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EFFECTS OF GENERATIVE ARTIFICIAL INTELLIGENCE ON STUDENTS' LEARNING BEHAVIOUR: EVIDENCE FROM THE UNIVERSITY OF IRINGA AND MKWAWA UNIVERSITY COLLEGE OF EDUCATION, TANZANIA

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ABSTRACT

This study examined the effects of Generative Artificial Intelligence (GenAI) on students' learning behaviour at the University of Iringa (UoI) and Mkwawa University College of Education (MUCE), Tanzania, focusing on class attendance, participation in group learning activities and use of library facilities. Guided by the Technology Acceptance Model, a mixed-methods, cross-sectional design was used. A stratified random sample of 122 students completed a structured questionnaire, and qualitative data were collected through ten key informant interviews with lecturers, librarians and deans of students and two focus group discussions. Data were analysed using descriptive statistics, chi-square tests and thematic analysis. Awareness of GenAI was 96.7% and 78.7% of students used it daily, mainly ChatGPT. Reduced lecture attendance was reported by 62.8% of students and 70.8% felt less motivated to attend physically, yet 89.0% used GenAI to prepare for class; the attendance effect differ by frequency of use ($\chi^2 = 4.424$, $p = 0.0469$). GenAI shaped group participation for 91.0% of students, improving preparation and confidence while weakening joint reasoning, and daily users were more likely to use GenAI to prepare for group work ($\chi^2 = 11.764$, $p = 0.001$). Although 87.6% reported reduced dependence on the library, 75.0% still used library resources for credibility and citation, and daily users were more likely to believe that GenAI could replace the library ($\chi^2 = 7.208$, $p = 0.027$). GenAI is reshaping rather than replacing these behaviours and recommends institutional GenAI guidelines, redesigned teaching and assessment, and library-led verification training.

KEYWORDS: Generative artificial intelligence; Learning behaviour; Class attendance; Group learning; Academic library use; Tanzania

1. INTRODUCTION

1.1 Background of the Study

Generative Artificial Intelligence (GenAI) is a branch of artificial intelligence that produces new content, including text, images, code and analytical outputs, in response to prompts written in everyday language (Banh & Strobel, 2023; Dwivedi et al., 2023). Since the public release of ChatGPT in November 2022, tools such as ChatGPT, Google Gemini and Microsoft Copilot have become freely or cheaply available on smartphones and laptops, and universities worldwide have been pressed to respond to their rapid uptake by students (UNESCO, 2023). GenAI can personalise explanations and improve understanding of complex concepts (Kasneci et al., 2023; Mhlanga, 2023), but unguided use has also been linked to reduced mental effort, weaker critical thinking and over-dependence on automated systems (Zhai et al., 2024).

International evidence on how GenAI use relates to learning behaviour is mixed. In a survey of 72,615 undergraduates in China, academic use of GenAI was associated with higher cognitive engagement but lower behavioural engagement and lower learning interest (Guo et al., 2025). In a field experiment with nearly 1,000 secondary school mathematics students, unrestricted access to a GPT-4 tutor improved performance during practice but lowered performance by 17% once access was withdrawn, whereas a version with learning safeguards largely avoided that harm (Bastani et al., 2025). A systematic review of 14 studies similarly associated over-reliance on AI dialogue systems with weaker critical and analytical thinking (Zhai et al., 2024). These studies show that GenAI does not affect all learning behaviours in the same direction and that outcomes depend on how the tools are used and regulated.

In East Africa, studies document rapid acceptance alongside uneven institutional readiness. Ajalo et al. (2025) reported widespread use of ChatGPT among medical students at public universities in Uganda, and Nantale et al. (2025) found that Ugandan students used AI tools as an individual first source of information before engaging with peers. In Tanzania, Stuart (2024) reported 77% awareness and 65% use of AI among students at Kampala International University in Tanzania, Matto (2024) found that about 81.5% of 200 students at two universities used ChatGPT for examinations, assignments and research reports while reporting weaker critical thinking and academic integrity, and Mollel (2025) found that

ChatGPT was used by 85.7% of 238 students at the Tanzania Institute of Accountancy, mainly for writing assignments and generating ideas. Mambile and Mwogosi (2024) identified personalised learning and time savings as benefits, and academic misconduct and reduced human interaction as challenges, while Utonga et al. (2025) examined the factors shaping adoption of AI tools among Tanzanian students.

At the national level, the Education and Training Policy (URT, 2023) and the National ICT Policy (URT, 2016) promote the integration of ICT in teaching and learning, the National Digital Economy Framework (URT, 2025) envisions wide adoption of digital and AI-based tools, and the National Guidelines for Artificial Intelligence in Education encourage ethical AI use that supports rather than replaces teaching and learning (MoEST, 2025). The University of Dar es Salaam, the parent university of MUCE, issued guidelines in 2026 that permit ethical AI use in assignments but require students to declare AI use and to validate AI output (UDSM, 2026). However, a study of eight Tanzanian higher education institutions found that none had established its own AI policy (Matto & Ponera, 2025).

1.2 Statement of the Problem

Higher learning institutions are under pressure to improve academic productivity in a rapidly changing digital environment (UNESCO, 2023). GenAI tools support literature searching, academic writing and idea development and can personalise explanations of complex concepts (Kasneci et al., 2023; Mhlanga, 2023). However, unguided use can weaken the learning processes it is meant to support: academic use of GenAI has been associated with lower behavioural engagement and learning interest (Guo et al., 2025), students who practised with an unrestricted GPT-4 tutor performed 17% worse once it was removed (Bastani et al., 2025), and over-reliance on AI dialogue systems has been linked to weaker critical and analytical thinking (Zhai et al., 2024). In Tanzania, high use of ChatGPT has been accompanied by reduced academic integrity, weaker critical thinking and reduced human interaction (Mambile & Mwogosi, 2024; Matto, 2024; Stuart, 2024).

These studies have established that GenAI use is widespread among Tanzanian university students and that it can affect engagement, critical thinking and academic integrity. What they have not established is whether GenAI use changes the observable behaviours through which students engage with their university, namely attending lectures, participating in group learning and using the library. Existing Tanzanian studies concentrate on awareness, adoption, determinants of use and perceived benefits and risks (Mambile & Mwogosi, 2024;

Mollel, 2025; Utonga et al., 2025), while the available evidence on libraries concerns librarians' readiness to adopt AI rather than students' use of library resources (Ponera et al., 2026). Consequently, there is no empirical basis for deciding whether GenAI is replacing, complementing or having no effect on lectures, group work and library use in Tanzanian universities.

The University of Iringa (UoI) and Mkwawa University College of Education (MUCE) are suitable settings for investigating this problem. They represent a private and a public institution in the same municipality, GenAI use is already established among their students, and key informants reported that neither had a specific guideline on GenAI use in coursework or examinations at the time of the study, so any effect on attendance, group learning and library use occurs without institutional guidance. This study therefore examined how GenAI use affects students' class attendance, participation in group learning activities and use of library facilities at UoI and MUCE, in order to provide evidence on which institutional guidelines, teaching strategies and library services can be based.

1.3 Research Objectives

1.3.1 General objective

The general objective of the study was to examine the effects of Generative Artificial Intelligence on students' learning behaviour at the University of Iringa and Mkwawa University College of Education, Iringa, Tanzania.

1.3.2 Specific objectives

1. To examine the effects of GenAI on students' class attendance at UoI and MUCE.
2. To assess the effects of GenAI on students' participation in group learning activities at UoI and MUCE.
3. To find out the effects of GenAI on students' use of library facilities at UoI and MUCE.

1.4 Research Questions

1. What are the effects of GenAI on students' class attendance at UoI and MUCE?
2. What are the effects of GenAI on students' participation in group learning activities at UoI and MUCE?
3. What are the effects of GenAI on students' use of library facilities at UoI and MUCE?

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

The study was guided by the Technology Acceptance Model (TAM) of Davis (1989), which holds that perceived usefulness and perceived ease of use shape the intention to use a technology and, in turn, its actual use. Students who find GenAI useful for summarising notes and preparing assignments, and easy to access on a smartphone, are therefore expected to use it frequently. Following TAM's provision for external variables (Venkatesh & Davis, 2000), the study extended the model from adoption to the consequences of actual use for class attendance, group learning participation and library use. TAM was preferred because it is parsimonious and widely applied in education, including to ChatGPT (Granić & Marangunić, 2019; Strzelecki, 2024). Because TAM gives little attention to institutional factors, digital literacy, internet access, institutional policy and lecturers' teaching approaches were treated as moderating factors. No direction of effect was assumed: GenAI may replace lectures, group discussion and library searching, or it may help students prepare for them.

2.2 Empirical Literature Review

2.2.1 Effects of GenAI on class attendance

No study located for this review measured the effect of GenAI on class attendance directly. The closest evidence is the survey by Guo et al. (2025), which associated academic use of GenAI with lower behavioural engagement but higher cognitive engagement, and the experiment by Bastani et al. (2025), in which students relied on an unrestricted AI tutor as a crutch. Class attendance is one of the strongest predictors of academic performance (Credé et al., 2010), so any reduction linked to GenAI carries academic risk. Ibrahim et al. (2023), studying conversational AI across 32 university courses, showed that students can use such tools at every stage of coursework, including preparation before class, which suggests that GenAI may support attendance as well as replace it. Cotton et al. (2024) further cautioned that unsupervised AI use can weaken the academic value of attended coursework.

2.2.2 Effects of GenAI on participation in group learning activities

Evidence on group learning is equally indirect. Mambile and Mwogosi (2024) identified reduced human interaction as a challenge of AI in Tanzanian higher education, and Mollel (2025) found that peer influence predicted AI use, which indicates that GenAI use and group learning are socially linked. Sarakikya and Kitula (2024) found among students in Arusha that AI use improved individual academic engagement without a uniform improvement in

group collaboration, and Oravec (2023) called for responsible human-AI collaboration so that AI supports rather than replaces joint academic work.

2.2.3 Effects of GenAI on use of library facilities

Tanzanian evidence on libraries reflects mainly the supply side. Ponera et al. (2026) found that most of 13 academic libraries had not yet begun using AI in their services and that the absence of policies and training were major challenges, and Tweve (2026) argued for the ethical use of AI in Tanzanian academic libraries. GenAI systems can produce fluent but inaccurate text, including references to sources that do not exist (Kasneci et al., 2023; Zhai et al., 2024), which implies a continuing need to verify GenAI output against library sources. Zawacki-Richter et al. (2019) observed that AI tends to be accepted most readily for exploratory and preparatory tasks, while formal citation remains anchored in verifiable academic sources.

2.3 Knowledge Gap

The reviewed studies agree that GenAI use is widespread and that it carries both benefits and risks, but they give mixed results on how it affects engagement (Bastani et al., 2025; Guo et al., 2025; Matto, 2024). Three gaps follow from this review. Empirically, existing studies measure awareness, adoption, perceptions, performance or cognitive outcomes, but none located examined the effects of GenAI use on class attendance, group learning participation and library use together. Contextually, Tanzanian studies were conducted at other institutions, library studies involved librarians rather than students, and no study was found for Iringa Region or for a private and a public institution in the same municipality. Conceptually, most studies use acceptance models to explain the adoption of GenAI rather than treating actual GenAI use as a factor that may change students' learning behaviour.

This study addresses these gaps by measuring the three learning behaviours together, comparing a private and a public institution, and using the Technology Acceptance Model to link actual GenAI use to class attendance, group learning participation and library use, while allowing for positive, negative and mixed effects.

2.4 Conceptual Framework

In the conceptual framework, GenAI use (awareness, tools, purposes and frequency of use) is the independent variable, and students' learning behaviour is the dependent variable, measured through class attendance (Objective i), participation in group learning activities

(Objective ii) and use of library facilities (Objective iii). Digital literacy, internet access and devices, institutional policy and lecturers' teaching approaches are moderating factors that may strengthen, weaken or change the direction of the relationship. The framework does not assume a single direction of effect: attendance may fall if GenAI explanations substitute for lectures but rise if students use GenAI to prepare for class; group participation may fall if GenAI encourages independent task completion but improve if it helps students prepare their contributions; and library use may fall if GenAI replaces searching for sources but rise if the need to verify GenAI output leads students to consult library resources (Kasneci et al., 2023; Zhai et al., 2024).

3. MATERIALS AND METHODS

3.1 Study Area

The study was conducted at two higher learning institutions in Iringa Municipality, Iringa Region, Tanzania: the University of Iringa (UoI), a private university in Kihesa Ward, and Mkwawa University College of Education (MUCE), a public constituent college of the University of Dar es Salaam in Mkwawa Ward. The two institutions were selected because they represent different institutional types operating in the same municipality, which allowed comparison while holding the local context broadly constant; because no study of GenAI and learning behaviour had been located for Iringa Region; and because both have large student populations. Both offer diploma, undergraduate and postgraduate programmes and operate computer laboratories, internet connectivity and physical and digital library services. Key informants reported that neither institution had a specific guideline on GenAI use in coursework or examinations at the time of the study.

3.2 Research Approach

A mixed-methods approach was adopted. The quantitative strand measured patterns and associations between GenAI use and the three learning behaviours, while the qualitative strand provided explanations of students' experiences and institutional practices.

3.3 Research Design

A cross-sectional design was used, with data collected at a single point in time during the 2025/2026 academic year. The design allowed the study to capture existing patterns of class attendance, group learning participation and library use without a long follow-up period.

3.4 Study Population

The target population comprised students registered at UoI (3,749) and MUCE (6,272) in the 2025/2026 academic year, a combined total of 10,021, together with lecturers, librarians and deans of students. Students were eligible if they were registered at diploma, bachelor's or master's level, were aged 18 years or above and gave informed consent; prior use of GenAI was not a condition, so that both users and non-users could be captured. Key informants were eligible if they had at least two years of service at the institution.

3.5 Sample Size and Sampling Techniques

3.5.1 Sample size

The student sample was determined using Yamane's (1967) formula, $n = N / (1 + Ne^2)$, with $N = 10{,}021$ and $e = 0.09$, giving $n = 10{,}021 / 82.17 \approx 122$. A 9% margin of error was adopted as a compromise between precision and the time and resources available to a single researcher, and the smaller sample was complemented by qualitative data for triangulation. The achieved sample comprised 66 students from UoI and 56 from MUCE.

3.5.2 Sampling techniques

Stratified random sampling was used for the questionnaire. Students were stratified by institution and by level of study, and respondents were selected randomly from registered student lists obtained from each Registrar's Office, with allocation across levels proportional to enrolment. Purposive sampling was used to select ten key informants, namely two lecturers, two librarians and one administrative officer from each institution. Participants for the focus group discussions (FGDs) were selected purposively from questionnaire respondents who agreed to further contact, mixing male and female students, levels of study, and frequent and less frequent GenAI users.

3.6 Data Collection Methods

3.6.1 Structured questionnaire

A structured questionnaire with closed-ended items and open-ended follow-up items was administered in person on smartphones using KoboToolbox. It contained sections on respondent background, GenAI use (awareness, tools, frequency and purpose), class attendance, group learning participation and library use. Attendance was measured through reported change in lecture attendance, motivation to attend physically, use of GenAI to prepare for class and reasons for attending; group learning through regular participation, whether GenAI had shaped participation, use of GenAI to prepare for group tasks and five

Likert-scale statements; and library use through visit frequency, reduced dependence on library resources, continued use of books and journals, preferred information source, time spent in the library and verification of GenAI output.

3.6.2 Key informant interviews

Semi-structured interviews of 40 to 60 minutes were conducted face to face with the ten key informants in English or Kiswahili, using an 11-question guide organised by objective: four questions on class attendance, four on group learning participation and three on library use.

3.6.3 Focus group discussions

Two FGDs, one at each institution with six students each (12 participants in total), were facilitated using a 14-question guide covering the three objectives. Interviews and FGDs were audio-recorded with consent, transcribed verbatim and translated into English where necessary.

3.7 Data Analysis

Questionnaire data were exported from KoboToolbox to Microsoft Excel for cleaning and coding and analysed in SPSS Version 27 using frequencies, percentages, means and standard deviations. Chi-square tests of independence examined associations between frequency of GenAI use and the categorical indicators of each learning behaviour. Because 78.7% of respondents used GenAI daily and only three used it rarely, frequency of use was grouped into daily and less-than-daily use so that no more than 20% of cells had expected counts below five; Fisher's exact test was also reported for 2×2 tables with an expected count below five. Because several indicators were tested, results close to the 0.05 level were interpreted with caution. Qualitative data were analysed thematically (Braun & Clarke, 2006), with codes grouped into themes under the three objectives and used to explain and triangulate the quantitative results.

3.8 Validity and Reliability

Content validity was established through review of the instruments by academic supervisors and experts in education and AI. The questionnaire was pre-tested with students who were not part of the final sample, and Cronbach's alpha, with 0.70 as the threshold, was used to assess the internal consistency of the Likert-scale items (Tavakol & Dennick, 2011).

3.9 Ethical Considerations

Research clearance was obtained from the University of Iringa, and permission for data collection was granted by both institutions. Participation was voluntary, informed consent was obtained before any questions were displayed or interviews began, no personally identifiable information was collected, and participants are identified only by role and institution.

4. RESULTS AND DISCUSSION

4.1 Characteristics of Respondents and Patterns of GenAI Use

4.1.1 Demographic characteristics and patterns of GenAI use

Of the 122 respondents, 54.1% were from UoI and 45.9% from MUCE, 50.8% were male and 49.2% female, and 72.1% were bachelor's, 14.8% diploma and 13.1% master's students. Most were aged 22 to 29 years (75.4%). Almost all (98.3%) had reliable internet access for academic purposes, and 95.1% used a smartphone for learning, while 64.8% used a laptop. Table 1 shows that 96.7% of students were aware of GenAI tools and 78.7% used them daily. ChatGPT was the most widely used tool (94.0% of users), followed by Gemini (55.6%), and the leading purposes were summarising notes (87.7%), writing assignments (69.7%) and preparing for examinations (65.6%).

Table 1: Awareness and patterns of GenAI use among students. (n = 122)

Variable and category	Frequency (n)	Percent (%)
Aware of GenAI tools		
Yes	117	96.7
No	4	3.3
GenAI tools used (multiple responses; n = 117)		
ChatGPT	110	94.0
Gemini	65	55.6
Grammarly	34	29.1
Claude	18	15.4
Copilot	14	12.0
Frequency of use for academic purposes		
Daily	96	78.7
Occasionally	13	10.7
Weekly	10	8.2
Rarely	3	2.5
Main purpose of use (multiple responses)		

Variable and category	Frequency (n)	Percent (%)
Summarising notes	107	87.7
Assignment writing	85	69.7
Examination preparation	80	65.6
Research	40	32.8

Source: Field data (2026).

4.1.2 GenAI uptake and institutional preparedness

These levels of awareness and daily use are higher than those reported by Stuart (2024) and close to the 81.5% use recorded by Matto (2024), which suggests that GenAI adoption has continued to accelerate in Tanzanian higher education. In TAM terms, near-universal awareness combined with daily use indicates that students perceived GenAI as both useful and easy to use. Because the leading uses (summarising notes, writing assignments and preparing for examinations) are the tasks around which lectures, group work and library use have traditionally been organised, GenAI had entered the activities through which the three learning behaviours are expressed. Key informants confirmed that institutional responses lagged behind this uptake. A lecturer at MUCE explained: "We do not yet have a specific guideline on GenAI use in coursework or examinations; each lecturer is left to decide for themselves whether to allow it, restrict it, or ignore it." This is consistent with Matto and Ponera (2025), who found that no Tanzanian institution studied had its own AI policy.

4.2 Effects of GenAI on Students' Class Attendance

4.2.1 Change in lecture attendance and motivation to attend

Table 2 shows that 62.8% of students reported that GenAI use had reduced their lecture attendance, 25.6% reported increased attendance and 11.6% no change. A larger share (70.8%) agreed that GenAI sometimes reduced their motivation to attend classes physically, yet 89.0% reported that AI tools helped them prepare before attending class. Among the 85 students whose motivation had fallen, the leading reasons were that GenAI already provided learning materials and summaries (52.9%) and that concepts could be explained by GenAI without attending (24.7%). The most common reasons for continuing to attend were to understand the lecturer's explanations better (50.4%) and to participate in class discussions and group activities (38.0%).

Table 2: Effects of GenAI on lecture attendance and class preparation.

Indicator and response	Frequency (n)	Percent (%)
Change in lecture attendance associated with GenAI use (n = 121)		
Reduced attendance	76	62.8
Increased attendance	31	25.6
No change	14	11.6
GenAI sometimes reduces motivation to attend physically (n = 120)		
Yes	85	70.8
No	35	29.2
AI tools help students prepare before attending class (n = 118)		
Yes	105	89.0
No	13	11.0

Source: Field data (2026).

4.2.2 Selective attendance: evidence from interviews and focus groups

The qualitative evidence showed that the reduction was selective. A lecturer at UoI observed that some students "treat the lecture as optional", especially for units whose content is easy to summarise. FGD participants explained that they skipped theory-heavy units but attended practical, seminar and discussion-based sessions, as one UoI participant described: "For a unit like statistics where the lecturer solves problems on the board and answers our questions on the spot, I must be there, because ChatGPT can solve the problem but it cannot see where exactly I am confused." An administrator at MUCE similarly reported that attendance at tests, seminars and practicals had remained almost unchanged while ordinary lectures were less well attended. A MUCE FGD participant noted a hidden cost: skipped lectures meant missing announcements and informal guidance that were not captured in any AI-generated summary.

4.2.3 Chi-square test: frequency of GenAI use and change in lecture attendance

Table 3 presents the chi-square test of association between frequency of GenAI use and change in lecture attendance. The association was not significant ($\chi^2 = 4.424$, df = 2, p = 0.0469): reduced attendance was reported by 62.5% of daily users and 64.0% of less frequent users. Frequency of use was associated with reduced motivation to attend ($\chi^2 = 0.123$, df = 1, p = 0.0726) or with using GenAI to prepare for class ($\chi^2 = 3.611$, df = 1, p = 0.106). The attendance effect was therefore broad-based rather than confined to heavy users: once

students judged GenAI useful for a particular unit, even occasional use was enough to change their attendance decisions, which is consistent with TAM's emphasis on perceived usefulness rather than intensity of use.

Table 3: Cross-tabulation and chi-square test of frequency of GenAI use and change in lecture attendance.

Frequency of GenAI use	Increased	No change	Reduced	Total
Daily	24	12	60	96
Less than daily	7	2	16	25
Total	31	14	76	121

$\chi^2 = 0.424$, df = 2, p = 0.809; not significant at $\alpha = 0.05$.

Source: Field data (2026).

4.2.4 Discussion of attendance findings

These findings extend earlier observations that digital resources can substitute for physical attendance when equivalent content is available remotely, by showing that GenAI goes further because it generates explanations and summaries on demand. At the same time, the high proportion of students using GenAI to prepare for class is consistent with Ibrahim et al. (2023), who found that students used conversational AI across the whole academic workflow. Given that attendance strongly predicts performance (Credé et al., 2010), the selective decline in attendance is a concern, and it falls into a policy gap, since neither the national guidelines (MoEST, 2025) nor the UDSM (2026) guidelines set attendance expectations for the GenAI era.

4.3 Effects of GenAI on Students' Participation in Group Learning Activities

4.3.1 Participation patterns and effects of GenAI on group learning

Most students (84.4%) participated regularly in group discussions, mainly to share ideas and knowledge (61.2%) and to improve communication and teamwork skills (40.8%). GenAI had shaped group participation for 91.0% of students, 92.6% used it to prepare for group discussions, assignments or presentations, and 65.8% agreed that AI tools encouraged independent more than collaborative learning. Among the 111 students whose participation had been shaped, the effects were mainly facilitative: 64.0% said GenAI increased their participation by helping them understand topics beforehand, 41.4% said it helped them contribute more ideas and 26.1% said it improved their confidence. However, 32.4% reported that GenAI had reduced their participation because they could obtain information

independently. Table 4 shows that agreement was highest for statements on individual preparation and quality of contributions and lowest, with the widest spread of opinion, for the statement that GenAI reduces the need to interact with classmates.

Table 4: Level of agreement with statements on GenAI and group learning. (%)

Statement	SD	D	N	A	SA	Mean	Std. Dev.
GenAI improves the quality of contributions during group discussions	0.0	1.7	11.6	35.5	51.2	4.36	0.75
GenAI helps me understand topics before participating in group activities	0.0	0.0	4.9	54.9	40.2	4.35	0.57
GenAI has positively influenced group learning outcomes	2.5	11.5	11.5	45.9	28.7	3.87	1.03
GenAI enhances collaboration among students	4.9	13.9	7.4	45.1	28.7	3.79	1.15
GenAI reduces my need to interact with classmates for academic purposes	10.7	20.7	2.5	42.1	24.0	3.48	1.34

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree. Means on a scale of 1 to 5.

Source: Field data (2026).

4.3.2 Depth of collaboration: evidence from interviews and focus groups

Lecturers described two simultaneous effects. One lecturer at UoI explained that some students arrive better prepared and contribute confidently, while others "do almost everything alone using AI and then just bring a finished piece to the group". Another observed that groups submitted polished work on time, but some members could not defend points their group had made, indicating that "participation in the sense of shared understanding and joint reasoning has, in some groups, become weaker". FGD participants confirmed that AI-assisted tasks were sometimes divided and completed separately under tight deadlines, while one group had introduced its own safeguard by requiring each member to explain their AI-assisted section in their own words before submission.

4.3.3 Chi-square test: frequency of GenAI use and preparation for group learning

The chi-square test showed a significant association between frequency of GenAI use and use of GenAI to prepare for group learning activities ($\chi^2 = 11.764$, df = 1, N = 121, p = 0.001; Fisher's exact p = 0.003). Daily users were more likely to use GenAI for this purpose (92 of 95, 96.8%) than less frequent users (20 of 26, 76.9%). Whether GenAI had shaped participation followed the same direction (93.8% against 80.8%) but did not reach significance (Fisher's exact p = 0.055), and regular participation in group discussions was not

associated with frequency of use ($\chi^2 = 0.336$, df = 1, p = 0.562). Frequent GenAI use therefore changes how students prepare for group learning rather than whether they take part in it. In TAM terms, perceived usefulness appears to grow with familiarity, as daily users integrate GenAI more fully into collaborative routines.

4.3.4 Discussion of group learning findings

The dual facilitative and inhibitive effect mirrors Sarakikya and Kitula (2024), who found that AI use improved individual engagement without a uniform improvement in collaboration, and Nantale et al. (2025), whose participants used AI as an individual first source of information before engaging with peers. It also supports the concern of Mambile and Mwogosi (2024) about reduced human interaction and the call by Oravec (2023) for responsible human-AI collaboration. The distinction between visible participation (attending, contributing a section, submitting on time) and substantive participation (shared reasoning) explains how 91.0% of students could report that GenAI shaped their participation while lecturers observed weaker collaboration in some groups.

4.4 Effects of GenAI on Students' Use of Library Facilities

4.4.1 Library visits, dependence and continued use of library resources

Table 5 shows that most students visited the library only occasionally (59.8%) or rarely (21.3%), and 87.6% reported that GenAI had reduced their dependence on library resources, mainly because it provided information quickly (62.3%) and offered explanations and summaries that reduced the need to search library books (56.6%). Nevertheless, 75.0% still used books, journals and library databases alongside GenAI, mainly because academic sources are more reliable (48.3%) and because they needed scholarly references (48.3%), and 53.7% preferred to use both AI tools and library resources. Most students (92.5%) used GenAI to search for references before visiting the library, 82.5% reported spending less time in the library and 55.4% verified GenAI information using library resources, while 61.5% believed that GenAI could replace the role of the library.

Table 5: Library use and effects of GenAI on library dependence.

Indicator and response	Frequency (n)	Percent (%)
Frequency of library visits (n = 122)		
Frequently	22	18.0
Occasionally	73	59.8
Rarely	26	21.3

Indicator and response	Frequency (n)	Percent (%)
Never	1	0.8
GenAI has reduced dependence on library resources (n = 121): Yes	106	87.6
Still use books, journals and databases alongside GenAI (n = 116): Yes	87	75.0
Preferred source of academic information (n = 121)		
Both AI tools and library resources	65	53.7
AI tools	44	36.4
Library resources	12	9.9
GenAI reduced time spent in the library (n = 120)	99	82.5
Verify GenAI information using library resources (n = 121): Yes	67	55.4
GenAI can replace the role of the university library (n = 122)		
Yes	75	61.5
No	25	20.5
Not sure	22	18.0

Source: Field data (2026).

4.4.2 Changing library use: evidence from librarians and students

Librarians described a marked decline in physical use. A UoI librarian reported that weekly borrowing had fallen from up to 15 books per student before 2022 to about one book, and a MUCE librarian observed that students came mainly during examinations or when lecturers instructed them to. However, librarians also reported that students still came for dissertations and when lecturers required peer-reviewed sources, and that the library's role had shifted "from being the first place to search, to being the place where information gets checked and properly referenced". FGD participants described a two-step routine of using GenAI to identify themes and possible sources and then using library databases to locate, read and cite the real sources, partly because GenAI sometimes produced titles that did not exist.

4.4.3 Chi-square test: frequency of GenAI use and perceived replacement of the library

The chi-square test showed a significant association between frequency of GenAI use and the belief that GenAI can replace the library ($\chi^2 = 7.208$, df = 2, N = 122, p = 0.027). Two-thirds of daily users (64 of 96, 66.7%) held this belief compared with 42.3% of less frequent users (11 of 26), while less frequent users were more than twice as likely to reject it (38.5% against 15.6%). Frequency of use was not significantly associated with reduced dependence on the

library (Fisher's exact p = 0.521), verification of GenAI output ($\chi^2 = 2.574$, df = 1, p = 0.109) or frequency of library visits ($\chi^2 = 3.216$, df = 3, p = 0.360), and reduced dependence did not differ between UoI and MUCE (Fisher's exact p = 0.167). Frequent GenAI use therefore shapes how students value the library more than how often they use it.

4.4.4 Discussion of library use findings

The gap between the 61.5% who believed GenAI could replace the library and the 75.0% who still used library resources shows that stated attitudes were more permissive than actual behaviour. The pattern supports Zawacki-Richter et al. (2019), who observed that AI is accepted most readily for exploratory tasks while citation remains anchored in verifiable sources, and UNESCO's (2023) advice that AI should complement information literacy skills rather than replace them. It also reinforces the calls by Ponera et al. (2026) and Tweve (2026) for libraries to adapt their services. The 55.4% of students who verified GenAI output were already doing what the UDSM (2026) guidelines require, while the 44.6% who did not show where library-led information literacy training is most needed.

4.5 Limitations of the Study

The study was cross-sectional and based on self-reported behaviour, so it identifies associations and perceived effects rather than causal relationships, and it did not use objective records such as attendance registers or library logs. The 9% margin of error and the focus on two institutions in one municipality limit generalisation to other Tanzanian universities. Triangulation with key informant interviews and FGDs was used to reduce, but cannot remove, these limitations.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

GenAI has become embedded in the academic routines of students at UoI and MUCE and is reshaping, rather than simply displacing, their learning behaviour. It has reduced the perceived necessity of attending lectures for theory-heavy, easily summarised content while leaving the value of interactive, practical and discussion-based sessions largely intact, and this effect operates across all levels of use. In group learning, GenAI has a dual effect: it improves preparation, understanding and confidence, but it can weaken shared reasoning where students complete tasks alone and bring only finished outputs to the group. It has reduced, but not eliminated, the role of the library, which remains the trusted source for credible, citable evidence, while frequent users are the most likely to undervalue it. These

changes are taking place without institutional guidance, since neither institution had a GenAI guideline at the time of the study.

5.2 Recommendations

5.2.1 Recommendations for action

University management at both institutions should develop formally communicated guidelines on the responsible use of GenAI, covering attendance expectations, acceptable use in assignments and group work, and disclosure of AI assistance, in line with the national guidelines (MoEST, 2025) and, for MUCE, the UDSM (2026) guidelines. Lecturers should redesign teaching and assessment so that physical attendance adds value that GenAI cannot provide, and should assess the process of group work, including oral explanation of each member's contribution, rather than only the final product. Libraries should reposition their services to complement GenAI by teaching students to verify AI-generated information and to cite credible sources, with priority given to frequent users.

5.2.2 Recommendations for further research

Future research should use longitudinal and multi-institution designs, combine self-reports with objective institutional records, and examine further outcomes such as academic integrity, performance and critical thinking.

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