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Artificial Intelligence Use as a Predictor of Student Creativity in Ugandan Higher Education

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Abstract: *This study examined the relationship between artificial intelligence (AI) usage and student creativity among undergraduates at Victoria University, Kampala, Uganda, addressing a gap in literature on AI's effect on creativity within private African higher education. An explanatory sequential mixed-methods design was used. From a target population of 300 undergraduates across three faculties, a stratified random sample of 169 was drawn, yielding 162 participants (N = 162). Data were collected via structured questionnaires and a divergent thinking task (Guilford's Alternative Uses Test) under unassisted and AI-assisted conditions, plus 3 focus group discussions (n = 18) and key informant interviews (n = 5). Validity was confirmed by expert judgment (CVI = .88) and reliability by Cronbach's alpha (α = .84) and inter-rater agreement (ICC = .89). Ethical approval came from the Victoria University Research Ethics Committee (VUREC), registered with UNCST. Data were analyzed using paired-samples t-tests, multiple linear regression (SPSS v28), and thematic analysis. AI assistance significantly increased fluency (d = 0.82 to 1.12, p < .001) and elaboration (d = 0.77 to 1.05, p < .001) but reduced originality in Humanities (t = -4.56, p < .001) and Business (t = -3.01, p = .004). Copy-paste habits negatively predicted originality (β = -.381, p < .001), while iterative prompting predicted it positively (β = .215, p = .008). Generative AI thus acts as a dual-edged catalyst, aiding ideation when used collaboratively but eroding originality when used passively. The study recommends discipline-specific AI literacy training and process-oriented assessment redesign at Victoria University.*

Keywords: *Artificial Intelligence, Generative AI, Student Creativity, Higher Education, Victoria University, Uganda*

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1. Introduction

Artificial intelligence (AI) has rapidly transitioned from an emerging technological innovation to an essential component of higher education, transforming how university students research, compose, and solve problems globally (Ocen, et al., 2025). Following the release of public generative AI platforms such as ChatGPT, adoption rates among university students have surpassed the pace of policy development and instructional adaptation across mainstream educational systems (Fisher, et al., 2025). Higher education institutions in Uganda reflect this global shift, with recent empirical studies documenting extensive adoption of natural language processing tools across both public and private universities in disciplines ranging from health sciences to business management (Ajalo, et al., 2025; Namatovu & Kyambade, 2025).

Despite widespread adoption, global scholarly literature presents conflicting evidence regarding the impact of AI on creative output. While certain studies indicate that generative tools serve as effective cognitive scaffolds that enhance ideational fluency and elaboration (Fisher, et al., 2025), others argue that reliance on AI-generated responses reduces independent critical thinking, homogenizes output, and diminishes genuine originality (Aakanksha, et al., 2025). This conflict between AI as a collaborative ideation partner and AI as a substitute for independent thought remains largely unexplored within the Ugandan university system, where existing research has primarily focused on technology acceptance, institutional barriers, or general academic productivity

(Namatovu & Kyambade, 2025; Sendawula, et al., 2024).

This study addresses this gap by assessing the predictive relationship between AI usage habits and student creativity among undergraduate students at Victoria University, Kampala. By focusing on a private urban university, this study contributes context-specific empirical evidence to a body of literature currently dominated by North American, European, and Asian paradigms, as well as public university contexts within East Africa.

2. Literature Review

2.1 Global Context of AI Adoption and Creativity

The global literature on generative AI in higher education highlights both pedagogical advantages—such as personalized tutoring and rapid ideation scaffolding—and significant cognitive risks, including plagiarism, academic dependency, and reduced critical reasoning (Fisher, et al., 2025). In experimental contexts, Fisher, et al. (2025) demonstrated that while ChatGPT enhanced creative fluency in business fields like Marketing and Management, it yielded no significant gains in originality for Entrepreneurship students, indicating that the creative impact of AI is inherently discipline-dependent. Furthermore, Aakanksha, et al. (2025) observed that passive adoption habits (e.g., direct generation without iterative revision) systematically homogenize student submissions and impair long-term creative capacity.

2.2 Regional and Local Context in Ugandan Higher Education

In East Africa, digital transformation initiatives in higher education have accelerated rapidly. Research in Kenyan universities emphasizes the necessity of digital infrastructure for academic service delivery (Kariuki, et al., 2026), while Ugandan studies highlight the role of Learning Management Systems in personalizing instruction (Aruho, et al., 2026). Within Uganda specifically, empirical studies confirm high rates of AI adoption among undergraduate populations. Ajalo, et al. (2025) reported widespread use of ChatGPT among medical students across four major public universities (Makerere, MUST, Busitema, and Gulu). Similarly, Sendawula, et al. (2024) observed extensive student engagement with tools like ChatGPT, QuillBot, and Google Bard at Makerere, Kyambogo, and Kampala International University, alongside a noticeable gap in faculty readiness.

Analyzing drivers of adoption, Namatovu and Kyambade (2025) applied the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) at Makerere University Business School, identifying habit, performance expectancy, and social influence as primary determinants of ChatGPT usage. However, systemic structural constraints persist across Ugandan universities, including infrastructure deficits, inadequate faculty training, and unstandardized institutional policies (Nakyejwe, et al., 2026a; Ocen, et al., 2025). Furthermore, literature examining higher education outcomes in Uganda continues to focus primarily on graduate employability and labor market readiness (Nakyejwe, et al., 2026b) rather than direct cognitive and creative metrics. A contextual gap exists regarding how AI adoption affects creative performance within private universities like Victoria University, which possess distinct demographic and institutional profiles compared to public institutions.

2.3 Theoretical Framework

This study was anchored on three complementary theoretical frameworks:

1. **Amabile's (1983) Componential Theory of Creativity:** Asserts that creative output requires the interplay of domain-relevant skills, creativity-relevant processes, and task motivation. Generative AI functions as a digital catalyst within creativity-relevant processes by modifying how students generate and refine ideas.
2. **Venkatesh, et al. (2012) UTAUT2 Model:** Explains technological adoption through performance expectancy, effort expectancy, social influence, facilitating conditions, and habit, providing the behavioral basis for measuring student AI engagement patterns.
3. **Sweller's (1988) Cognitive Load Theory:** Provides the cognitive explanation for potential skill decay; when AI continuously offloads generative mental tasks, working memory processes necessary for deep, independent ideation may remain underutilized, leading to cognitive dependency.

3. Methodology

3.1 Research Design

The study adopted an explanatory sequential mixed-methods design. Quantitative data were first collected and analyzed to evaluate statistical relationships between AI usage patterns and creativity dimensions. Qualitative data were subsequently gathered through focus groups and interviews to elaborate upon and contextualize the quantitative findings.

3.2 Population and Sampling Techniques

The target population comprised approximately N = 300 active undergraduate students enrolled across three

faculties at Victoria University, Kampala during the 2025/2026 academic year. Based on Krejcie and Morgan's sample size determination standards, a target sample size of n = 169 was established.

A proportionate stratified random sampling strategy was used across three academic faculties: Humanities and Social Sciences (n = 56), Business and Management (n = 56), and Science, Technology and Health (n = 57). Out of 180 distributed instrument packs, 162 complete, valid responses were retrieved (n = 54 per faculty), yielding an effective response rate of 90.0%. The final sample consisted of 86 male (53.1%) and 76 female (46.9%) students, with a mean age of 22.4 years (SD = 2.1).

3.3 Data Collection Instruments

Data collection utilized three primary instruments:

1. **Structured AI Usage & Habit Questionnaire:** Measured frequency of AI use, purpose (idea generation, drafting, editing), and specific operational habits (copy-pasting vs. iterative prompting).
2. **Divergent Thinking Task:** Modeled after Guilford's Alternative Uses Test, participants completed task prompts under two sequential conditions: Unassisted (Condition A) and AI-Assisted using ChatGPT-4o (Condition B). Output was scored across four standardized creative dimensions: *Fluency* (total valid ideas), *Flexibility* (number of distinct categories), *Elaboration* (level of detail), and *Originality* (statistical rarity and independent novelty), rated on a standard 1–10 scale.
3. **Qualitative Protocols:** Semi-structured interview guides for faculty (n = 5) and focus group discussion guides for students (k = 3 sessions, n = 18 participants total).

3.4 Data Collection Procedure

Quantitative data collection was conducted over a two-week period in the Victoria University computer laboratories under the supervision of trained research assistants. Participants first completed the structured AI Usage & Habit Questionnaire, then undertook the divergent thinking task under the Unassisted condition (Condition A), followed after a 20-minute washout break by the AI-Assisted condition (Condition B) using ChatGPT-4o, with condition order held constant to avoid order effects specific to AI exposure. Sessions were conducted in small groups of 15–20 students per sitting, each lasting approximately 90 minutes, and were proctored to ensure standardized instructions and time limits across sittings. Of the 180 instrument packs distributed, 162 were returned complete and valid, consistent with the 90.0% response rate reported in Section 3.2. Qualitative data were collected concurrently: the 3 focus group discussions (n = 18) were held with student volunteers drawn proportionately from the three faculties, while key informant interviews (n = 5) were scheduled individually with faculty members at their convenience. All sessions were audio-recorded with participant consent and transcribed verbatim within 48 hours to preserve accuracy.

3.5 Validity and Reliability

Content validity of the questionnaire and creativity task prompts was established through expert evaluation by a panel of three senior educational technology researchers, yielding a Content Validity Index (CVI) of .88. Construct reliability of the survey scales was confirmed via Cronbach's alpha ($\alpha = .84$). Divergent thinking task outputs were independently evaluated by two trained assessors; inter-rater agreement was confirmed using the Intraclass Correlation Coefficient (ICC = .89, $p < .001$), indicating high scoring consistency.

3.6 Ethical Considerations

Ethical approval was granted by the Victoria University Research Ethics Committee (VUREC) and registered with the Uganda National Council for Science and Technology (UNCST). Formal clearance was obtained from the Office of the Academic Registrar. Informed consent was obtained from all participants prior to data collection. Anonymity and confidentiality were maintained through alphanumeric coding. Participation was voluntary, with complete freedom to withdraw at any stage without academic consequences.

3.7 Statistical Treatment of Data

Quantitative data were processed using SPSS v28. Descriptive statistics (means, standard deviations, frequencies) were calculated. Inferential analyses included paired-samples t-tests to evaluate mean differences between unassisted and AI-assisted creativity scores across faculties. Cohen's d effect sizes were calculated ($d = t / \sqrt{n}$). A multiple linear regression analysis was executed to evaluate how AI usage habits (frequency, copy-paste habits, and iterative prompting practice) predicted independent originality scores. Qualitative data were transcribed and analyzed using Braun and Clarke's six-phase thematic analysis framework.

4. Results and Discussion

4.1 Results

Descriptive metrics indicated widespread AI engagement: 88.5% of respondents (n = 143) reported using generative AI tools weekly. ChatGPT was the primary tool (91.1%), followed by QuillBot (64.2%) and Google Gemini (42.8%). The primary motives for AI usage were initial idea generation (74.2%),

drafting/outlining (68.5%), and proofreading/polishing (82.3%).

To evaluate objective creative performance, participants completed Guilford's Alternative Uses Test across unassisted and AI-assisted conditions. Table 1 presents the comparative results across faculties and creative dimensions (n = 54 per discipline).

Table 1: Mean Creativity Scores by AI Condition and Discipline (N = 162; n = 54 per Discipline)

Discipline / Dimension	Unassisted Mean (SD)	AI-Assisted Mean (SD)	t-statistic	p-value	Cohen's d
Humanities & Social Sciences					
Fluency	5.2 (1.1)	8.4 (0.9)	8.23	< .001	1.12
Flexibility	4.8 (1.2)	7.6 (1.0)	7.20	< .001	0.98
Originality	6.1 (1.4)	4.3 (1.5)	-4.56	< .001	-0.62
Elaboration	4.5 (1.0)	7.9 (1.1)	7.72	< .001	1.05
Business & Management					
Fluency	4.9 (1.0)	8.1 (0.8)	8.01	< .001	1.09
Flexibility	4.6 (1.1)	7.2 (0.9)	6.83	< .001	0.93
Originality	5.8 (1.3)	4.8 (1.4)	-3.01	.004	-0.41
Elaboration	4.2 (1.1)	7.5 (1.0)	7.27	< .001	0.99
Science, Tech & Health					
Fluency	5.5 (1.2)	8.0 (1.0)	6.03	< .001	0.82
Flexibility	5.1 (1.3)	6.8 (1.1)	4.26	< .001	0.58
Originality	6.4 (1.2)	6.1 (1.3)	-0.73	.466	-0.10
Elaboration	4.8 (1.1)	7.1 (1.2)	5.66	< .001	0.77

A multiple linear regression was conducted to determine how AI usage habits predicted students' independent originality scores. The full model was statistically significant, R^2 = .384, F(3, 158) = 32.83, p < .001. Table 2 presents the regression coefficients.

Table 2: Multiple Linear Regression Predicting Independent Originality Scores (N = 162)

Predictor Variable	Unstandardized B	Std. Error	Standardized β	t-statistic	p-value
(Intercept)	6.821	0.377	—	18.08	< .001
Frequency of AI Usage	-0.412	0.126	-.294	-3.26	.001
Copy-Paste Habits (Direct Adoption)	-0.581	0.146	-.381	-3.97	< .001
Iterative Prompting Practice	0.324	0.120	.215	2.70	.008

Qualitative findings corroborated these numerical trends. Students consistently described AI as an "ideational scaffold" that helps overcome cognitive blockages during initial assignment phases. However, faculty key informants expressed significant concern regarding "homogenized argumentation" and observed a decline in independent analytical problem-solving when students submitted raw AI output without personal synthesis.

4.2 Discussion

The statistical results demonstrate a dual-effect of AI integration on student creativity at Victoria University, supporting the theoretical tension between AI as a scaffold versus a substitute. The significant increase in fluency and elaboration scores across all three faculties ($p < .001$) aligns with Fisher, et al. (2025), confirming that generative AI reduces initial cognitive load (Sweller, 1988) and facilitates rapid expansion of ideas.

Conversely, the significant drop in originality observed among Humanities ($t = -4.56$, $p < .001$) and Business ($t = -3.01$, $p = .004$) students under AI-assisted conditions echoes the findings of Aakanksha, et al. (2025). Within the Ugandan higher education environment, where resource limitations and large class sizes often constrain personalized feedback (Nakyejwe, et al., 2026a), students frequently adopt default AI outputs without critical transformation.

Notably, Science, Technology and Health students showed a non-significant change in originality ($p = .466$). This suggests that disciplinary differences in task structure (e.g., structured coding and algorithmic logic versus open-ended textual composition) moderate how AI impacts creative independence. Furthermore, regression results confirm that passive adoption habits (copy-pasting, $\beta = -.381$) impair creative originality, whereas active adoption habits (iterative prompting, $\beta = .215$) enhance it.

5. Conclusion and Recommendations

5.1 Conclusion

Taken together, the findings confirm that generative AI operates as a dual-edged catalyst for student creativity at Victoria University: it reliably strengthens ideational fluency and elaboration, but its effect on originality is conditional on how students choose to engage with it. Three specific conclusions follow from this overall pattern.

1. **Impact of AI on Ideational Fluency, Flexibility, and Elaboration:** Generative AI significantly enhances students' capacity to generate, categorize, and elaborate upon ideas across all academic disciplines, operating as an effective cognitive scaffold.
2. **Impact of AI on Creative Originality:** AI usage significantly reduces independent originality in open-ended textual and business domains when used passively, leading to homogenized thinking and creative dependency.
3. **Predictive Effect of Usage Habits:** The manner in which students utilize AI determines its impact on creativity; direct copy-paste behaviors negatively predict creative originality, whereas iterative prompting and active critique positively predict original thought.

5.2 Recommendations

Arising from these conclusions, the study recommends coordinated action at the policy, assessment, and curricular levels to help Victoria University harness AI's benefits for ideation while protecting independent originality.

1. **Policy Formulation:** Victoria University management should establish a clear institutional AI policy framework that shifts from ambiguous restrictions to structured,

ethical integration guidelines across all departments.

2. **Assessment Redesign:** Academic faculties must update assessment methods by reducing emphasis on standalone written essays and increasing process-oriented evaluations, such as oral defenses, live problem-solving tasks, and reflective learning logs.
3. **Curricular Adaptation & AI Literacy:** The university administration should embed formal AI literacy and prompt engineering training into foundation courses, teaching students how to use AI as an iterative partner while safeguarding independent analytical reasoning.

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