance.

The negative regression coefficient suggests that as these challenges increase, students' critical thinking skills tend to decrease. Excessive dependence on AI may reduce opportunities for students to engage in brainstorming, drafting, revising and evaluating their own ideas—activities that are essential for developing strong writing and analytical skills.

This finding supports UNESCO (2023), which warned that unrestricted use of generative AI in education could weaken learners' creativity, critical thinking and academic integrity if appropriate safeguards are not established. Holmes et al. (2022) similarly observed that while AI provides valuable educational support, overreliance on intelligent systems may reduce students' motivation to solve problems independently.

The finding also agrees with Selwyn (2019), who argued that educational technologies should enhance human learning rather than replace essential cognitive processes. AI should therefore be integrated into teaching in ways that encourage reflection, evaluation and creativity instead of passive acceptance of machine-generated information.

CONCLUSION

This study concludes that artificial intelligence has a significant influence on students' writing proficiency in English composition. Although AI writing tools can enhance grammar, vocabulary, coherence, and overall writing quality, their effectiveness depends on responsible and guided use. The study further concludes that integrating AI into English language instruction has important implications for educational technology and

Social Studies education by promoting digital literacy, ethical technology use, and critical thinking among learners.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. English Language teachers should guide students on the ethical and responsible use of AI writing tools during composition activities.
2. Schools should organise regular workshops on AI literacy, digital ethics and academic integrity for both teachers and students.
3. Students should be encouraged to use AI tools primarily for brainstorming, editing and feedback rather than copying complete responses.
4. Curriculum developers should incorporate AI literacy and critical evaluation skills into the English Language curriculum.

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