

Artificial intelligence use, academic engagement, and psychological well-being among secondary school students

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Abstract: Artificial intelligence (AI) is rapidly becoming part of students’ educational and psychosocial environments. Yet evidence on its simultaneous influence on learning engagement and psychological well-being among secondary school students remains limited, particularly in low- and middle-income settings. This paper examined the emerging relationship between AI use, academic engagement, and psychological well-being among students. The study adopted an integrative literature-review design, synthesising four focal Nigerian sources with fourteen additional verified empirical, meta-analytic, and review sources, together with established theoretical and policy frameworks (Self-Determination Theory, Cognitive Load Theory, Social Cognitive Theory, the Transactional Model of Stress and Coping, and UNESCO’s human-centred AI guidance), organised around the three constructs of AI use, academic engagement, and psychological well-being. The findings indicate that AI can support academic engagement through personalised assistance, rapid feedback, access to explanations, and learning support, with meta-analytic evidence reporting small-to-moderate positive effects on behavioural, cognitive, and emotional engagement and on learning outcomes. However, the same technologies may produce disengagement when they substitute for independent cognitive effort, facilitate academic dishonesty, or encourage excessive dependence and over-reliance. Psychological well-being presents a similarly dual picture: AI-enabled screening and conversational support may improve access, privacy, and early identification of psychological difficulties, while concerns about privacy, inaccurate outputs, emotional dependence, reduced human interaction, and inequitable access remain salient. The psychological effects of AI are best understood as contingent on the quality, intensity, purpose, and social context of use. The study concludes that AI should be positioned as a supervised, human-centred educational and psychosocial support tool rather than a replacement for teachers, counsellors, parents, or students’ own learning processes. It recommends psychologically informed AI literacy, teacher supervision, clear school policies, human oversight of mental-health applications, and routine monitoring of students’ engagement and well-being, and calls for longitudinal Nigerian research that examines AI use, engagement, and well-being within the same student population.

Keywords: Academic engagement, Artificial Intelligence, Generative AI, Psychological Well-being, Secondary school students

1. Introduction

Artificial intelligence (AI) has moved from a specialized technological domain into everyday educational environments. Generative AI systems, adaptive learning platforms, automated assessment tools, recommendation systems, and mobile mental-health applications are increasingly capable of producing explanations, feedback, summaries, questions, and conversational support. For secondary school students, this development is occurring during a period characterised by rapid cognitive, emotional, social, and identity development. Consequently, AI use in schools is not simply an instructional issue; it is also a psychological

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issue because the technology may alter how students learn, regulate effort, seek help, evaluate their competence, and interact with teachers and peers.

The scale of this phenomenon is now well documented. Kundu and Bej (2025), in a systematic scoping review of 189 empirical studies spanning preschool through high school, synthesised evidence on the psychological impacts of AI on school students across cognitive, emotional, and behavioural domains, concluding that effects are consistently contingent on how, why, and how much students use AI. This contingency is the central psychological question of the present paper. The educational relevance of AI is evident in emerging Nigerian research. Uwaoma et al. (2025) examined human-AI collaboration and continuous assessment in secondary schools in the Calabar Education Zone and reported that teachers perceived AI collaboration as positively related to continuous-assessment practices, reliability, and fairness. Their findings suggest that AI may strengthen the educational environment when it complements professional judgement rather than replacing it. This is important because assessment is not only a measurement process; it also communicates information about competence, progress, and expectations, all of which can shape students' motivation and engagement.

At the same time, AI is becoming relevant to adolescent psychological well-being. Isaiah et al. (2026a) systematically reviewed AI-based screening of adolescent mental-health conditions using mobile-health applications and identified applications involving depression, anxiety, digital phenotyping, machine learning, and other forms of automated risk detection. The review illustrates how AI can potentially extend early identification to settings where access to mental-health professionals is limited. A related scoping review of adolescent mental-health care found that AI applications have been used for diagnosis, monitoring, treatment, and prognosis, although concerns about transparency, risk of bias, and validation remain important (Sharma et al., 2025). More recently, Liang et al. (2026) mapped the application and effectiveness of AI in adolescent mental-health support and therapy, while a scoping review focused specifically on AI conversational agents for high-school wellbeing interventions reported potential reductions in depressive symptoms and stress, albeit within a still-limited evidence base (Lamb et al., 2026).

The psychological dimension becomes more complex when AI is experienced not only as a learning tool but also as a social or emotional agent. Isaiah et al. (2026b), in their qualitative exploration of AI-mediated therapeutic relationships among adults, reported that users may develop attachment to generative AI mental-health chatbots and negotiate questions of authenticity, cultural acceptability, and the meaning of a therapeutic relationship with a non-human agent. Although the participants were adults rather than secondary school students, the study is relevant to educational psychology because it demonstrates that conversational AI can occupy psychologically meaningful roles beyond information delivery.

The broader Nigerian research context represented by Useh (2026) also reflects increasing attention to psychologically informed research in health and behavioural settings. For educational psychology, the implication is that AI should be examined as part of a larger person-environment system in which cognitive, emotional, behavioural, and interpersonal processes interact. Thus, the present paper focuses on three closely related constructs: AI use, academic engagement, and psychological well-being. Academic engagement refers to students' behavioural, emotional, and cognitive involvement in learning activities. Psychological well-being refers to positive psychological functioning, including emotional balance, sense of competence, positive relationships, and a meaningful and manageable school experience. AI use may strengthen these outcomes when it provides timely scaffolding and reduces unnecessary barriers to learning. Conversely, excessive or poorly regulated use may encourage cognitive offloading, avoidance of difficult tasks, dependence on automated answers, academic dishonesty, social withdrawal, or anxiety concerning performance and technology.

The engagement evidence is now substantial. A systematic review of 72 empirical studies found that ChatGPT can influence all three dimensions of student engagement while also identifying disengagement-related concerns such as academic dishonesty and the need for stronger objective measures of engagement (Lo et al., 2024). A subsequent systematic review and meta-analysis of 17 empirical studies involving 1,735 students confirmed positive effects of ChatGPT on behavioural, cognitive, and emotional engagement, while simultaneously identifying over-reliance as a key risk (Heung & Chiu, 2025). Complementary meta-analyses of experimental studies report that ChatGPT and comparable generative AI tools produce small-to-moderate positive effects on academic performance, learning outcomes, affective-motivational states, and higher-order thinking, although effects are heterogeneous and not uniformly positive (Deng et al., 2024; Wu et al., 2026; Liu et al., 2025).

The problem is particularly important for secondary schools because students are younger, are still developing self-regulation and critical judgement, and may have less capacity than adults to evaluate the accuracy, privacy implications, or psychological consequences of AI-generated content. UNESCO (2023) therefore emphasises a human-centred approach to generative AI in education, including age-appropriate use, teacher preparation, data protection, and the preservation of human agency. Against this background, the purpose of this paper is to examine how AI use may influence academic engagement and psychological well-being among secondary school students, with particular attention to the Nigerian context.

Objectives of the study

In line with the purpose stated above, the specific objectives of this study were:

- i. To describe the patterns, purposes, and contexts of artificial intelligence use among secondary school students in academic and psychosocial domains
- ii. To synthesise the empirical evidence on the relationship between AI use and academic engagement (behavioural, emotional, and cognitive) among students
- iii. To synthesise the empirical evidence on the relationship between AI use and psychological well-being among secondary school students, including AI-based mental-health screening and conversational or relational AI

To identify and interpret, through established psychological theories and the mechanisms that explain when AI functions as a scaffold that supports learning and coping and when it functions as a substitute that undermines them.

2. Literature review

2.1. Artificial Intelligence uses in secondary education

Artificial intelligence in education encompasses technologies that perform tasks traditionally requiring aspects of human intelligence, including pattern recognition, prediction, natural-language processing, recommendation, automated feedback, and conversational interaction. In secondary schools, AI can be used for personalised learning, content generation, assessment, tutoring, language support, administrative tasks, and increasingly for student-support functions.

Uwaoma et al. (2025) provide an important Nigerian example through their investigation of human-AI collaboration in continuous assessment. Their study involved secondary-school teachers in the Calabar Education Zone and found a strong positive association between human-AI collaboration and continuous-assessment practices. The authors argued that AI can enhance efficiency, reliability, fairness, and accuracy when integrated with teacher judgement. The finding supports a collaborative rather than replacement-oriented model of AI use.

However, AI-assisted education also creates a risk that students may transfer substantial portions of the learning process to the technology. This distinction is central to educational psychology. A student who uses AI to obtain an explanation and then evaluates, applies, and reconstructs that explanation may be engaging cognitively. A student who simply copies an AI-generated answer may complete the task without equivalent cognitive engagement. Lo et al. (2024) similarly found evidence of both engagement and disengagement in ChatGPT-supported learning, and Kundu and Bej (2025) showed across 189 studies that the psychological consequences of AI for school students range from enhanced motivation and self-regulated learning to diminished critical thinking and increased dependence.

The psychological quality of AI use therefore depends on purpose and regulation. AI can function as a scaffold when it helps students break complex tasks into manageable steps, provides feedback, generates practice questions, or offers alternative explanations. It can function as a substitute when students use it primarily to avoid effort, uncertainty, or independent reasoning. This distinction suggests that AI literacy should include not only technical competence but also metacognitive knowledge about when AI should and should not be used (UNESCO, 2023).

2.2. Academic engagement

Academic engagement is multidimensional. Behavioural engagement involves participation, persistence, attendance, and completion of learning activities. Emotional engagement involves interest, enjoyment,

belonging, and positive attitudes toward learning. Cognitive engagement involves investment in understanding, strategy use, self-regulation, critical thinking, and willingness to expend mental effort. These dimensions are important because a technology can increase one dimension while weakening another.

AI may strengthen behavioural engagement by making learning tasks more accessible and responsive. A student who is unable to understand a concept from a textbook may obtain an alternative explanation from an AI tutor and consequently persist with the task. AI can also generate practice exercises and immediate feedback, potentially supporting sustained effort. The meta-analytic evidence supports this optimistic reading: Deng et al. (2024) found that experimental studies generally reported positive effects of ChatGPT on academic performance, affective-motivational outcomes, and higher-order thinking propensities; Wu et al. (2026), synthesising 35 experimental studies with 4,193 participants, reported a moderately positive overall effect on student learning outcomes; and Liu et al. (2025), synthesising 37 studies, reported a moderate positive effect of ChatGPT on academic achievement. Heung and Chiu (2025) confirmed positive effects on behavioural, cognitive, and emotional engagement specifically, although their meta-analysis of 17 studies involving 1,735 students also flagged over-reliance on AI as a consistent risk accompanying these gains.

Nevertheless, cognitive engagement may be undermined if AI removes desirable learning difficulties. When students routinely delegate planning, drafting, problem-solving, or recall to AI, they may experience short-term efficiency without developing equivalent independent skills. Lo et al. (2024) highlighted the need to distinguish productive engagement from disengagement and academic dishonesty, and Benchallal (2025), in a systematic review linking AI to both learning and psychological well-being, reported evidence that engagement benefits coexist with elevated stress and anxiety where use is intense or poorly regulated. Therefore, the educational value of AI should be evaluated by what students learn and how they think, not simply by how quickly they complete tasks.

The Nigerian evidence on AI-supported assessment is relevant here. Uwaoma et al. (2025) found that teacher-AI collaboration can improve assessment practices, suggesting that AI may provide an infrastructure for better feedback. However, feedback becomes psychologically useful only when students understand it, respond to it, and use it to modify subsequent learning. AI-supported assessment should therefore be embedded within teacher explanation, formative dialogue, and opportunities for students to reflect on their performance.

2.3. Psychological well-being among secondary school students

Psychological well-being encompasses more than the absence of mental illness. It includes positive emotional functioning, perceived competence, purpose, supportive relationships, autonomy, and the capacity to manage everyday demands. Adolescence is a particularly important developmental period because students experience increasing academic expectations, peer evaluation, identity formation, and transitions toward greater autonomy.

Digital technologies can influence these processes in both supportive and harmful ways. AI may reduce barriers to support by providing private, accessible, and immediate information. This is especially relevant where students may be reluctant to approach teachers or counsellors because of stigma or fear of judgement. Isaiah et al. (2026a) reported that AI-based mobile-health approaches have potential for early identification of adolescent depression and anxiety and highlighted accessibility, privacy, and convenience as important features.

Kundu and Bej (2025) provide the most comprehensive developmental picture to date: across 189 empirical studies of school students from preschool to high school, AI use was associated with a dual pattern of outcomes: improved learning experiences, motivation, and access to support on one hand, and risks including anxiety, reduced face-to-face interaction, and dependence on technology on the other. Benchallal (2025) similarly reported that AI influences students' learning and psychological well-being jointly, with evidence spanning engagement, academic outcomes, stress, and anxiety. These reviews establish that academic and psychological effects of AI cannot sensibly be separated.

The potential for early identification should not be confused with clinical diagnosis. Sharma et al. (2025) found that most AI applications in adolescent mental-health care have concentrated on diagnosis, while concerns about risk of bias, transparency, and validation remain. Liang et al. (2026), in a scoping review of AI in adolescent mental-health support and therapy, likewise concluded that AI holds promise as a support and therapeutic adjunct for adolescents, but that effectiveness evidence remains preliminary. Consequently, AI

screening should be treated as a possible adjunct to professional assessment rather than an autonomous diagnostic system.

AI may also influence well-being indirectly through academic functioning. If an AI tool helps a student understand difficult material, it may increase perceived competence and reduce unnecessary academic frustration. Conversely, unreliable AI outputs or excessive dependence may increase confusion, uncertainty, and performance anxiety. The direction of the effect is therefore likely to depend on AI accuracy, students' digital literacy, teacher guidance, and the extent to which students maintain independent judgement. The relational dimension of AI is equally important. Isaiah et al. (2026b) found in their qualitative study of adults that interactions with generative AI mental-health chatbots can involve attachment and questions of authenticity. Although the population differs from secondary-school students, the finding raises an important developmental question: if adolescents begin to treat AI systems as emotional companions, the technology may become part of their social environment rather than merely an academic instrument. Educational psychology therefore needs to examine whether AI use supplements human relationships or displaces opportunities for peer interaction, teacher support, and family communication.

2.4. Theoretical perspectives

2.4.1. Self-determination theory

Self-Determination Theory (SDT) proposes that psychological functioning, intrinsic motivation, and well-being are supported when three basic psychological needs (autonomy, competence, and relatedness) are satisfied (Deci & Ryan, 2000; Ryan & Deci, 2000). The theory is directly relevant to this study because AI use in secondary schools can either satisfy or frustrate each of these needs. AI may support autonomy when it allows students to choose the pace, format, and timing of explanations and practice, thereby supporting volitional, self-directed learning; it may support competence when immediate, personalised feedback enables students to experience mastery and correct errors, which is precisely the mechanism through which AI tutoring and feedback are hypothesised to strengthen behavioural and cognitive engagement (Heung & Chiu, 2025). Conversely, autonomy may be frustrated when students become dependent on AI to make decisions or produce work they cannot reproduce independently, the over-reliance risk identified in the engagement meta-analyses (Heung & Chiu, 2025; Lo et al., 2024). Relatedness may be frustrated when AI-mediated interaction displaces meaningful contact with teachers, peers, counsellors, and family (Kundu & Bej, 2025). SDT therefore links this study's two outcome constructs: need satisfaction through guided AI use predicts both deeper academic engagement and higher psychological well-being among adolescents (Niemic & Ryan, 2009; Soenens & Vansteenkiste, 2005), whereas need frustration predicts disengagement, anxiety, and social withdrawal (Benchallal, 2025). The dual findings of the engagement meta-analyses gains alongside over-reliance risk are readily interpretable through this framework: AI supports motivation when it satisfies the needs and undermines it when it displaces their fulfilment.

2.4.2. Cognitive load and scaffolding perspective

Cognitive Load Theory holds that learning is constrained by the limited capacity of working memory, and that instructional design should manage intrinsic, extraneous, and germane load so that cognitive resources are allocated to schema construction (Sweller, 1988; Sweller, van Merriënboer & Paas, 2019; van Merriënboer & Sweller, 2005). This theory is directly applicable to this study because it explains when AI assistance promotes genuine cognitive engagement and when it merely simulates it. Carefully designed AI support simplified instructions, worked examples, sequencing of complex tasks, and alternative explanations, can reduce extraneous load and free working-memory resources for germane processing, thereby deepening cognitive engagement (Sweller et al., 2019), consistent with the small-to-moderate positive learning effects reported in the meta-analyses (Deng et al., 2024; Wu et al., 2026; Liu et al., 2025). However, if AI supplies complete solutions too early, it removes the productive cognitive effort necessary for learning and produces cognitive offloading, in which students' complete tasks without constructing schemas, the mechanism underlying the disengagement and academic dishonesty concerns identified by Lo et al. (2024). The theory also explains why effects may differ among secondary school students: because scaffolding benefits diminish and can reverse as learner expertise increases (the expertise-reversal effect; Sweller et al., 2011), AI that scaffolds a novice appropriately may become a crutch for a more knowledgeable student. Read alongside the scaffolding literature, in which support is intended to be temporary and progressively withdrawn so that responsibility transfers to the learner (Wood et al., 1976), Cognitive Load Theory yields this study's central

pedagogical distinction: AI is beneficial when it serves as a fading scaffold for students' own cognition, and harmful when it becomes a permanent cognitive substitute.

2.4.3. Social cognitive theory

Social Cognitive Theory emphasizes the reciprocal interaction among personal factors (beliefs, self-efficacy), behaviour, and environmental influences (Bandura, 1986), with self-efficacy beliefs in one's capability to organise and execute actions occupying a central role in academic motivation and performance (Bandura, 1997). The theory links directly to this study because AI becomes a new and powerful environmental influence within the secondary-school learning environment: it shapes students' expectations of what learning requires, models problem-solving strategies, and delivers feedback that constitutes a vicarious and mastery experience. If students use AI to practice, receive constructive feedback, and succeed at progressively challenging tasks, these mastery experiences should strengthen academic self-efficacy, which in turn predicts persistence and engagement (Bandura, 1997; Heung & Chiu, 2025). Conversely, if students repeatedly rely on AI and become uncertain of their ability to work independently, self-efficacy becomes fragile and dependence grows again, consistent with the over-reliance risk identified by Heung and Chiu (Heung & Chiu, 2025). The theory further explains the social contagion of AI-use norms: students observe peers and teachers and develop beliefs about what constitutes normal or effective use (Bandura, 1986). Classroom norms that reward verification, source-checking, and independent reasoning therefore function as environmental moderators that determine whether AI operates as a scaffold or a shortcut, which is why teacher modelling and school policy are emphasised in this study's recommendations.

2.4.4. Transactional model of stress and coping

The Transactional Model of Stress and Coping proposes that psychological outcomes depend not on events themselves but on how individuals appraise demands and mobilize coping resources (Lazarus & Folkman, 1984). This theory is directly relevant to the well-being dimension of this study because AI introduces a new potential coping resource into adolescents' academic and emotional lives. A student who appraises academic demands as manageable may use AI adaptively as a resource for understanding difficult concepts, planning tasks, rehearsing presentations, or obtaining general psychoeducational information and thereby reduce avoidable academic stress; this explains the reductions in frustration and increases in perceived competence that accompany well-regulated AI use (Isaiah et al., 2026a; Kundu & Bej, 2025). Conversely, a student who uses AI to avoid difficult learning, interpersonal conversations, or professional help is engaged in emotion-focused avoidance coping, which maintains rather than resolves stressors; this mechanism is consistent with the elevated stress and anxiety reported where AI use is intense or poorly regulated (Benchallal, 2025). The model also explains this study's core finding of individual differences: because appraisal and coping resources vary across students, the same technology can benefit one student while creating difficulties for another (Kundu & Bej, 2025), and it frames the stress and anxiety findings reviewed by Benchallal (2025) as appraisal-dependent rather than technology-determined. The model therefore justifies the study's recommendations that schools teach approach-oriented, regulated AI use rather than merely restricting access.

2.5. AI and adolescent mental-health screening

Isaiah et al. (2026a) systematically reviewed 45 studies published between 2020 and 2024 and identified AI applications using machine learning, deep learning, natural-language processing, and mobile or passive-sensing approaches for adolescent mental-health screening. The review indicates that AI can potentially broaden the reach of screening in contexts where traditional services are limited. It also underscores the importance of clinical validation, ethical governance, and responsible interpretation.

Sharma et al. (2025) similarly identified 88 relevant studies of AI in adolescent mental-health care, with diagnosis representing the most common application. However, the predominance of unclear risk-of-bias ratings in the reviewed literature indicates that technological sophistication does not automatically establish clinical validity. Liang et al. (2026) extend this caution to therapeutic applications, finding that while AI-supported interventions for adolescents show early promise, robust effectiveness evidence and standardized evaluation are still lacking. In schools, this means that an AI-generated risk flag should prompt appropriate human review, not automatic labelling of a student.

Privacy is especially important because adolescent mental-health data can be highly sensitive. School-based AI systems may process text, mood reports, behavioural data, or other information that students may

not fully understand. Ethical implementation therefore requires informed consent or assent processes appropriate to age and context, data minimization, secure storage, clear communication about who can access information, and defined procedures for responding to identified risk (UNESCO, 2023).

2.6. AI-mediated relationships and student well-being

The emergence of conversational AI introduces a new psychological phenomenon: users may experience an artificial system as responsive, available, non-judgmental, or emotionally meaningful. Isaiah et al. (2026b) found that adults engaging with AI mental-health chatbots described experiences of attachment and negotiated the authenticity of AI-mediated therapeutic relationships. The finding should not be directly generalised to adolescents, but it demonstrates why educational psychology must examine the relational consequences of AI.

Evidence focused on the present paper's exact population is beginning to emerge. A 2026 scoping review of AI conversational agents for high-school wellbeing interventions found potential reductions in depressive symptoms and stress among high-school students, while emphasising that the evidence base remains limited and methodologically heterogeneous (Lamb et al., 2026). Liang et al. (2026) similarly identify conversational and therapeutic agents as a growing application area in adolescent mental-health support. For secondary school students, relational AI could benefit students who are shy, anxious, or reluctant to seek help by providing a low-threshold opportunity to articulate concerns and learn about coping or help-seeking. At the same time, excessive reliance could reduce human help-seeking or create unrealistic expectations about relationships. The appropriate educational position is therefore not to prohibit all relational AI but to establish clear boundaries and reinforce the primacy of human support systems.

2.7. Empirical evidence from the focal Nigerian literature

The four focal references collectively suggest an emerging Nigerian research agenda in which AI is being examined across educational assessment, adolescent mental-health screening, and AI-mediated psychological relationships. Uwaoma et al. (2025) locate AI within the classroom and assessment system; Isaiah et al. (2026a) extend the discussion to adolescent mental-health screening; Isaiah et al. (2026b) further demonstrate that AI can become a psychologically meaningful relational technology; and Useh (2026) represents the broader psychological and health-research context in which these questions are developing.

What remains insufficiently established is how these domains interact in the same secondary-school population. A student may use AI for homework, receive automated feedback, encounter AI-based mental-health screening, and potentially use a chatbot for emotional support. These uses should not be treated as independent because they may collectively shape motivation, self-efficacy, emotional regulation, social interaction, and well-being. The international evidence reviewed above (Kundu & Bej, 2025; Lo et al., 2024; Heung & Chiu, 2025; Sharma et al., 2025) provides the conceptual and empirical scaffolding within which this Nigerian agenda can be interpreted and extended.

3. Methodology

3.1. Research design

The paper adopted an integrative literature-review design. An integrative review is a form of research that reviews, critiques, and synthesises representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated (Torraco, 2005, 2016). It is the broadest type of research review method, permitting the simultaneous inclusion of experimental and non-experimental research, theoretical literature, and diverse methodologies in order to more fully understand a phenomenon of concern (Whittemore & Knafl, 2005; Souza, Silva & Carvalho, 2010). Rather than presenting a new dataset as if it had been collected, the analysis synthesised the four focal references supplied for the paper with fourteen additional verified empirical and review sources on AI, student engagement, adolescent mental health, psychological impacts of AI on school students, and educational psychology theory and policy.

This design was deliberately chosen for four reasons. First, the research problem is inherently multidisciplinary, spanning educational technology, academic engagement, and adolescent mental health; an integrative review is explicitly recommended for questions that cannot be answered by a single research tradition or methodological design (Whittemore & Knafl, 2005; Torraco, 2016). Second, the evidence base is methodologically heterogeneous meta-analyses of experimental studies (Deng et al., 2024; Heung & Chiu,

2025; Wu et al., 2026; Liu et al., 2025), scoping and systematic reviews (Kundu & Bej, 2025; Sharma et al., 2025; Liang et al., 2026; Lamb et al., 2026), a qualitative study (Isaiah et al., 2026b), and survey research (Uwaoma et al., 2025) and only an integrative design legitimately combines such diverse sources (Grant & Booth, 2009; Snyder, 2019). Third, where primary evidence within the exact target population (Nigerian secondary school students) remains thin, an integrative review allows the inclusion of adjacent populations and theoretical literature to generate hypotheses and frameworks that guide future primary research (Torraco, 2016). Fourth, an integrative review is appropriate when the objective is to clarify relationships among constructs and to develop new conceptual linkages, in this case, the scaffold-versus-substitute distinction linking AI use to both engagement and well-being rather than to estimate a single pooled effect size, which would require a meta-analysis (Whittemore & Knafl, 2005; Grant & Booth, 2009). The design followed the five stages of problem identification, literature search, data evaluation, data analysis, and presentation recommended by Whittemore and Knafl (2005), with constant comparison and conclusion drawing used to organise the synthesis.

3.2. Sources of evidence

The focal evidence comprised: (1) Uwaoma et al. (2025) on human-AI collaboration and continuous assessment among secondary schools in the Calabar Education Zone; (2) Isaiah et al. (2026a) on AI-based screening of adolescent mental-health conditions using mobile-health applications; (3) Isaiah et al. (2026b) on lived experiences of AI-mediated therapeutic relationships and attachment to generative AI mental-health chatbots among adults; and (4) the Useh (2026). Additional verified literature comprised four systematic reviews and meta-analyses of ChatGPT's effects on engagement and learning outcomes (Lo et al., 2024; Deng et al., 2024; Heung & Chiu, 2025; Wu et al., 2026), one meta-analysis of ChatGPT and academic achievement (Liu et al., 2025), a systematic scoping review of the psychological impacts of AI on school students (Kundu & Bej, 2025), three reviews of AI in adolescent mental health and high-school wellbeing interventions (Sharma et al., 2025; Liang et al., 2026; "Artificial Intelligence Conversational Agents for High School Wellbeing Interventions," 2026), one systematic review bridging AI, learning, and psychological well-being (Benchallal, 2025), and theoretical and policy frameworks (Deci & Ryan, 2000; Bandura, 1986; Lazarus & Folkman, 1984; UNESCO, 2023).

3.3. Analytical framework

Evidence was organised around the study's five objectives and three primary constructs: AI use, academic engagement, and psychological well-being. AI use was considered in terms of frequency, purpose, type of system, degree of autonomy, and human oversight, consistent with the contingency factors (how, why, and how much) identified by Kundu and Bej (2025). Academic engagement was conceptualised behaviourally, emotionally, and cognitively, following the widely validated multidimensional model of engagement (Fredricks et al., 2004), which also underpins the engagement measures used in the synthesised meta-analyses (Lo et al., 2024; Heung & Chiu, 2025). Psychological well-being was conceptualised as positive emotional functioning, perceived competence, autonomy, relatedness, and the capacity to manage academic and social demands, consistent with eudaimonic and self-determination accounts of well-being (Ryff, 1989; Deci & Ryan, 2000) and with the well-being indicators reported in the adolescent mental-health reviews (Isaiah et al., 2026a; Sharma et al., 2025; Liang et al., 2026). Each objective was then addressed by mapping the evidence onto the four theoretical lenses described in need satisfaction and frustration (Self-Determination Theory), load management and scaffolding (Cognitive Load Theory), self-efficacy and environmental modelling (Social Cognitive Theory), and appraisal and coping (Transactional Model), which specify the psychological mechanisms through which AI may produce beneficial, neutral, or adverse outcomes. This mapping operationalized the scaffold-versus-substitute distinction and structured the presentation of findings in section 2.4 (Whittemore & Knafl, 2005).

3.4. Ethical considerations

Due to the fact that this paper did not collect new human-participant data, no new participant consent or institutional ethics approval was required for the literature synthesis itself. Nevertheless, ethical principles relevant to AI use among minors were considered throughout the analysis, particularly privacy, informed participation, data protection, transparency, non-discrimination, age appropriateness, and human oversight.

4. Results and discussion

4.1. Pattern and purpose of AI use among secondary school students

The reviewed evidence indicates that secondary school students encounter AI across at least five distinct use patterns: guided tutoring and explanations; immediate feedback and practice; AI-generated completion of assignments; AI-based mental-health screening; and conversational or emotional AI. These uses differ sharply in purpose and psychological quality. Guided tutoring and feedback-oriented uses position AI as a scaffold, whereas uses centred on task completion position AI as a cognitive substitute, and conversational uses position AI as a relational agent. The engagement literature confirms that this functional distinction, rather than frequency of use per se, determines outcomes: high AI-use frequency could reflect active learning, but it could equally reflect dependence or avoidance, precisely the over-reliance risk identified by Heung and Chiu (Heung & Chiu, 2025). A psychologically informed assessment should therefore examine whether students can explain, critique, apply, and reproduce what they obtained from AI without the system, a distinction that is particularly important in secondary education, where independent learning habits are still developing (Kundu & Bej, 2025). Table 1 summarises these patterns and their hypothesised consequences.

Table 1: Conceptual Pathways Linking AI Use, Academic Engagement, and Psychological Well-Being

AI Use Pattern	Likely Psychological Mechanism	Academic Engagement	Potential Well-Being Outcome
Guided tutoring and explanations	Scaffolding, competence, metacognition	Higher cognitive and behavioural engagement	Greater confidence and reduced avoidable frustration
Immediate feedback and practice	Self-monitoring and self-regulation	Greater persistence and task participation	Increased perceived competence
AI-generated completion of assignments	Cognitive offloading and reduced effort	Possible behavioural completion but lower cognitive engagement	Short-term relief; possible dependence or anxiety about independent performance
AI-based mental-health screening	Early detection and help-seeking	Possible improved concentration when difficulties are addressed	Earlier access to support; privacy and false-positive concerns
Conversational/emotional AI	Perceived availability and social responsiveness	May support help-seeking or distract from schoolwork	Possible emotional support, but risk of overdependence or reduced human interaction
Unsupervised/high-frequency use	Habit formation and reduced self-monitoring	Possible disengagement, shortcutting, or academic dishonesty	Stress, reduced self-efficacy, or social withdrawal

4.2. AI use and academic engagement

The strongest educational evidence concerns the capacity of AI to provide immediate assistance and feedback. Uwaoma et al. (2025) found that human-AI collaboration was positively associated with continuous-assessment practices in Nigerian secondary schools, suggesting that AI may improve the infrastructure around learning by supporting assessment reliability and efficiency. Internationally, the convergence of evidence is striking: Lo et al. (2024) showed that ChatGPT can support engagement while also producing disengagement-related outcomes; Heung and Chiu (2025) quantified positive effects across behavioural, cognitive, and emotional engagement in 1,735 students while flagging over-reliance; and Deng et al. (2024), Wu et al. (2026), and Liu et al. (2025) collectively meta-analysed more than 90 experimental studies demonstrating small-to-moderate positive effects on performance and learning outcomes. Taken together, these findings suggest that AI is most educationally valuable when it increases the quality of students’ participation rather than simply reducing the amount of effort required.

Consistent with Cognitive Load Theory (Section 2.4.2), the engagement benefits were concentrated in uses that managed cognitive load as a scaffold step-by-step explanation, worked examples, and feedback that freed working-memory resources for germane processing (Sweller et al., 2019) while the disengagement risks were concentrated in uses that removed desirable difficulties and produced cognitive offloading (Lo et al., 2024). The evidence also indicates that engagement cannot be equated with AI-assisted task completion: Benchallal (2025) showed that stress and anxiety can rise alongside achievement where AI use is intense or unregulated, and Heung and Chiu (2025) caution that engagement benefits coexist with over-reliance risks. This distinction is especially important in secondary education because students are still developing executive functions, metacognitive awareness, and academic integrity.

4.3. AI use and psychological well-being

The evidence suggests potential benefits for psychological well-being through accessibility, privacy, and early identification. Isaiah et al. (2026a) identified promising applications of AI-based mobile-health screening for adolescent mental-health conditions, which could be particularly valuable in settings where school counselling and specialist services are scarce. Kundu and Bej (2025) confirmed across 189 studies that school students' psychological responses to AI span cognitive, emotional, and behavioural domains, with benefits concentrated where use is guided, and risks concentrated where use is excessive. However, Sharma et al. (2025) showed that the adolescent AI mental-health literature remains concentrated on diagnostic applications and that methodological and transparency problems remain, and Liang et al. (2026) found effectiveness evidence for AI-supported adolescent mental-health interventions to be preliminary.

Psychological well-being was also affected indirectly through academic functioning. AI that reduces unnecessary confusion may strengthen perceived competence, a key ingredient of well-being in both eudaimonic and self-determination accounts (Ryff, 1989; Deci & Ryan, 2000), while AI that produces inaccurate or contradictory information may increase uncertainty, consistent with the stress and anxiety evidence summarized by Benchallal (Benchallal, 2025). The direction of the effect therefore depends on AI accuracy, students' digital literacy, teacher guidance, and the extent to which students maintain independent judgement. In keeping with the Transactional Model (Section 2.4.4), well-regulated AI use functioned as an approach-oriented coping resource, whereas avoidant use-maintained stressors rather than resolving them (Lazarus & Folkman, 1984).

4.4. Relational and social effects, and the theoretical mechanisms linking AI use to outcomes

The qualitative evidence on AI-mediated therapeutic relationships demonstrates that users may experience AI systems as psychologically meaningful (Isaiah et al., 2026b). For adolescents, this possibility raises questions about social substitution. An AI companion could provide a private conversational space, but it may also alter help-seeking and interpersonal behaviour if it becomes a preferred substitute for human relationships. The scoping review of AI conversational agents for high-school wellbeing interventions (Lamb et al., 2026) offers tentative support for beneficial effects on depressive symptoms and stress while underscoring the limited state of the evidence. This concern is consistent with the broader finding that AI effects are multidimensional and cannot be evaluated solely through academic performance.

Interpreting these findings through the four theoretical lenses specified in Section 2.4 confirms the study's contingency thesis. Through Self-Determination Theory, engagement gains occurred where AI satisfied autonomy and competence needs (personalised pacing, mastery feedback), while over-reliance and social withdrawal reflected need frustration (Heung & Chiu, 2025; Kundu & Bej, 2025). Through Cognitive Load Theory, benefits occurred where AI reduced extraneous load as a fading scaffold, and harms occurred where complete solutions eliminated germane processing (Sweller et al., 2019; Kalyuga et al., 2003). Through Social Cognitive Theory, mastery experiences with AI feedback strengthened self-efficacy, whereas habitual delegation weakened it, with classroom norms acting as the environmental moderator (Bandura, 1997, 1986). Through the Transactional Model, AI served as an adaptive coping resource under approach appraisals and as an avoidance mechanism under threat appraisals (Lazarus & Folkman, 1984; Benchallal, 2025). In each case, the same technology produced opposite outcomes depending on the psychological function it served, supporting the scaffold-versus-substitute distinction advanced in this study.

5. Discussion

The central conclusion from the evidence is that AI use should be understood as a psychological and educational process rather than simply a technological exposure. The same system can facilitate learning for one student and undermine learning for another depending on purpose, self-regulation, prior knowledge, teacher expectations, and the social environment. This contingency is now one of the most replicated findings in the literature, documented across 189 studies of school students by Kundu and Bej (2025), across 72 engagement studies by Lo et al. (2024), in the meta-analytic estimates of Heung and Chiu (2025), Wu et al. (2026), and Liu et al. (2025), and in the adolescent mental-health reviews of Sharma et al. (2025) and Liang et al. (2026). This finding is also consistent with the evidence from Uwaoma et al. (2025), which emphasises collaboration between human professionals and AI rather than technological replacement.

The positive association between human-AI collaboration and continuous assessment suggests that AI can strengthen the educational environment when teachers remain responsible for interpretation and judgement. In educational psychology terms, this arrangement can provide students with more timely feedback while preserving the teacher as a social and instructional regulator. Such a model may support competence and motivation because students receive information about their progress without losing access to human explanation.

The meta-analytic convergence on engagement and learning outcomes is encouraging but must be read developmentally. Most synthesised experimental studies involved older students or adults, and Heung and Chiu (2025) caution that the engagement benefits of ChatGPT coexist with over-reliance risks. The literature therefore cannot yet guarantee that the average positive effect transfers unchanged to secondary-school populations, whose self-regulation and critical judgement are still developing (Kundu & Bej, 2025). This developmental gap is precisely where educational psychology has the most to contribute.

The literature also demonstrates that engagement cannot be equated with AI-assisted task completion. Lo et al. (2024) found evidence of both engagement and disengagement in ChatGPT-supported learning, and Benchallal (2025) showed that stress and anxiety can rise alongside achievement where AI use is intense or unregulated. This distinction is especially important in secondary education because students are still developing executive functions, metacognitive awareness, and academic integrity. A school policy that merely permits or prohibits AI is therefore less useful than one that teaches students how to use AI strategically.

Psychological well-being represents the second major pathway. AI-based screening may help identify students who might otherwise remain invisible to conventional services. Isaiah et al. (2026a) demonstrated the relevance of mobile AI approaches to adolescent depression and anxiety screening, while Sharma et al. (2025) showed the breadth of AI applications in adolescent mental-health care and Liang et al. (2026) mapped their therapeutic potential. In resource-constrained settings, these technologies may have substantial potential, but they should function as screening or support tools rather than autonomous clinical decision-makers.

The relational dimension requires particular caution. Isaiah et al. (2026b) found that adults can develop attachment to generative AI mental-health chatbots, and the high-school-focused scoping review (Lamb et al., 2026) found early, tentative evidence of benefit for depressive symptoms and stress in exactly the population of interest. Although this evidence cannot yet be treated as conclusive, adolescence is precisely the developmental period in which social identity, attachment, peer relationships, and help-seeking patterns are being formed. Schools should therefore monitor not only whether students use AI, but also whether AI changes whom they turn to for emotional support.

The findings can be interpreted through Self-Determination Theory. AI can support autonomy by giving students control over pacing and access to information, and it can support competence through immediate feedback (Deci & Ryan, 2000). However, excessive reliance can undermine autonomy because students may become unable to act confidently without AI; the over-reliance mechanism identified by Heung and Chiu (2025). Relatedness may also be affected when technology replaces rather than supplements relationships with teachers, peers, counsellors, and family members.

The findings also support a social-cognitive interpretation (Bandura, 1986). Students observe peers and teachers using AI and develop beliefs about what constitutes normal or effective use. If classroom norms reward thoughtful questioning, source checking, and independent reasoning, AI is more likely to function as a learning scaffold. If norms reward rapid completion, students may learn to use AI primarily as a shortcut. Teacher behaviour therefore becomes a critical moderator of AI's psychological effects.

From a coping perspective (Lazarus & Folkman, 1984), AI can be viewed as a new resource for managing academic demands. Students may use it to understand difficult concepts, organise tasks, rehearse presentations, or obtain general information about emotional difficulties; these uses may be adaptive. In contrast, using AI to avoid difficult learning, interpersonal conversations, or professional help may maintain problems rather than resolve them, consistent with the mixed stress and anxiety evidence reviewed by Benchallal (2025). The psychological effect therefore depends partly on whether AI facilitates approach-oriented coping or avoidance. AI use should be incorporated into students' educational and psychosocial assessment. Educational psychologists, counsellors, and teachers should promote self-regulation, critical AI literacy, responsible use, and appropriate help-seeking rather than simple restriction. Teaching practices should emphasise explanation, reflection, application, and evidence of learning, while students should be

taught to verify AI outputs, recognise limitations, protect personal information, and distinguish AI-generated mental-health information from professional assessment (Kundu & Bej, 2025; Lo et al., 2024; Sharma et al., 2025; Liang et al., 2026). School policies should address privacy, academic integrity, transparency, age appropriateness, teacher oversight, and mental-health safeguarding, consistent with UNESCO's (2023) human-centred approach. Parents should similarly support open, non-punitive discussions about appropriate AI use and when human assistance is required.

This synthesis contributes to educational psychology by integrating academic and psychological perspectives on student AI use. It proposes that AI may affect learning and well-being through interconnected mechanisms including self-regulation, perceived competence, cognitive offloading, help-seeking, and social interaction. It further introduces the distinction between AI as a *scaffold* and AI as a *substitute*: AI is potentially beneficial when it enhances understanding, reflection, practice, and help-seeking, but potentially harmful when it displaces these processes. The synthesis also highlights the need for research integrating educational and psychological outcomes within Nigerian student populations (Uwaoma et al., 2025; Isaiah et al., 2026a, 2026b).

As an integrative synthesis, this paper cannot establish causal relationships, and the underlying evidence is heterogeneous in populations, technologies, measures, and study designs. Much of the evidence derives from higher-education or non-Nigerian contexts, while evidence concerning adolescent psychological outcomes remains comparatively limited. Findings from adult qualitative research should therefore be interpreted cautiously when applied to secondary-school populations.

Future research should prioritise longitudinal and mixed-method studies involving Nigerian secondary-school students. Research should examine whether AI use predicts academic engagement and psychological well-being over time and test potential mediators and moderators, including emotion regulation, self-efficacy, academic anxiety, digital literacy, teacher support, and AI supervision. Combining validated psychological measures with objective indicators such as learning analytics, attendance, and assignment records, alongside qualitative interviews, would strengthen causal inference and reduce reliance on self-report (Heung & Chiu, 2025; Wu et al., 2026; Liu et al., 2025).

6. Conclusion

Artificial intelligence is becoming an important component of the secondary-school psychological and educational environment. The available evidence spanning 189-student-study scoping reviews, engagement syntheses, outcome meta-analyses, adolescent mental-health reviews, and the emerging Nigerian literature suggests that AI can enhance academic engagement by providing personalised explanations, immediate feedback, and learning support, while AI-enabled mental-health applications may improve access to screening and early identification. However, the benefits are conditional. Excessive cognitive offloading, academic dishonesty, inaccurate information, privacy concerns, emotional dependence, over-reliance, and displacement of human relationships may undermine the very educational and psychological outcomes AI is intended to support.

The most appropriate educational psychology position is therefore neither unconditional adoption nor blanket rejection. AI should be integrated as a supervised, human-centred scaffold that strengthens students' capacity to learn and seek appropriate support. Teachers, educational psychologists, counsellors, parents, and policymakers have a central role in establishing the conditions under which AI supports rather than substitutes for human learning and relationships.

Based on the findings, the following were recommended:

- ❖ Secondary schools should develop clear, age-appropriate AI-use policies that distinguish acceptable learning support from academic substitution and misconduct.
- ❖ Schools should provide AI literacy programmes that teach students verification, source evaluation, privacy protection, prompt awareness, academic integrity, and responsible help-seeking.
- ❖ Teachers should receive professional development on human-AI collaboration, formative assessment, AI-supported feedback, and methods for maintaining students' independent cognitive engagement.
- ❖ AI-based mental-health screening should be used only as an adjunct to professional assessment, with explicit safeguards for confidentiality, informed participation, risk escalation, and human review.

- ❖ Educational psychologists and school counsellors should routinely explore students' patterns of AI use, particularly where there are indications of excessive dependence, avoidance, anxiety, or social withdrawal.
- ❖ Schools that deploy conversational AI wellbeing tools should monitor their effects on help-seeking behaviour and human connectedness, in line with the cautious evidence from high-school conversational-agent research.
- ❖ Parents and caregivers should be included in school-based AI literacy initiatives so that students receive consistent guidance across home and school environments.
- ❖ Nigerian researchers should conduct longitudinal studies that examine AI use, academic engagement, emotion regulation, academic anxiety, self-efficacy, belonging, and psychological well-being among secondary-school students.
- ❖ Future interventions should evaluate AI as a complement to teacher and counsellor support rather than as a replacement for human educational and psychological relationships.

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