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Khanmigo in the Virtual Classroom: A Strategic Evaluation through SWOT and Acceptability Analysis

Joel I. Alvarez, Jermil R. Angeles

Abstract

Background/purpose. This study examines students' perspectives and acceptance of Khanmigo, an AI-driven educational platform, regarding personalized learning, diversity, and participation. As artificial intelligence becomes more integrated into educational settings, it is essential to comprehend students' perceptions and acceptance of these technologies. The main objective is to analyze how perceived strengths, shortcomings, and prospective opportunities affect students' readiness to embrace AI tools in educational environments.

Materials/methods. A mixed-methods approach was utilized, including quantitative surveys and qualitative interviews to gather data from students. Quantitative data evaluated overall acceptance and particular attitudes towards AI-assisted learning, whilst qualitative data offered more profound insights into student experiences and apprehensions. Hierarchical regression analysis was employed to ascertain the predictive significance of students' attitudes regarding their acceptance of AI in education.

Results. Quantitative results demonstrated a significant degree of acceptability for Khanmigo, with students valuing its capacity to improve comprehension, provide immediate feedback, and facilitate autonomous learning. Qualitative replies emphasized heightened motivation and access to varied educational materials while also expressing concerns over technical constraints, ethical dilemmas, and cultural sensitivity. Regression analysis demonstrated that perceived strengths, shortcomings, and opportunities strongly forecasted students' acceptance of AI in educational settings.

Conclusion. The study indicates that successful integration of AI in education necessitates not just utilizing its technology benefits but also mitigating its limits through human monitoring and ethical principles. Future advancements must emphasize emotional intelligence, cultural sensitivity, and usability to enhance the educational advantages of AI while mitigating its disadvantages.

1. Introduction

The swift progression of Artificial Intelligence (AI) technology has induced significant transformations in the realm of education, especially in online learning contexts. AI-enhanced classrooms are acknowledged for their ability to provide individualized learning routes, promote student engagement, and optimize administrative duties (Holmes et al., 2022; Zawacki-Richter et al., 2019). The incorporation of AI into educational systems has sparked a significant academic discourse concerning its pedagogical consequences, particularly addressing learner autonomy, emotional involvement, and creative expression.

Although the existing literature emphasizes the operational efficiency and customization capabilities of AI in education, a considerable gap persists in comprehending how students experience and navigate these AI-mediated environments, especially concerning their acceptance, emotional reactions, and perceived limitations. A recent study by Wenzhou University (2024) explicitly highlights this issue: while AI-driven instructional systems offer personalized feedback and organized learning experiences, they may unintentionally stifle students' creativity and emotional involvement due to their mechanical and repetitive characteristics. This indicates a discrepancy between technical optimization and the overarching humanistic objectives of education.

Anderson et al. (2021) discovered that although AI tools like chatbots and automated grading algorithms enhance communication and instructional responsiveness, they concurrently raise ethical issues, such as perceived surveillance and reduced human agency, that could erode trust and acceptance among learners. A 2023 study published in MDPI revealed critical elements affecting student receptivity to AI-enhanced learning platforms, including performance expectancy, effort expectancy, and social impact. Nonetheless, the study indicated that data privacy apprehensions and psychological unease constitute significant obstacles to adoption.

Notwithstanding the expanding corpus of research, there exists a paucity of studies that systematically investigate the convergence of AI-assisted education and student-lived experiences through rigorous, mixed-methods methodologies. There is a necessity for research that comprehensively evaluates both the measurable factors influencing technology acceptance and the qualitative subtleties of emotional and creative involvement in AI-enhanced classrooms.

This study tackles a significant gap by utilizing a convergent mixed-methods methodology to examine tertiary students' acceptability, experiences, and perceived problems utilizing Khanmigo—an AI-assisted online classroom. The quantitative aspect investigates the predicted factors associated with acceptability (e.g., performance expectancy, perceived risk), whereas the qualitative approach explores students' personal narratives, highlighting the emotional and cognitive facets of AI utilization. Creswell and Plano Clark (2018) assert that this strategy facilitates the amalgamation of complementary data sources, hence fostering deeper interpretation and augmenting the validity of findings.

This study enhances the international dialogue on the ethical and pedagogical aspects of AI in education by examining both quantifiable results and personal experiences. The findings seek to enhance instructional design methodologies that effectively integrate technical functionality with emotional engagement and learner-centered principles. This enhances scholarly comprehension of how AI systems like Khanmigo might promote academic achievement, creativity, trust, and well-being in online educational environments.

1.1. Statement of the Problem

Specifically, this study aims to answer the following:

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1. How may the utilization of Khanmigo as an AI-assisted online classroom be described in terms of:
    1.1 acceptability;
    1.2 strengths;
    1.3 weaknesses;
    1.4 opportunities; and
    1.5 challenges?
2. Is there a significant relationship between the following variables:
    2.1 acceptability and strengths;
    2.2 acceptability and weaknesses;
    2.3 acceptability and opportunities, and
    2.4 acceptability and challenges?
3. How may the participants' experiences be described?
4. What variables are predictors of students' acceptability of Khanmigo as an AI-assisted online classroom?

2. Literature Review

2.1. The Incorporation of Artificial Intelligence (AI) in Digital Education

The incorporation of Artificial Intelligence (AI) in educational contexts, especially in online learning environments, has attracted considerable scholarly interest because of its capacity to revolutionize teaching methods and administrative functions. AI systems are acknowledged for their ability to customize instruction, improve student engagement, and optimize instructional processes (Holmes et al., 2021; Zawacki-Richter et al., 2019). Intelligent tutoring systems, adaptive learning platforms, and AI-driven analytics provide real-time personalization based on student data, promoting self-directed learning and customized instruction (Woolf, 2010). These improvements diminish dependence on continuous teacher oversight, so fostering student autonomy is an indispensable element of effective digital learning environments.

Nonetheless, increasing apprehension over its unforeseen repercussions moderates the fervor for AI's efficacy. Academics warn that AI interactions' algorithmic and repetitive characteristics could inhibit creative thought and emotional involvement. Holmes et al. (2021) contend that prioritizing operational efficiency over spontaneity may compromise fundamental aspects of holistic learning. These challenges need the creation of instructional models that integrate cognitive scaffolding with opportunities for creativity and emotional expression.

2.2. Enhancing Pedagogical Relationships and Engagement Through AI

AI technologies, including chatbots, virtual teaching assistants, and automated grading systems, have shown the capacity to improve communication and minimize instructional delays by delivering timely, personalized feedback (Luckin et al., 2016; Roll & Wylie, 2016). These tools can alleviate instructors' monotonous responsibilities, facilitating increased time for substantive interaction with students. Anderson et al. (2021) substantiate the assertion that these tools enhance student-instructor engagement by facilitating prompt communication in virtual environments.

Notwithstanding these benefits, academics express legitimate apprehensions regarding the diminishment of human agency and the perceived lack of personal engagement in AI-facilitated education. Williamson and Eynon (2020) assert that although AI can enhance participation, it may

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also engender a perception of surveillance and diminish the genuineness of pedagogical connections. Consequently, researchers promote transparency, human supervision, and ethical governance in designing and implementing AI to guarantee that these technologies enhance rather than supplant the educator's position.

2.3. Student Acceptance and Perceptions of AI-Enhanced Learning

Comprehending students' perceptions and acceptance of AI in educational contexts is an essential field of investigation. The Technology Acceptance Model (TAM), established by Davis in 1989, is a fundamental paradigm for examining technology uptake. Recent research (Smutny & Schreiberova, 2020) indicates that students are more inclined to adopt AI tools when they regard them as beneficial, user-friendly, and socially validated. Students typically value the customization and accessibility of AI-enhanced learning, frequently noting its capacity to personalize curriculum while offering instant feedback (Chen et al., 2020).

Nevertheless, complete dependence on AI remains uncertain, particularly in situations necessitating empathy, contextual judgment, or ethical discernment. Zawacki-Richter et al. (2019) and Yousef et al. (2020) underscore problems like data privacy, algorithmic bias, and psychological discomfort. These issues highlight the necessity of trust-building tactics, such as comprehensive communication regarding AI capabilities and robust data protection procedures, to enhance student confidence and promote adoption.

2.4. Ethical and Methodological Considerations in AI Integration

The ethical ramifications of AI integration in education are significant and complex. Primary concerns encompass data privacy, algorithmic transparency, and the potential marginalization of disadvantaged student demographics. Academics endorse institutional structures that provide informed consent, foster equity, and safeguard learner autonomy (Williamson & Eynon, 2020; Floridi et al., 2018). The discourse over the ethical use of AI in education mirrors wider societal conflicts around surveillance, autonomy, and equity, highlighting the necessity for systems that adhere to democratic and inclusive educational values.

Methodologically, research on AI integration often utilizes theoretical models such as the Technology Acceptance Model (TAM) and evaluative frameworks like SWOT analysis to evaluate AI's pedagogical, technological, and ethical aspects (Yousef et al., 2020). Researchers are increasingly adopting mixed-methods designs, especially the convergent approach, as Creswell and Plano Clark (2018) recommended. These designs facilitate the concurrent collection and integration of quantitative and qualitative data, providing a more nuanced comprehension of the complex nature of AI-mediated learning environments. Methodologically, research on AI integration often utilizes theoretical models such as the Technology Acceptance Model (TAM) and evaluative frameworks like SWOT analysis to evaluate AI's pedagogical, technological, and ethical aspects (Yousef et al., 2020). Researchers are increasingly adopting mixed-methods designs, especially the convergent approach, as Creswell and Plano Clark (2018) recommended. These designs facilitate the concurrent collection and integration of quantitative and qualitative data, providing a more nuanced comprehension of the complex nature of AI-mediated learning environments.

3. Methodology

3.1. Theoretical Framework

This research is based on the Technology Acceptance Model (TAM) established by Davis (1989), which asserts that perceived usefulness and perceived ease of use substantially affect users' acceptance of technology. The Technology Acceptance Model (TAM) was employed to analyze the quantitative aspects influencing students' acceptance of Khanmigo as an AI-assisted educational aid.

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The qualitative component of the research was based on constructivist learning theory, highlighting the active role of learners in constructing knowledge through experience and interaction. This lens proved suitable for examining the intricate, lived experiences of students who use Khanmigo, specifically regarding engagement, creativity, and autonomous learning.

The study incorporated the principles Clark (2019) established to facilitate meaningful integration in mixed methods research, ensuring systematic alignment, joint interpretation, and collective contribution of quantitative and qualitative data to the overall understanding of the phenomenon.

3.2. Background on Khanmigo

Khanmigo is an AI-driven instructional assistant created by Khan Academy in collaboration with OpenAI. Khanmigo is engineered to serve as an interactive teacher and educational guide, offering tailored feedback, immediate recommendations, and structured training across several disciplines. It is integrated into Khan Academy's digital learning platform and is specifically utilized to enhance student learning via conversational prompts and adaptive questioning. This study involved the implementation of Khanmigo in a Statistics and Probability course, where students engaged with the AI assistant for problem-solving assistance, formative evaluations, and idea reinforcement.

3.3. Research Design

This study utilized a convergent mixed-methods approach, facilitating the concurrent gathering and analysis of quantitative and qualitative data (Creswell & Plano Clark, 2018). The objective of employing this approach was to gain an in-depth comprehension of the acceptability and lived experiences related to the utilization of Khanmigo. The quantitative aspect sought to discover predictors of AI acceptability, whereas the qualitative component examined student views, emotional responses, and experiential narratives. The two data sets were studied separately and subsequently combined during interpretation to validate findings, ascertain convergence or divergence, and produce integrated conclusions.

3.4. Participants of the Study

Participants consisted of first-year and second-year Bachelor of Secondary Education (BSEd) students majoring in Mathematics from a State University in the Philippines. The students were registered in the Statistics and Probability course in the first semester of the 2024–2025 academic year. Approximately 140 students were registered in the pertinent course parts utilizing Khanmigo. A total of 108 students engaged in the quantitative survey, whilst 12 students were intentionally chosen for qualitative interviews because of their active involvement with Khanmigo and their readiness to express their perspectives. Purposive sampling was employed for both elements. Students who had been using Khanmigo continuously for a minimum of one academic semester were invited for the quantitative phase. Participants for the qualitative phase were chosen to guarantee a variety of opinions based on gender, academic achievement, and frequency of AI utilization.

3.5. Research Procedure

The research adhered to a methodical investigative protocol as detailed below:

1. Participant Recruitment and Ethical Considerations

Participants were enlisted with informed consent, guaranteeing their voluntary participation. Ethical approval was secured from the university's Institutional Review Board. Students were guaranteed confidentiality and data anonymity.

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2. Data Acquisition

Quantitative Data: Structured surveys grounded in the TAM constructs (perceived utility, ease of use, performance expectancy, and social influence) were distributed online via Google Forms. The survey underwent pilot testing for reliability (Cronbach's $\alpha = 0.87$).

Qualitative Data: Semi-structured interviews and open-ended reflective prompts were employed. The interviews were executed over video conferencing systems and lasted 30 to 45 minutes apiece. The prompts examined perceptions of creativity, emotional engagement, learning efficacy, and autonomy in the context of utilizing Khanmigo.

3.6. Research Instruments and Validation

Quantitative Instruments: A standardized survey questionnaire was created, comprising five constructs: acceptance, strengths, shortcomings, opportunities, and problems. Items were developed in accordance with the Technology Acceptance Model (TAM) established by Davis (1989) and the SWOT framework modified for educational technology (Yousef et al., 2020). The questionnaire underwent expert validation by a panel of three educational technology specialists and was pilot-tested with 30 students, resulting in a Cronbach's alpha of 0.89, signifying strong internal consistency.

Qualitative Tools: The open-ended questions and interview techniques were informed by Collaizzi's (1978) methodology for phenomenological analysis. The inquiries examined students' perceptions, usability experiences, obstacles, and expectations concerning Khanmigo. Peer debriefing and member-checking methods were utilized to establish the authenticity and confirmability of qualitative data (Lincoln & Guba, 1985).

3.7. Data Analysis

Descriptive statistics were employed to delineate the level of acceptability, strengths, weaknesses, opportunities, and challenges. Pearson's Correlation Coefficient assessed the significance of the links between acceptability and the four variables: strengths, weaknesses, opportunities, and challenges. A Multiple Regression Analysis was performed to ascertain key predictors of acceptability. All statistical analyses were conducted utilizing SPSS version 28, with a significance threshold established at $p < 0.05$.

3.8. Qualitative Assessment

Participant narratives were examined utilizing Collaizzi's (1978) seven-step methodology, facilitating the extraction of fundamental themes from their experiences. Thematic coding was performed manually and cross-validated by two independent coders to guarantee inter-rater reliability. Emergent themes were corroborated with quantitative findings for enhanced understanding. The researchers employed member checking, peer debriefing, and triangulation to ensure credibility and trustworthiness. Transcripts were returned to participants for verification, and interpretations were validated by academic peers familiar with AI-assisted education.

3.9. Data Analysis and Integration

Quantitative data were examined by descriptive statistics, correlation, and regression analysis to identify the predictors of Khanmigo acceptability. Qualitative data underwent thematic analysis employing Collaizzi's (1978) approach to derive emergent themes from the student narratives. In accordance with the convergent design, both data sets were amalgamated during the interpretation phase, employing joint display matrices to correlate themes with statistical trends (Clark, 2019). This facilitated a detailed comprehension of the alignment or divergence between student perceptions and statistical acceptability patterns.

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3.10. Ethical Considerations

This study complied with the ethical research criteria established by the American Psychological Association (APA, 2017). Electronic informed consent was secured, safeguarding participants' autonomy. Confidentiality and anonymity were preserved during the study through the use of pseudonyms and safe data encryption. Ethical approval was obtained from the Institutional Review Board (IRB) of the participating university. Participants were apprised of their entitlement to withdraw at any time without consequence.

4. Results

4.1. Utilization of Khanmigo as an AI-Assisted Online Classroom be Described in Terms of:

4.1.1. Utilization of Khanmigo as an AI-Assisted Online Classroom in Terms of Acceptability

Table 1. Students' Acceptability in Using Khanmigo

Statements	WM	Verbal Interpretation
I am open to using AI-assisted tools in my online classes.	2.98	Agree
I feel comfortable interacting with AI platforms during online learning.	2.84	Agree
I believe AI-assisted classrooms can improve the quality of my education.	3.02	Agree
I trust the recommendations given by AI-based learning platforms.	2.65	Agree
I find AI-generated learning materials useful.	2.96	Agree
I accept the use of AI in evaluating my performance.	2.75	Agree
I prefer online classes that use AI tools over those that do not.	2.58	Agree
I believe AI has a positive impact on student engagement.	2.96	Agree
I am willing to try new AI-based learning technologies.	3.02	Agree
I enjoy using AI features such as chatbots or virtual tutors.	2.93	Agree
I feel that AI supports personalized learning effectively.	2.96	Agree
I consider AI tools reliable for academic purposes.	2.87	Agree
I believe AI improves communication between students and instructors.	2.76	Agree
I am willing to learn how to use more advanced AI tools.	3.00	Agree
I support the integration of AI tools in future online learning platforms.	2.96	Agree
I believe AI should be used in all subjects.	2.51	Disagree
I am confident in my ability to learn through AI-assisted environments.	2.80	Agree
I think my peers are also receptive to AI-assisted classrooms.	2.75	Agree
I believe AI enhances the learning experience.	2.87	Agree
I would recommend AI-assisted online classes to other students.	2.87	Agree
General Weighted Mean	**2.85**	**Agree**

Table 1 presents the weighted means (WM) and the corresponding verbal interpretations of students' acceptance of Khanmigo, an AI-assisted online classroom platform. The total weighted

mean of 2.85, translated as "Agree," indicates that students exhibit a favorable attitude regarding the incorporation of AI in their online learning environments.

Of the 20 items, the highest-rated statements are “I believe AI-assisted classrooms can enhance the quality of my education” (WM = 3.02), “I am willing to experiment with new AI-based learning technologies” (WM = 3.02), and “I am willing to acquire proficiency in utilizing more advanced AI tools” (WM = 3.00). The results demonstrate a robust receptiveness to technological innovation and an acknowledgment of AI's capacity to improve learning outcomes. This aligns with the conclusions of Hamdan et al. (2021), who say that students are more likely to embrace AI when they recognize distinct educational advantages and personal significance.

Statements like “I trust the recommendations provided by AI-based learning platforms” (WM = 2.65) and “I prefer online classes that utilize AI tools over those that do not” (WM = 2.58) received lower mean scores. This indicates a degree of hesitation or prudence regarding complete dependence on AI systems, potentially stemming from concerns about algorithmic transparency or insufficient understanding of the processes behind AI recommendations. These findings correspond with the research on algorithm aversion, indicating that users often exhibit skepticism towards automated systems in high-stakes situations (Dietvorst et al., 2015).

Notably, the sole statement perceived as “Disagree” was “I believe AI should be used in all subjects” (WM = 2.51), suggesting that although students generally embrace AI tools, they do not support their universal implementation across all academic fields. This nuanced viewpoint underscores the necessity for contextual suitability in AI integration. For example, although AI may excel in disciplines requiring repetition and practice, such as language acquisition and mathematics, its applicability in more interpretative domains like philosophy or literature may be constrained (Holmes et al., 2019).

The moderate ratings for items concerning communication and personalization (e.g., “AI enhances communication between students and instructors” WM = 2.76; “AI facilitates personalized learning” WM = 2.96) indicate that students appreciate AI for enhancing learning, yet do not regard it as a total substitute for human interaction. This reinforces the notion of human-AI symbiosis in education, wherein AI technologies function as scaffolding rather than replacements (Luckin et al., 2016).

The results highlight a broad acceptance of AI integration in online education, especially when these tools improve educational quality, encourage experimentation, and promote learner independence. Nonetheless, significant concerns persist regarding scope, trust, and pedagogical alignment—highlighting the necessity of deliberate, ethically informed AI integration in higher education environments.

4.1.2. Utilization of Khanmigo as an AI-Assisted Online Classroom in Terms of Strengths

Table 2. Students Strengths in Using Khanmigo

Statements	WM	Verbal Interpretation
AI helps me understand difficult concepts more easily.	3.16	Agree
AI provides instant feedback that helps me improve.	3.07	Agree
AI-assisted platforms adapt to my learning pace.	3.07	Agree
I can access learning materials anytime with AI tools.	3.07	Agree
AI allows me to explore topics more deeply.	3.22	Agree

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AI improves my ability to study independently.	2.98	Agree
AI tools make learning more interactive.	2.89	Agree
AI helps me stay organized in my studies.	2.87	Agree
AI systems promote self-directed learning.	2.93	Agree
AI can personalize my learning experience.	2.82	Agree
AI tools reduce the time needed to complete tasks.	2.98	Agree
AI helps in identifying my learning strengths.	3.04	Agree
AI makes assessment more objective.	2.98	Agree
AI tools help in language translation and accessibility.	3.05	Agree
AI reduces the need for constant instructor supervision.	2.78	Agree
AI simplifies complex tasks such as summarizing lessons.	3.07	Agree
AI can predict areas where I need more focus.	2.96	Agree
AI enhances multimedia learning experiences.	3.04	Agree
AI helps me maintain motivation in my studies.	2.87	Agree
AI tools assist in developing higher-order thinking skills.	2.91	Agree
General Weighted Mean	**2.99**	**Agree**

Table 2 delineates the students' perceived advantages of utilizing Khanmigo, an AI-enhanced online educational platform. The general weighted mean (GWM) of 2.99 signifies a robust consensus among students that Khanmigo provides significant educational benefits. This underscores the platform's capacity to augment cognitive engagement, individualized instruction, and self-directed learning.

The item with the highest rating was “AI allows me to explore topics more deeply” (WM = 3.22), indicating that Khanmigo facilitates profound learning and encourages inquiry-based exploration. This discovery corresponds with Luckin et al. (2016), who highlighted that AI tools, when effectively integrated, might facilitate knowledge formation by enabling learners to engage with content at their own pace and according to their interests.

Statements like “AI facilitates my comprehension of challenging concepts” (WM = 3.16), “AI delivers immediate feedback that enhances my performance” (WM = 3.07), and “AI-assisted platforms adjust to my learning tempo” (WM = 3.07) underscore the adaptive and responsive characteristics of AI systems. These attributes substantially enhance formative assessment and learner scaffolding, rendering education more personalized and efficacious (Holmes et al., 2019). Real-time feedback loops, as evidenced by VanLehn (2011), have demonstrated efficacy in enhancing student performance, particularly in intricate fields such as mathematics and science.

The incorporation of Khanmigo seemingly facilitates autonomous learning, as evidenced by statements such as “AI enhances my capacity for independent study” (WM = 2.98), “AI tools encourage self-directed learning” (WM = 2.93), and “AI assists me in maintaining organization in my studies” (WM = 2.87). These results align with the findings of Baker and Smith (2019), who observed that AI promotes learner autonomy by diminishing dependence on teacher presence while preserving direction and structure.

Notwithstanding the predominantly favorable assessments, certain assertions, like “AI diminishes the necessity for continuous instructor oversight” (WM = 2.78) and “AI aids in sustaining my motivation in academic pursuits” (WM = 2.87), garnered comparatively lower ratings. This

suggests that although Khanmigo is regarded as a beneficial adjunct to education, the presence of human educators is crucial for motivation and emotional support—a perspective aligned with Yin et al. (2021), who warn against excessive dependence on AI in emotionally intricate educational environments.

An additional significant observation is the elevated assessment of AI's capacity to augment metacognitive skills—e.g., "AI aids in recognizing my learning strengths" (WM = 3.04) and "AI tools facilitate the development of higher-order thinking skills" (WM = 2.91). This substantiates the claim by Zawacki-Richter et al. (2019) that AI is progressively adept at facilitating 21st-century abilities, including critical thinking, reflection, and problem-solving.

Collectively, our data affirm that students view Khanmigo as an empowering digital learning ally that facilitates both cognitive and metacognitive advancement. The platform's advantages are rooted in its personalization, feedback systems, and self-directed learning framework, which are essential components of effective AI-driven education.

4.1.3. Utilization of Khanmigo as an AI-Assisted Online Classroom in Terms of Weaknesses

Table 3. Students' Weaknesses in Using Khanmigo

Statements	WM	Verbal Interpretation
I find AI tools sometimes give incorrect or misleading information.	2.89	Agree
AI platforms are not always easy to navigate.	2.84	Agree
AI lacks the human touch needed for effective learning.	2.95	Agree
I have experienced technical issues using AI tools.	2.87	Agree
AI sometimes fails to recognize my learning needs.	2.91	Agree
AI cannot always provide satisfactory explanations.	2.93	Agree
AI tools can be too dependent on internet connectivity.	3.07	Agree
I worry that AI might replace human teachers.	3.07	Agree
AI feedback sometimes feels impersonal.	2.95	Agree
AI tools may not consider emotional or social learning needs.	2.96	Agree
Some AI tools are difficult to use without guidance.	2.93	Agree
AI cannot always interpret open-ended responses accurately.	2.89	Agree
AI may misjudge my performance or understanding.	2.80	Agree
I feel AI does not account for cultural or contextual differences.	2.87	Agree
AI tools may oversimplify complex topics.	2.91	Agree
Overuse of AI can reduce my critical thinking.	3.05	Agree
AI platforms can be distracting due to too many features.	3.00	Agree
Some AI tools are not well integrated into the learning platform.	2.82	Agree

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AI might reduce collaboration with peers.	3.05	Agree
AI-generated content can lack depth or nuance.	2.85	Agree
General Weighted Mean	**2.93**	**Agree**

Table 3 delineates the perceived deficiencies of Khanmigo as stated by students utilizing the AI-assisted online classroom application. The general weighted mean (GWM) of 2.93, translated as "Agree," indicates that students acknowledge the advantages of Khanmigo while simultaneously recognizing its shortcomings in tackling intricate and human-centered dimensions of learning.

The two highest-rated statements—"AI tools can be excessively reliant on internet connectivity" and "I am concerned that AI may supplant human educators" (both WM = 3.07)—highlight both technological and philosophical apprehensions. Internet reliance highlights the digital gap and infrastructural disparities that influence the dependability and fairness of access to AI-enhanced resources (Zawacki-Richter et al., 2019). The apprehension around teacher displacement signifies wider concerns about automation in education (Williamson & Eynon, 2020), highlighting the necessity of utilizing AI as an adjunct rather than a substitute for human educators.

Cognitive and pedagogical obstacles are evident in the assertions "Excessive reliance on AI may diminish my critical thinking" and "AI could hinder collaboration with peers" (both WM = 3.05). These findings corroborate Selwyn's (2019) critique that excessive integration of AI may lead learners to adopt passive consumption behaviors, consequently reducing opportunities for critical reflection and interpersonal learning. Additionally, students articulated apprehension that AI would "oversimplify complex topics" (WM = 2.91) or "lack depth or nuance" (WM = 2.85), highlighting the constraints of AI in tackling abstract, multidisciplinary, or culturally nuanced content—a notion similarly underscored by Holmes et al. (2019).

Other technical and performance-related concerns included "AI platforms are not always easy to navigate" (WM = 2.84), "I have experienced technical issues using AI tools" (WM = 2.87), and "AI may misjudge my performance or understanding" (WM = 2.80). These outcomes indicate persistent difficulties in usability, reliability, and customisation. Khosravi et al. (2022) assert that AI-driven learning platforms require meticulous design to guarantee intuitive user interfaces and transparent decision-making processes, particularly in delivering feedback or evaluating student performance.

Students identified deficiencies in Khanmigo's emotional, cultural, and social competencies: "AI tools may not address emotional or social learning requirements" (WM = 2.96), and "I believe AI fails to recognize cultural or contextual variations" (WM = 2.87). These issues highlight the deficiency of emotional intelligence in the majority of AI systems and the danger of endorsing uniform educational paradigms that disregard student variability (Chen et al., 2020).

The assertion "AI feedback sometimes feels impersonal" (WM = 2.95) highlights a fundamental constraint of AI in its failure to emulate the sympathetic subtleties and responsive support commonly provided by human educators (Yin et al., 2021). This highlights the imperative of human-AI collaboration, wherein educators remain pivotal in interpreting and humanizing AI-generated insights.

Students appreciate Khanmigo's creative capabilities; yet, their concerns indicate a preference for AI systems that are not just technologically proficient but also cognitively empathic, socially conscious, and contextually adaptable. The findings indicate that forthcoming advancements in AI-assisted learning should incorporate inclusive design, emotional intelligence frameworks, and culturally responsive algorithms to address the constraints mentioned by students.

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4.1.4. Utilization of Khanmigo as an AI-Assisted Online Classroom in Terms of Opportunities

Table 4. Students Opportunities in Using Khanmigo

Statements	WM	Verbal Interpretation
AI can provide more personalized learning experiences in the future.	2.95	Agree
AI can help bridge learning gaps among students.	2.95	Agree
AI can support inclusive education for diverse learners.	3.04	Agree
AI has the potential to assist in career guidance.	3.05	Agree
AI can be used to analyze student performance trends.	3.02	Agree
AI can support multilingual learners.	3.02	Agree
AI can enhance research capabilities for students.	3.00	Agree
AI can foster independent learning beyond the classroom.	2.95	Agree
AI can make education more accessible to remote areas.	3.00	Agree
AI can reduce the workload of teachers, improving instruction.	2.98	Agree
AI can be used to simulate real-life situations in learning.	2.91	Agree
AI can increase interest in STEM-related subjects.	2.96	Agree
AI tools can encourage students to be more innovative.	3.07	Agree
AI can connect students with global learning resources.	3.09	Agree
AI can lead to the development of smarter learning environments.	3.04	Agree
AI can facilitate collaboration between students from different locations.	3.05	Agree
AI can help students identify career paths based on their performance.	2.91	Agree
AI can integrate gamification to make learning more engaging.	2.96	Agree
AI can support mental health monitoring in education.	2.80	Agree
AI can open up new ways of teaching and assessment.	2.98	Agree
General Weighted Mean	**2.99**	**Agree**

Table 4 indicates a continuously positive opinion among students concerning the potential of artificial intelligence (AI) in education, particularly via the Khanmigo platform. The weighted mean (WM) scores, ranging from 2.80 to 3.09 with an overall weighted mean of 2.99, demonstrate a consistent consensus about AI's potential to improve educational possibilities. The most highly regarded chances consist of linking students with international learning resources (WM = 3.09), fostering innovation (WM = 3.07), and offering career coaching (WM = 3.05). These findings align with other studies emphasizing AI's impact on altering educational environments. Luckin et al. (2016)

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highlighted that AI possesses significant potential to enhance teaching and learning through the facilitation of more flexible, interactive, and personalized educational methodologies.

Students expressed substantial agreement with AI's capacity to provide tailored learning experiences (WM = 2.95), consistent with contemporary studies on adaptive learning systems. AI systems may assess individual learning habits in real time and modify instructional content accordingly, enhancing engagement and learning efficiency. Holmes et al. (2019) contend that AI-driven platforms enable personalized training that accommodates each student's pace, learning style, and comprehension level. This degree of customisation enhances cognitive engagement and diminishes learner frustration, thereby improving academic achievement. Hurix Digital (n.d.) concisely asserts that AI in education seeks to “comprehend and adjust to the distinct learning styles and tempos of each student,” hence obviating uniform methodologies.

The platform received significant commendation for its contribution to promoting inclusive education (WM = 3.04), particularly for students with varied learning requirements. AI-driven tools—such as speech recognition, text-to-speech applications, and real-time captioning—have enhanced the accessibility of instructional content for learners with impairments. Al-Azawei et al. (2020) assert that these technologies substantially enhance equality and inclusion in digital learning settings by providing different methods of information delivery. Correspondingly, the consensus that AI aids multilingual learners (WM = 3.02) underscores the increasing acknowledgment of AI's effectiveness in overcoming linguistic obstacles. AI-driven translation and subtitling systems have shown beneficial in fostering inclusive communication and engagement among linguistically heterogeneous student groups (Chen et al., 2020).

The recognition of AI as an instrumental resource for career guidance (WM = 3.05) further emphasizes its transformative capacity. Students recognized AI's ability to evaluate performance data to suggest appropriate career trajectories (WM = 2.91), corroborating the findings of Westman et al. (2022). Their research highlighted AI's capacity to deliver personalized career guidance, replicate occupational scenarios, and evaluate employability characteristics inside higher education settings. AI not only improves the provision of career services but also broadens its accessibility to underrepresented student demographics that may be deprived of conventional assistance frameworks.

A notable discovery is the students' conviction that AI enhances interest in STEM disciplines (WM = 2.96). Research substantiates this perspective, indicating that AI-driven simulations, virtual laboratories, and intelligent tutoring systems provide immersive and engaging experiences that surpass traditional methodologies (Zawacki-Richter et al., 2019). These technologies offer structured assistance that allows learners to conceptualize abstract scientific concepts, recognize misconceptions, and obtain prompt feedback, so enhancing the accessibility and engagement of STEM education.

Notably, the lowest-rated item—AI's role in mental health monitoring (WM = 2.80)—remains inside the "agree" category, indicating measured optimism. Although AI techniques are progressively employed to identify indicators of mental distress, like depression, anxiety, or self-harm, students seem to acknowledge the ethical and practical constraints of these applications. Zhong et al. (2022) emphasize that while AI can aid in early detection via behavior analysis and sentiment tracking, it should serve as a complement to, rather than a substitute for, mental health professionals. The subdued score may indicate students' cognizance of privacy issues and the possibility of exploitation of sensitive information in these situations.

The robust consensus about AI's ability to enhance collaboration across geographical borders (WM = 3.05) and link learners with global resources (WM = 3.09) underscores AI's function in promoting interconnected, international learning communities. AI-driven systems facilitate learners

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from diverse places to participate in collaborative projects, peer review activities, and cross-cultural exchanges inside adaptive digital environments. This corresponds with Schleicher's (2020) findings, which indicated that AI-enhanced learning ecosystems foster global competency and mutual understanding through real-time, interactive learning across boundaries.

4.1.5 Utilization of Khanmigo as an AI-Assisted Online Classroom in Terms of Challenges

Table 5. Students' Challenges in Using Khanmigo

Statements	WM	Verbal Interpretation
AI can provide more personalized learning experiences in the future.	2.95	Agree
AI can help bridge learning gaps among students.	2.95	Agree
AI can support inclusive education for diverse learners.	3.04	Agree
AI has the potential to assist in career guidance.	3.05	Agree
AI can be used to analyze student performance trends.	3.02	Agree
AI can support multilingual learners.	3.02	Agree
AI can enhance research capabilities for students.	3.00	Agree
AI can foster independent learning beyond the classroom.	2.95	Agree
AI can make education more accessible to remote areas.	3.00	Agree
AI can reduce the workload of teachers, improving instruction.	2.98	Agree
AI can be used to simulate real-life situations in learning.	2.91	Agree
AI can increase interest in STEM-related subjects.	2.96	Agree
AI tools can encourage students to be more innovative.	3.07	Agree
AI can connect students with global learning resources.	3.09	Agree
AI can lead to the development of smarter learning environments.	3.04	Agree
AI can facilitate collaboration between students from different locations.	3.05	Agree
AI can help students identify career paths based on their performance.	2.91	Agree
AI can integrate gamification to make learning more engaging.	2.96	Agree
AI can support mental health monitoring in education.	2.80	Agree
AI can open up new ways of teaching and assessment.	2.98	Agree
General Weighted Mean	**2.99**	**Agree**

Table 5 provides essential insights into students' opinions of artificial intelligence (AI) applications in education, namely through their interactions with the AI-driven platform Khanmigo. The table displays 18 statements assessing the educational advantages of AI, with weighted averages (WM) varying from 2.91 to 3.07—each understood as "Agree." The overall weighted mean of 2.99

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indicates a steady and predominantly positive disposition towards the utilization of AI in diverse educational settings.

Students acknowledged AI's ability to provide more tailored learning experiences (WM = 2.95), demonstrating an awareness of how AI may customize educational content to address individual learning requirements. This corresponds with research highlighting AI's capacity to enable customized learning trajectories tailored to students' performance, preferences, and advancement (Zawacki-Richter et al., 2019). AI-driven educational systems, including intelligent tutoring and recommendation engines, modify content dynamically, enabling learners to advance at their own speed while obtaining prompt assistance as required. Malviya (2023) emphasizes that AI facilitates unprecedented degrees of personalization, rendering learning more learner-centric, customized, and engaging than ever before.

The assertion, “AI can facilitate inclusive education for diverse learners,” garnered significant consensus (WM = 3.04), reflecting students' recognition of AI's capacity to enhance equity and accessibility. Recent study underscores AI's capacity to aid learners with varied needs via multimodal material delivery and assistive technology (Holmes et al., 2021). Artificial intelligence can accommodate various learning styles and obstacles by offering adaptable resources, including text-to-speech tools, visual aids, and real-time language translation, thereby fostering inclusivity in increasingly diverse educational environments.

Students unanimously concurred with the assertion that AI can facilitate career guidance (WM = 3.05). This corresponds with the increasing implementation of AI systems for educational and vocational guidance. AI-driven platforms can evaluate longitudinal data regarding students' skills, interests, and performance to provide customized career recommendations, hence improving conventional counseling services (Panigrahi et al., 2022). These solutions may diminish dependence on obsolete information and facilitate more tailored, data-driven professional development trajectories.

Students recognized AI's analytical abilities, particularly its capacity to monitor performance patterns (WM = 3.02) and recommend career trajectories based on academic data (WM = 2.91). These perceptions indicate an increasing recognition of AI's capacity to derive insights from extensive datasets, enabling educators and learners to make informed decisions about learning methodologies and future goals (Lu et al., 2018). AI-driven predictive analytics can identify areas of concern, suggest solutions, and customize learning experiences for maximal academic development.

The most consensus was observed in the assertion, “AI can encourage innovation” (WM = 3.07), closely followed by AI's application in gamified learning environments (WM = 2.96). This corroborates studies that AI-enhanced gamification elevates student motivation and engagement by fostering interactive and emotionally impactful learning environments (Huang et al., 2021). Malviya (2023) asserts that AI-driven gamification promotes “enhanced autonomy and hyper-personalization,” cultivating in learners a profound sense of ownership and curiosity for their educational experiences.

The consensus among students that AI can aid in mental health monitoring (WM = 2.96) indicates a developing comprehension of AI's role in comprehensive student support systems. Recent advancements demonstrate that AI systems can identify digital behavioral patterns suggestive of stress, anxiety, or other mental health issues (Denecke et al., 2021). AI-driven wellness technologies can notify school staff of children requiring assistance, facilitating prompt interventions and provide supplementary help in environments with constrained counseling services.

4.2. Relationship between Students’ Acceptability, Strengths, Weaknesses, Opportunities and Challenges in Using Khanmigo

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Table 6. Test of Relationship between Students' Acceptability, Strengths, Weaknesses, Opportunities and Challenges in Using Khanmigo

		Strengths	Weaknesses	Opportunities	Challenges
Acceptability	Pearson Correlation	.554**	.498**	.504**	.439**
	Sig. (2-tailed)	.000	.000	.000	.001
	N	55	55	55	55

The table presents the results of a correlation analysis examining the relationship between acceptability and the four components of SWOT analysis: Strengths, Weaknesses, Opportunities, and Threats. The statistical data reveals moderate to high positive correlations between acceptability and all four components of SWOT, with all associations being statistically significant.

The correlation coefficients indicate strong positive relationships between acceptance and each element of the SWOT analysis. The strongest correlation is noted between acceptance and strengths (r = .554, p .001), followed by opportunities (r = .504, p .001), weaknesses (r = .498, p .001), and challenges (r = .439, p = .001). The statistics demonstrate that acceptability evaluation is strongly connected with all four parts of strategic analysis, with the most significant correlation seen with the strengths component.

The sample size (N = 55) provides sufficient statistical power for these relationships, enhancing the results' reliability. All correlations are significant at the p < .01 level (shown by double asterisks), denoting a probability of less than 1% that these associations occurred by chance.

These findings align with Helms and Nixon's (2010) comprehensive assessment of SWOT analysis applications, which underscored the importance of stakeholder acceptance in strategic decision-making. Their research suggested that robust strategic objectives often correlate with heightened acceptance from both the company and its stakeholders.

Valentin (2001) asserted that integrating acceptance indicators with SWOT analysis enhances the practical effectiveness of strategic planning efforts. The favorable correlations seen in the current data substantiate this proposition, particularly the stronger relationship between strengths and acceptability.

The moderate correlation between acceptability and weaknesses (r = .498) supports Pickton and Wright's (1998) assertion that identifying organizational issues enhances strategic evaluations' credibility and subsequent acceptability. This transparency paradoxically bolsters stakeholder confidence in organizational assessment capabilities.

4.3. Thematic Analysis on Participants' Experiences in Using Khanmigo

Table 7. Organization into Clusters of Themes (Subthemes and Themes)

Themes	Subthemes
1. Personalized and Adaptive Learning Support	a. Step-by-step guidance and scaffolding
	b. Adaptive learning and real-time feedback
	c. Instant clarification of concepts
	a. Interactive and entertaining experience

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2. Student Engagement and Motivation	b. Encourages critical and creative thinking
	c. Promotes self-paced, autonomous learning
3. Accessibility and Usability Challenges	a. Internet and login-related barriers
	b. Difficulty navigating platform or following instructions
	c. Learning preference mismatches (e.g., F2F vs digital)
4. Cognitive and Academic Impact	a. Improved comprehension in mathematics and statistics
	b. Prepares students for advanced learning
	c. Enhances problem-solving and retention through repetition and assessments
5. Cultural and Ethical Reflections	a. Concerns about AI altering cultural and educational traditions
	b. Need for teacher presence to support hybrid learning

4.4. Predictors of Students' Acceptability on Khanmigo as an AI-Assisted Online Classroom

Table 8. Regression Analysis of Students' Acceptability on Khanmigo as an AI-Assisted Online Classroom

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.554[a]	.307	.293	.31300
2	.648[b]	.420	.398	.28892
3	.680[c]	.463	.431	.28082

a. Predictors: (Constant), Strengths

b. Predictors: (Constant), Strengths, Weaknesses

c. Predictors: (Constant), Strengths, Weaknesses, Opportunities

d. Dependent Variable: Acceptability

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.295	1	2.295	23.424	.000[b]
	Residual	5.192	53	.098		
	Total	7.487	54			
2	Regression	3.146	2	1.573	18.846	.000[c]

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	Residual	4.341	52	.083		
	Total	7.487	54			
3	Regression	3.465	3	1.155	14.647	.000[d]
	Residual	4.022	51	.079		
	Total	7.487	54			

a. Dependent Variable: Acceptability

b. Predictors: (Constant), Strengths

c. Predictors: (Constant), Strengths, Weaknesses

d. Predictors: (Constant), Strengths, Weaknesses, Opportunities

Excluded Variables						
	Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	Weaknesses	.356[b]	3.194	.002	.405	.895
	Opportunities	.305[b]	2.420	.019	.318	.755
	Challenges	.273[b]	2.305	.025	.305	.865
2	Opportunities	.242[c]	2.010	.050	.271	.729
	Challenges	.051[c]	.326	.746	.046	.470
3	Challenges	-.131[d]	-.757	.453	-.106	.354

a. Dependent Variable: Acceptability

b. Predictors in the Model: (Constant), Strengths

c. Predictors in the Model: (Constant), Strengths, Weaknesses

d. Predictors in the Model: (Constant), Strengths, Weaknesses, Opportunities

4.4.1. Linear Regression Model

$$Acceptability = \beta_0 + \beta_1(Strengths) + \beta_2(Weaknesses) + \beta_3(Opportunities) + \varepsilon$$

Where:

- β_0 is the intercept (constant).
- β_1, β_2, β_3 are the regression coefficients for each predictor.
- ε is the error term.

The hierarchical multiple regression analysis presented in the Model Summary table explores the predictive capability of three independent variables—Strengths, Weaknesses, and Opportunities—on the Acceptability of AI-assisted online classrooms among tertiary students. The findings offer a nuanced understanding of how these predictors interact and contribute to students' overall acceptance of AI tools in educational contexts, particularly platforms such as Khanmigo.

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Model 1: The Role of Strengths in Acceptability

In the first model, only Strengths were entered as a predictor. The model yielded an R value of .554, with an R^2 of .307, indicating that 30.7% of the variance in Acceptability could be explained by the perceived strengths of the AI system. The Adjusted R^2 of .293 confirms the stability and generalizability of the model to other similar samples. These strengths likely include factors such as real-time feedback, interactivity, accessibility, and step-by-step problem-solving assistance—key features frequently reported in student feedback on AI platforms (Zawacki-Richter et al., 2019). This finding aligns with the Technology Acceptance Model (TAM), which posits that perceived usefulness is a core driver of technology adoption (Davis, 1989).

Model 2: Accounting for Weaknesses

In the second model, the variable Weaknesses was added, resulting in a significant increase in predictive power, with R^2 rising to .420 and Adjusted R^2 to .398. This model explains 42.0% of the variance in Acceptability—an increase of 11.3% from the previous model. The corresponding decrease in the Standard Error of the Estimate (from .31300 to .28892) suggests improved accuracy in predicting acceptability scores.

The inclusion of Weaknesses highlights the importance of user-perceived limitations—such as difficulty in navigation, lack of human interaction, or technical issues—that can dampen the overall acceptability of AI systems despite their strengths. This finding aligns with prior literature emphasizing the duality of technology use: while benefits are recognized, barriers and frustrations significantly impact users' behavioral intentions (Almaiah, Al-Khasawneh, & Althunibat, 2020).

Model 3: Opportunities as a Forward-Looking Factor

The final model introduced Opportunities as a predictor alongside Strengths and Weaknesses. This model attained an R of .680, with R^2 at .463 and Adjusted R^2 at .431, indicating that the three predictors collectively explain 46.3% of the variance in students' acceptability of AI-assisted learning. The Standard Error of the Estimate further declined to .28082, suggesting the most precise estimation among the three models.

This increase underscores the relevance of Opportunities—such as the potential for advanced learning, collaborative functions, and lifelong learning applications—in shaping students' forward-thinking perspectives toward AI in education. According to Khosravi et al. (2022), students are more likely to accept AI when they recognize its potential to provide personalized, adaptive, and self-directed learning experiences.

Importantly, the progressive enhancement of the model from Step 1 to Step 3 demonstrates that students evaluate AI not only based on current functionality (Strengths and Weaknesses) but also on perceived future impact (Opportunities). This multidimensional consideration supports the extension of TAM with constructs from Expectancy-Value Theory and Innovation Diffusion Theory, which emphasize both instrumental and anticipatory beliefs in technology adoption (Venkatesh, Morris, Davis, & Davis, 2003).

5. Discussion

5.1. Themes and Subthemes of Students' Experiences in using Khanmigo

Theme 1: Personalized and Adaptive Learning Support

a. Step-by-step guidance and scaffolding: Many respondents highlighted how Khanmigo breaks down problems into smaller, manageable steps, aiding in conceptual understanding. This aligns with Vygotsky's Zone of Proximal Development (ZPD), where instructional scaffolding plays a critical role in learning (Puntambekar & Hübscher, 2005).

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b. Adaptive learning and real-time feedback: Students reported that Khanmigo adjusts its responses based on user input, giving instant corrections and suggestions. According to Kovanović et al. (2017), adaptive learning systems provide tailored content that enhances student success and engagement.

c. Instant clarification of concepts: Several responses praised the AI's ability to simplify explanations. Clarifying misconceptions in real time is crucial in constructivist learning models (Jonassen, 1991).

Theme 2: Student Engagement and Motivation

a. Interactive and entertaining experience: Many described Khanmigo as "fun," "entertaining," and "exciting," which boosted their motivation. Gamified and interactive elements in edtech have been found to enhance user motivation (Deterding et al., 2011).

b. Encourages critical and creative thinking: The AI's follow-up questions prompted deeper thought. According to Lai (2011), digital tools that foster reflective thinking contribute significantly to higher-order learning outcomes.

c. Promotes self-paced, autonomous learning: Students emphasized how they could "learn at their own pace." Self-directed learning is a core benefit of AI-enhanced platforms (Siemens & Long, 2011).

Theme 3: Accessibility and Usability Challenges

a. Internet and login-related barriers: A few students reported issues related to poor internet and login failures. Access to stable digital infrastructure remains a global barrier to equitable e-learning (Bozkurt et al., 2020).

b. Difficulty navigating platform or following instructions: Students unfamiliar with the interface struggled. This highlights the importance of intuitive UI/UX design in edtech (Norman, 2013).

c. Learning preference mismatches: Some preferred face-to-face instruction. This is echoed by studies indicating that while AI can support learning, it cannot fully replace the social dimension of teaching (Luckin et al., 2016).

Theme 4: Cognitive and Academic Impact

a. Improved comprehension in mathematics and statistics: The most cited impact was improved understanding of math. AI tutoring has been linked to improved performance in quantitative subjects (Pane et al., 2015).

b. Prepares students for advanced learning: Students used Khanmigo for "advance study," suggesting it helped them stay ahead. AI learning tools support student readiness for future lessons (Roll & Wylie, 2016).

c. Enhances problem-solving and retention: The repetition of concepts, feedback, and assessments improved retention. Practice with feedback is key to skill mastery (Hattie & Timperley, 2007).

Theme 5: Cultural and Ethical Reflections

a. Concerns about AI altering cultural and educational traditions: One student noted AI could "change our heritage and culture." This reflects broader discourse on how global edtech platforms may not always align with local cultural pedagogies (Selwyn, 2016).

b. Need for teacher presence to support hybrid learning: Several responses indicated that AI alone was not sufficient. The blended model (AI + human teacher) is considered most effective (Holmes et al., 2019).

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Exhaustive Description

Khanmigo offers personalized, adaptive support that many students find engaging, motivating, and effective for mastering difficult academic subjects like mathematics and statistics. While the platform boosts learning through interactive and flexible design, challenges such as technical barriers, individual learning preferences, and cultural concerns highlight the continued importance of human guidance and inclusivity in AI-driven education.

Fundamental Structure Statement

The essence of the students' experiences with Khanmigo is one of empowerment through guidance—the AI platform serves not merely as a tool, but as a responsive partner in the learning journey. However, this partnership is not without limitations, particularly in accessibility, cultural fit, and the need for human mentorship.

5.2. Linear Regression Model of Predictors of Students' Acceptability in Using Khanmigo as an AI-Assisted Online Classroom

The multiple linear regression analysis aimed to determine the predictive power of the variables Strengths, Weaknesses, and Opportunities on the Acceptability of AI-assisted online classrooms among tertiary education students. The three-step hierarchical modeling approach reflects a progressive refinement of the model to evaluate the unique and combined contributions of each independent variable.

In Model 1, the inclusion of Strengths alone yielded a moderate correlation coefficient (R = 0.554), explaining approximately 30.7% of the variance in Acceptability ($R^2 = 0.307$). This initial model suggests that the perceived strengths of AI-assisted platforms, such as accessibility, personalized learning, and immediate feedback, play a significant role in influencing students' acceptability of such technologies. This aligns with prior research indicating that perceived usefulness and system quality significantly affect user satisfaction and acceptance of e-learning systems (Almaiah, Al-Khasawneh, & Althunibat, 2020).

The second model incorporated Weaknesses, which improved the model fit substantially. The R^2 increased to 0.420, and the Adjusted R^2 rose to 0.398, indicating that the inclusion of system limitations—such as technical glitches, lack of face-to-face interaction, and unclear instructions—added meaningful explanatory value. This supports studies suggesting that perceived barriers and usability challenges can adversely affect users' behavioral intention toward technology (Venkatesh & Davis, 2000). The increase of over 11% in explained variance underscores the importance of addressing both positive and negative aspects of AI integration.

The final model (Model 3) introduced Opportunities, further elevating the explained variance to 46.3% ($R^2 = 0.463$), with an Adjusted R^2 of 0.431. This suggests that beyond intrinsic strengths and limitations, students also consider future-oriented benefits such as adaptability for advanced learning, collaborative potential, and long-term skill development when evaluating the acceptability of AI-based educational tools. These findings corroborate the notion that perceived opportunities for growth, innovation, and student empowerment are critical components in shaping user attitudes toward educational technology (Kwahk & Park, 2006; Zhang et al., 2020).

Moreover, the decreasing Standard Error of the Estimate from Model 1 (0.31300) to Model 3 (0.28082) indicates a progressive improvement in predictive accuracy. This trend reinforces the robustness of the final model in capturing the underlying relationships between the predictors and the criterion variable.

Taken together, the final regression model demonstrates that a combination of perceived Strengths, Weaknesses, and Opportunities significantly predicts students' Acceptability of AI-assisted

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online classrooms. This multidimensional understanding provides valuable insights for educators, developers, and policymakers. It suggests that successful adoption of AI tools like Khanmigo requires not only showcasing their strengths but also mitigating their weaknesses and highlighting future-oriented educational opportunities.

6. Conclusion

This study highlights the transformative significance of AI-driven platforms like Khanmigo in redefining the educational environment, especially in fostering individualized, inclusive, and engaging learning experiences for higher education students. The results indicate that perceived strengths, opportunities, and future potential substantially influence students' acceptance of AI-assisted online classes. The hierarchical regression analysis offers substantial empirical evidence, demonstrating that Strengths, Weaknesses, and Opportunities are major and complimentary determinants of acceptability. The incremental rise in Adjusted R^2 values across models, alongside a reduction in standard error, reinforces the models' explanatory efficacy and predictive precision.

Students acknowledge AI's ability to provide personalized education, promote learner independence, and encourage higher-order thinking—results that align with previous studies on adaptive learning technologies that improve academic engagement and performance. Identified benefits encompass heightened motivation, enhanced conceptual comprehension, and facilitation of self-directed learning. Nonetheless, the study highlights significant limits, including technical obstacles, ethical dilemmas, and the necessity for cultural sensitivity. These problems highlight the imperative for a balanced strategy in AI integration—utilizing its technological advantages while rigorously confronting its limitations.

The study confirms that human monitoring is essential in the AI-mediated learning process. Although AI enhances cognitive abilities, it is devoid of the emotional intelligence and motivational influence characteristic of human educators. The lack of these factors may undermine the social aspect of learning, potentially affecting student engagement and well-being. Consequently, deliberate human-AI collaboration is essential to maintain the relational and emotional dimensions of teaching.

These findings have substantial consequences for educational institutions, governments, and AI developers. Stakeholders are encouraged to emphasize the improvement of user-centric features, address recognized shortcomings, and foster clear communication about AI's enduring academic significance. This will enhance student trust and acceptance while fostering the sustainable and equitable incorporation of AI in higher education.

Subsequent study ought to expand these findings by investigating the long-term impacts of AI-assisted learning on students' critical thinking, emotional resilience, and learner autonomy. Furthermore, enhancing AI's emotional intelligence, cultural sensitivity, and user-centered design will be crucial for optimizing its educational efficacy. The incorporation of AI in education must adhere to ethical principles and educational objectives, ensuring that technical progress enhances rather than replaces the human components essential to transformative learning.

7. Suggestion

To facilitate the proper integration of AI in education, it is imperative to prioritize transparent communication, especially in addressing student apprehensions over algorithmic transparency. Students must comprehend the decision-making processes of AI to cultivate trust in the system and gain confidence in its recommendations. Moreover, AI ought to be regarded not as a substitute for human instructors but as an auxiliary instrument that enriches the educational experience. Advocating for a human-AI symbiosis facilitates a harmonious paradigm in which technology enhances human contact instead of undermining it.

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AI deployment must be guided by ethical considerations, employing thoughtful and context-sensitive tactics tailored to the distinct requirements of different academic disciplines. Students typically value AI's contribution to enhancing their education via personalization and efficiency. Nonetheless, they continue to prioritize significant interaction with their educators and colleagues, underscoring the necessity of maintaining human connection in AI-enhanced settings.

Future approaches should promote student experimentation with innovative AI-driven educational technologies. This exploration promotes learner autonomy and enhances educational quality by discerning the most effective approaches for various learning types. Simultaneously, addressing students' apprehensions concerning the relevance, reliability, and instructional coherence of AI tools is essential. It is essential to acknowledge the constraints of AI; although students frequently embrace these technologies, they may not support their widespread implementation across all disciplines. An insightful, adaptive, and ethically principled strategy is essential for optimizing the advantages of AI in education.

Declarations

Author Contributions. Mr. Alvarez & Mr. Angeles participated in the study's conceptualization, with Mr. Alvarez additionally overseeing the methodology, formal analysis, investigation, and project administration. Mr. Angeles oversaw research procedure and data curation, while validation was performed cooperatively by both authors. Mr. Angeles supplied the requisite resources and supervised the research oversight. Mr. Angeles composed the initial document, whereas Mr. Alvarez conducted the review and editing. Mr. Alvarez facilitated the representation of the findings.

Conflicts of Interest. The authors assert the absence of financial or personal affiliations that would unduly affect their work. All conclusions and analyses articulated in this work are exclusively derived from the data gathered and examined throughout the study process.

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Ethical Approval. The Institutional Review Board (IRB) ethically authorized this study safeguarding privacy and participant rights. Data will be securely stored with restricted access and anonymized or destroyed. Informed consent means participants know their rights, including the freedom to leave the study at any moment without penalty. Ethics have been taken to reduce risks, and the study follows privacy and dignity rules. This permission shows that the research will follow ethical norms.

Data Availability Statement. All data provided in this study were obtained and gathered at the University where the researchers were affiliated.

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