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The utilization of generative ai and its correlation on student engagement: Insights from a private Higher Education institution in Papua New Guinea

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Abstract

This study investigated the relationship between the utilization of Generative Artificial Intelligence (GenAI) tools and students' classroom engagement in a private higher education institution in Papua New Guinea (PNG). It examined how students perceived and used GenAI in their academic work and how such tools influenced their autonomy, competence, and relatedness in learning environments. A descriptive-correlational research design was employed, utilizing survey questionnaires administered to 320 students. The findings revealed that students extensively used GenAI tools and perceived them as highly useful and easy to use, with an overall weighted mean of 3.82. Likewise, student engagement in terms of autonomy and competence and relatedness was high, with a weighted mean of 3.57. Correlation analysis indicated a strong positive relationship between GenAI utilization and classroom engagement, suggesting that greater usefulness and ease of use of GenAI tools were associated with increased levels of motivation, independence, and confidence in learning tasks. The study concluded that responsible and strategic integration of GenAI enhanced learning experiences and academic outcomes. Moreover, it highlighted the importance of institutional policies and capacity-building initiatives to ensure ethical and equitable use of AI in education. The research further led to the development of a policy brief designed to guide higher education institutions and policymakers in implementing GenAI to foster student engagement and digital transformation within PNG's higher education sector.

Keywords: Autonomy, competence and relatedness, ease of use, generative AI, student engagement, usefulness

1. Introduction

Higher education has seen a revolution in the utilization of generative artificial intelligence (GenAI), which provides cutting-edge resources that improve instruction, learning, and student involvement. To enhance student-centered learning environments, automate feedback, and personalize instruction, educational institutions around the world are incorporating GenAI products like ChatGPT, DALL·E, and Bard (Zawacki-Richter et al., 2024; Yang & Li, 2023). The potential to transform educational experiences is growing along with AI's capabilities.
To create new content that replicates the style, structure, or logic of the original data, generative AI uses sophisticated algorithms and models to evaluate big datasets (Bandi et al., 2023; Banh & Strobel, 2023; Batchu & Satya, 2024; Cui et al., 2024; Lv, 2023; Warankar, 2024). It creates original outputs like computer code, paintings, stories, and music by identifying patterns in data (Bandi et al., 2023; Banh & Strobel, 2023; Batchu & Satya, 2024; Warankar, 2024). Articles, stories, conversations, realistic images, concept art, visual designs, music, voice, and video content are just a few of the many types of content that generative AI can produce (Batchu & Satya, 2024; Epstein et al., 2023; Lv, 2023; Sengar et al., 2024; Warankar, 2024; Ye et al., 2024; P. Zhang & Boulos, 2023).

Intrinsic drive, preparedness to accept AI, self-confidence, and fear about its application all affect how engaged students are with generative AI technologies. Favorable opinions of AI-based learning environments are then fostered by positive encounters with user interfaces, content quality, and interactive features, which further improve perceived usefulness and ease of use (W. Li et al., 2024). GenAI encourages the creation of original ideas and facilitates self-paced, independent learning. When using these tools, students report enhanced study efficiency and gains in their language and writing skills (Fawaz et al., 2025). By improving student involvement, focus, and self-reflection, generative AI systems have the potential to completely transform teaching and learning in educational environments (Kong & Yang, 2024). Furthermore, by promoting concept analysis and opinion sharing, conversational agents driven by generative AI greatly increase students' cognitive engagement in online collaborative writing exercises (Hu et al., 2024).

Students can benefit from GenAI in a number of ways. It makes individualized learning experiences possible, letting students focus on areas of interest or need and advance at their own pace (Fawaz et al., 2025). When employing AI-driven instructional tools, students report gains in their language, writing, and critical thinking abilities (Fawaz et al., 2025; Khoo & Kang, 2022). However, over-reliance on AI, possible errors, and unequal access to technology are issues. Institutional policies and proper use are also unclear (Fawaz et al., 2025; Kazley et al., 2024). Students are also aware of how GenAI could jeopardize academic integrity, particularly in tasks that are scored. Nonetheless, a lot of people believe that AI can be used for learning and studying outside of official tests (Kazley et al., 2024). Although generative AI in education improves student interaction and allows for tailored learning, it also raises ethical, data privacy, and assessment integrity concerns (Shanto et al., 2024).

To maintain academic standards and assist students in understanding the appropriate applications of GenAI, teacher direction and clear policies are crucial (Kazley et al., 2024). Both faculty and students stand to gain from the successful integration of generative AI into university teaching and learning when a well-rounded strategy with adaptable rules is used (Cacho, 2024). It has been demonstrated that incorporating generative AI into a master 's-level instructional design course improves students' familiarity with the technology and broadens

their comprehension of its moral implications. It also highlights the real-world difficulties associated with its responsible application in learning environments (Wood & Moss, 2024). These programs encourage the establishment of fruitful learning habits and the responsible application of generative AI for knowledge acquisition.

Additionally, learner-centered, AI-driven strategies can empower students from a variety of backgrounds by fostering language development and improving academic performance. These tactics encourage fair participation among students and close gaps in academic preparedness (Fawaz et al., 2025; Khoo & Kang, 2022).

Education is starting to change as a result of the quick development of generative artificial intelligence (AI), especially huge language models like ChatGPT and other AI-powered applications. Because they provide individualized learning experiences, automate content creation, and accommodate a range of learner needs, these technologies are being incorporated into academic environments more and more. Because student engagement is crucial for academic achievement and retention, educators and academics are closely analyzing how GenAI impacts several facets of the learning process (Popenici & Kerr, 2017).

A key factor in determining significant educational outcomes is student engagement, which includes behavioral, emotional, and cognitive involvement in the learning process. By providing students with chances for creativity and expression, real-time feedback, and interactive and adaptive learning materials, the use of generative AI tools can improve engagement. AI-generated content, for instance, can be customized to students' interests and skill levels, creating more engaging and individualized learning environments (Bond et al., 2021). Furthermore, by offering on-demand academic support, chatbots and AI-powered virtual tutors have demonstrated promise in raising student motivation and engagement (Holmes et al., 2019).

Nonetheless, there are certain difficulties in the connection between generative AI and student involvement. It is necessary to address issues with academic integrity, excessive dependence on AI tools, and the possible decline in critical thinking abilities. Additionally, differences in access to AI technologies may exacerbate already-existing gaps in schooling (Cardona et al., 2023). A fair and moral integration of AI that encourages active participation rather than passive consumption is crucial as institutions embrace new capabilities. Leveraging the advantages of GenAI while reducing its drawbacks in educational settings requires constant research and discussion among educators, engineers, and students.

Student engagement is "the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities. (Kuh, 2009, as cited in Groccia, 2018). The psychological view on student engagement is very common in educational settings; according to Zhoc et al. (2019), this approach uses an individual's behavior and internal states, such as affect and cognition, to understand student involvement. "The manifestation of students' motivation" is how Schunk and Mullen (2012, as stated in Lan & Hew, 2020) identified engagement. These concepts demonstrate a connection between student motivation and involvement.

Learning motivation "is an inner process, action, or will which drive individuals toward behaviors which satisfy their needs," according to Lipičnik (1998, as cited in Lesjak et al., 2015). Students must actively engage in their educational experiences for education to be genuinely successful. This kind of involvement has a big impact on promoting academic pursuits. A sense of belonging to a learning community, active classroom involvement, and

contributions to curriculum design are characteristics of student participation, according to Bergmark and Westman (2018).

Student engagement is strongly correlated with positive learning outcomes. Improving students' learning processes and results largely depends on understanding and managing their engagement, particularly in higher education (Australian Council for Educational Research, n.d.). Cavanagh (2011) found that students who actively participated in lectures were more focused and attentive during sessions, motivated to review the slides and complete assigned readings, and continued reflective thinking on the topics between classes. According to a study by Zepke et al. (2014) that involved instructors and students in New Zealand, educators must actively promote student participation rather than just expecting it. Academic satisfaction and student involvement were shown to be strongly correlated in Chau and Cheung's (2018) study on academic satisfaction with hospitality and tourism education in Macao. According to Wu and Teets (2021), there was a decrease in student involvement after the coronavirus epidemic. According to their quantitative findings, the pandemic made it harder for students to focus on their schoolwork, and negative home conditions also contributed to a decrease in motivation and self-control.

The 2021 NSSE results show a discernible drop in some forms of student participation when compared to pre-pandemic levels (Weissman, 2022). This decrease was more noticeable in first-year students than in seniors, and it was especially noticeable in engagement activities like student-faculty engagement and collaborative learning that usually require in-person connection.

According to Tinto (quoted in Spitzig & Renner, 2022), students who are socially and academically integrated into the school have a higher chance of sticking around. In the end, increasing student involvement in the classroom requires the provision of stimulating activities.

According to M.-T. Wang et al. (2011, quoted in M. Wang & Degol, 2014), academic achievement is strongly predicted by student engagement. Better grades and stronger desires for higher education are linked to higher levels of behavioral and cognitive engagement. Making lessons interesting to students is one of the most important components of effective learning, and relevance is essential for encouraging student participation (Cambridge University Press & Assessment, 2022). When students are invested, engaged, and feel a connection to the learning process—both to the course material and to the others involved, including peers, teachers, and teaching assistants—they are exhibiting genuine engagement. Exposure to content is only one aspect of engagement (University of Waterloo, n.d.).

The learning process depends on involvement and motivation. Students' dedication to succeeding and active participation in their education have a big impact on their capacity to learn academic content as well as develop critical life skills. These attributes enable individuals to negotiate a world full of opportunities and challenges and lead satisfying lives (OECD, n.d.). In higher education, the utilization of GenAI offers revolutionary possibilities to improve the educational process and encourage student participation. GenAI tools—such as chatbots, content generators, and personalized learning assistants—offer dynamic ways to distribute instructional content and support academic work as higher education institutions adjust to changing technology landscapes. By streamlining administrative procedures, producing personalized feedback, simulating real-world situations, and accommodating a variety of learning styles, these technologies can make learning more engaging and accessible. This

change enhances the learning process by enabling teachers to concentrate on higher-order teaching activities in addition to enhancing conventional teaching techniques.

The potential of GenAI to support active, independent, and meaningful learning is what links it to student engagement. When provided with tools that enable them to explore, question, and create, along with immediate, adaptive feedback, students are more likely to participate. For example, in hybrid or online environments, AI-generated tests, customized study guides, and collaborative writing platforms can maintain interest and motivation. Furthermore, GenAI gives students a sense of agency and relevance by promoting inquiry-based learning and mimicking human-like conversation. Because it meets students' expectations for interactivity and technological relevance in their education, its incorporation into tertiary education not only improves academic assistance but also fosters deeper participation.

However, there is still a shortage of empirical research and discussion regarding the use of GenAI in developing nations, especially in places like Papua New Guinea (PNG), where student needs, pedagogical approaches, and digital infrastructure differ greatly from those in more developed nations. Accordingly, knowing how GenAI impacts student involvement in a private university in PNG provides important information about the regional advantages and difficulties of integrating AI. Thus, by investigating how GenAI affects learning outcomes, student engagement, and overall educational experiences in a private university in PNG, this study seeks to close this gap. Gaining an understanding of these dynamics is essential to creating contextually appropriate tactics that capitalize on GenAI's advantages while tackling the particular difficulties that have been experienced by the PNG's educational sector.

1.1 Background of study

The higher education system in PNG is distinguished by a combination of established digital efforts, conventional learning approaches, and structural constraints. With more than 800 languages and a wide range of sociocultural backgrounds, PNG's educational system has particular difficulties, such as poor funding, a high teacher-to-student ratio, and restricted internet access (Department of Education, 2023). These limitations present challenges for implementing new technologies, but they also point to chances for innovation-based leapfrogging. The strategic significance of AI in national development, including education, has been highlighted in recent national dialogues, such as the 2025 AI Summit in Port Moresby. This suggests that stakeholders are becoming more interested in using GenAI to improve student performance (Post Courier, 2025). The summit emphasized the necessity of contextual measures that promote digital fairness and educational inclusion while ethically integrating AI.

The emergence of GenAI and its implications for postsecondary education are addressed by higher education institutions. The EAO Social Communication School of Formation hosted an online session on Artificial Intelligence: Challenge of our Time, in which Don Bosco Technological Institute, Boroko, took part. The session covered the concept of AI, how to use it, and how it can be used pedagogically (Salesians Institutions of Higher Education, 2023). In order to regulate the use of artificial intelligence in evaluations, IBS University in Port Moresby adopted a policy that will use similarity detection software as one of the indicators of AI usage (IBSUniversity, 2023).

In addition, the Department of Mathematics & Computing Science at Divine Word University is actively using state-of-the-art AI technology to ensure that the learning process does not compromise human intellect (Nabilah, 2023). These demonstrate how higher

education institutions are making every effort to guarantee that generative AI can assist students in their learning process.

GenAI is also covered by PNG's Higher Education Department. To address important digitalization issues, DHERST published a Policy on Digitalization of Papua New Guinea Universities and Research Institutes in 2025. DHERST is focused on creating academic policies, promoting ethical AI usage, assisting academic institutions in adopting AI, monitoring and reducing the risks associated with AI use, and raising awareness to ensure responsible use of AI (Policies - Policy on Digitalization of Papua New Guinea Universities and Research Institutes - DHERST, 2025).

In the age of digital technology, using AI in higher and technical education has advanced in developed countries, but it will take some time for developing countries like PNG to catch up (DHERST, 2021). According to Polye (2024), the then-Minister of Higher Education, Research, Science, Technology, and Sport intended to use workshops to discuss AI and Digital Ethics to examine the moral environment in the era of intelligent machines. While acknowledging the difficulties, DHERST's readiness and guidance offer a beacon for investigating GenAI to guarantee responsible and moral use.

1.2 Objectives of the study

This study aimed to examine the relationship between the extent of the utilization of GenAI and students' classroom engagement in a private higher education institution in Port Moresby, Papua New Guinea.

Specifically, this study answered the following questions:

1. What was the extent of the students' awareness, access, and actual utilization patterns of GenAI tools for their academic works in terms of:
   a. Usefulness; and
   b. Ease of use?

2. What was the extent of the students' engagement in the classroom in terms of:
   a. Autonomy, and
   b. Competence and relatedness?

3. Was there a significant relationship that existed between the extent of the utilization of GenAI and students' classroom engagement?

4. What policy brief can be drawn from the findings of the study?

1.3 Hypothesis of the Study

The hypothesis of the study was tested at a 0.05 level of significance.

H_o: There was no significant relationship that existed between the extent of the utilization of GenAI and students' classroom engagement.

2. Theoretical framework

Technology acceptance model

A fundamental framework for comprehending how people embrace and engage with cutting-edge technology, such as GenAI, is the Technology Acceptance Model (TAM). According to TAM, which was first created by Davis in 1989, consumers' behavioral intention (BI) to adopt technology is primarily driven by two crucial factors: perceived usefulness (PU) and perceived ease of use (PEOU). TAM is still a useful theoretical framework for examining user acceptability of these intelligent systems as GenAI tools become more widely used in software development, education, content production, and customer support. According to recent research, consumers' propensity to embrace GenAI is significantly influenced by their opinions of its value, including its capacity to produce language that is human-like, automate difficult jobs, and assist in decision-making (Dwivedi et al., 2023).

Furthermore, the standard TAM frameworks take on new dynamics as a result of GenAI's quick development. In AI situations, for example, explainability, trust, and perceived originality are becoming more and more important mediators of PU and PEOU (Gursoy et al., 2019). Because GenAI systems are frequently considered as "black boxes," users' perceptions of the system's usability and trust may be impacted by ethical usage, bias, and disinformation. Consequently, TAM is being expanded to incorporate factors such as perceived transparency, user control, and confidence in AI, particularly when consumers engage with GenAI without fully comprehending how it produces information (Marikyan et al., 2023). According to Kasneci et al. (2023), students' acceptance of GenAI tools such as ChatGPT in educational contexts is mostly influenced by their conviction that the tool may improve learning and academic output, so long as it is clear, easy to use, and morally sound.

The model's ongoing significance is thus shown by the application of TAM to GenAI situations, which also emphasizes the necessity of its growth. As institutions and companies use GenAI for a variety of jobs, knowing the perceived advantages and challenges through TAM aids in creating systems that meet user expectations while being both efficient and morally sound. In a digital environment that is becoming more and more AI-driven, the model provides a strong, flexible foundation for anticipating and improving user engagement with GenAI technologies.

Self-Determination theory

Ryan and Deci (2017) stated that self-determination theory looks at how biological, social, and cultural factors either support or undermine the innate human potential for psychological development, participation, and well-being in a variety of contexts and endeavors. There were six mini-theories of the Self-Determination theory. These are:

1. Cognitive evaluation theory (CET) is primarily concerned with how events in the social environment impact intrinsic motivation.
2. Organismic Integration Theory (OIT), which the concepts of internalization and integration are essential, and which results in four major types of motivational regulation – external, introjected, identified, and integrated, with various types depending on the degree of autonomy, as well as in their unique causes and consequences on behavior and experience.

3. Causality Orientation Theory, which focuses on individual motivational differences.
4. Basic Psychological Needs Theory, which focuses on how satisfaction of basic psychological needs and frustration of those needs relate to well-being and illness.
5. Goal Contents Theory, which asserts, in keeping with eudaimonic theory (emphasizing the value of personal development, self-realization, and meaning in life), that putting more emphasis on intrinsic goals is associated with higher well-being and that a relatively strong focus on extrinsic goals is associated with lower well-being.
6. Relationships Motivation Theory, which suggests that people are naturally drawn to close relationships because of an innate relatedness urge.

Self-determination theory (SDT) explains student engagement by focusing on the satisfaction of three basic psychological needs: autonomy, competence, and relatedness. In the age of generative AI, SDT provides a useful framework for understanding how AI tools can enhance or hinder student engagement by supporting these needs. Generative AI can boost student engagement when it helps students feel more autonomous, competent, and connected in their learning.

According to SDT, all people have three fundamental psychological needs that must be met for them to function well and be healthy: relatedness, competence, and autonomy. When these fundamental requirements are met, the best motivational characteristics and states of intrinsic aspirations and autonomous motivation are fostered, which support mental well-being and productive interaction with the outside environment (Deci & Ryan, 2015). For Autonomy, GenAI tools provide students with choices and control over their learning, allowing them to explore topics, generate ideas, and solve problems in ways that suit their interests and learning styles. This sense of autonomy increases intrinsic motivation and engagement (T. Chiu, 2024; T. K. F. Chiu, 2024; Xia et al., 2022). With regards to Competence, by offering instant feedback, personalized support, and resources tailored to individual needs, GenAI helps students feel more capable and confident in their abilities. This boosts self-efficacy and encourages active participation (T. Chiu, 2024; T. K. F. Chiu, 2024; Gao et al., 2024; Kong & Yang, 2024; Liang et al., 2023; Shahzad et al., 2024). On Relatedness, GenAI can facilitate collaboration and communication among students from diverse backgrounds, fostering a sense of belonging and relevance in interdisciplinary and group projects (T. Chiu, 2021b, 2024; Xia et al., 2022).

GenAI tools promote higher-order thinking, creativity, and problem-solving by enabling students to access information, generate new ideas, and connect concepts across disciplines (T. Chiu, 2024; T. K. F. Chiu, 2024; Kong & Yang, 2024). Interaction with GenAI increases students' belief in their ability to succeed, which mediates the positive relationship between GenAI use and learning achievement (Gao et al., 2024; Liang et al., 2023; Shahzad et al., 2024). SDT-based approaches using GenAI show that needs satisfaction can engage students regardless of gender or achievement level, making AI learning more inclusive (Xia et al., 2022). Self-Determination Theory provides a clear framework for understanding how generative AI tools can enhance student engagement. By supporting autonomy, competence, and relatedness, GenAI fosters motivation, self-efficacy, and active participation, making learning more effective and inclusive.

3. Research methodology

This study explored the realizations of students regarding the implementation of GenAI and its role in their engagement in the learning process.

The descriptive-correlation research method was used in this study because it attempted to present the relationship between the implementation of the GenAI tools and the evaluation of the students' classroom engagement. According to Pandey and Pandey (2015), this type of method is a study in which the researcher is primarily interested in describing relationships among variables, without seeking to establish a causal connection.

The researchers used descriptive research to determine the extent of utilization of the GenAI and the level of students' classroom engagement through a survey questionnaire. In acquiring qualitative data, a descriptive study, also known as an exploratory study, and a qualitative description approach were utilized to describe phenomena rather than explain them (Doyle et al., 2020). Using this approach, the researchers were able to remain close to the data and the events being described. This study used this approach to determine how students use the GenAI tools for their academic work and their realizations in implementing them.

The study was conducted in IBSUniversity, Port Moresby, Papua New Guinea, during the academic year 2025.

The convenience sampling method was utilized in determining the sample population of the student-respondents. Creswell and Creswell (2018) explained that in convenience sampling, participants were chosen based on ease of access, time, location, or willingness, which helps expedite the data collection process but may limit the representativeness of the sample. The sample population of this study was composed of 320 enrolled students.

Ethical approval for the study was obtained from the IBSUniversity Research Ethics Committee. Before data collection, all potential participants were provided with detailed information about the study's purpose, their rights, confidentiality measures, and voluntary participation. Informed consent was obtained from all participants before they completed the survey or participated in focus groups.

The data for the study were collected using a questionnaire-based method. The researchers developed a structured set of questions specifically designed for the respondents based on the studies conducted by Freeman (2025) and Kember & Leung (2009). To carry out the data collection, several steps were followed. First, a formal letter was sent to the Pro-Vice Chancellor, Research Director, and the Head of Schools to seek approval for conducting the study.

After obtaining the approval, the researchers personally distributed the questionnaires to the designated respondents. After the respondents completed the questionnaires, the researchers carefully checked them to ensure that all questions were properly answered. Lastly, the encoded data were thoroughly cross-checked to verify their accuracy and ensure the validity of the responses.

To aid in the analysis and interpretation of the results, various statistical tools and techniques were employed.

The extent of the utilization of GenAI was quantified using the following scales:

Rating Scale	**Range**	**Analytical Description**	**Descriptive Interpretation**
5	4.20-5.00	The utilization is very extensive and is functioning excellently.	Very Great Extent
4	3.40-4.19	The utilization is extensive and is functioning very well.	Great Extent

3	2.60-3.39	The utilization is adequate and functioning well.	Moderate Extent
2	1.80-2.59	The utilization is limited and functioning poorly.	Limited Extent
1	1.00-1.79	The utilization is very limited and is functioning very poorly.	Very Limited Extent

The extent of the level of students' classroom engagement was quantified using the following scales:

Rating Scale	**Range**	**Analytical Description**	**Descriptive Interpretation**
5	4.20-5.00	Consistently demonstrates active participation, enthusiasm, initiative, and collaboration in the classroom activities.	Very Highly Engaged
4	3.40-4.19	Frequently participates, shows interest, and contributes to classroom discussions, and tasks.	Highly Engaged
3	2.60-3.39	Occasionally engages in activities and discussions, but lacks consistency or depth of involvement.	Moderately Engaged
2	1.80-2.59	Rarely participates or shows minimal interest in classroom tasks; mostly passive during sessions.	Slightly Engaged
1	1.00-1.79	Shows no interest or participation; disengaged from class activities and discussions.	Not Engaged

Standard deviation and weighted mean were used to determine the extent of the utilization of GenAI and the level of students' classroom engagement.

Correlation was used to determine whether the extent of GenAI utilization correlates with the level of students' classroom engagement.

The researchers obtained official approval from the relevant authority official approval. The responses of the respondents were anonymized in order to preserve their privacy. Each respondent received a written informed consent form detailing the possible advantages, risks, and procedures of the study. The consent form's clarity and comprehensibility were guaranteed by the researchers. The purpose of these actions was to protect each respondent's rights, needs, and welfare.

Data privacy and confidentiality were given top priority by the researchers before they examined any documents. Clear explanations of the study's objectives, the steps involved, and any possible advantages of participating were given to the respondents.

Moreover, the respondents were also made aware of their freedom to participate at their discretion, to withdraw at any moment, and to withdraw their consent at any time without repercussions.

4. Findings

Based on the gathered data, the following are the findings of the study:

Table 1. Extent of the Students' Awareness, Access, and Actual Utilization Patterns of GenAI Tools

Indicator	N	5	4	3	2	1	WM	SD	Description
A. Usefulness									
1. GenAI tools enhance my learning effectiveness in my courses.	320	91	113	93	13	10	**3.82**	**0.99**	**Great Extent**
2. GenAI tools help me complete my academic tasks more efficiently.	320	94	100	94	26	6	**3.78**	**1.02**	**Great Extent**
3. I believe GenAI tools improve the quality of my assignments and projects.	320	85	107	86	32	10	**3.70**	**1.06**	**Great Extent**
4. GenAI tools help me better understand complex course material.	320	136	94	61	16	13	**4.01**	**1.09**	**Great Extent**
5. I find GenAI tools to be useful for my academic success.	320	103	112	69	23	13	**3.84**	**1.08**	**Great Extent**
Weighted Mean							**3.83**	**1.05**	**Great Extent**
B. Ease of Use									
1. I find GenAI tools easy to learn and use.	320	122	92	76	19	11	**3.92**	**1.08**	**Great Extent**
2. My interactions with GenAI tools are clear and understandable.	320	94	114	79	26	7	**3.82**	**1.02**	**Great Extent**
3. It is easy for me to become skilled at using GenAI tools.	320	73	109	97	29	12	**3.63**	**1.05**	**Great Extent**
4. I find GenAI tools to be flexible and adaptable to my learning needs.	320	99	118	73	23	7	**3.87**	**1.00**	**Great Extent**
5. I feel comfortable using GenAI tools without much technical assistance.	320	100	105	81	28	6	**3.83**	**1.03**	**Great Extent**
Weighted Mean							**3.81**	**1.03**	**Great Extent**
Overall Weighted Mean							**3.82**	**1.04**	**Great Extent**

Figure 1. Weighted Means of Students' Awareness, Access, and Actual Utilization Patterns of GenAI Tools in Terms of Usefulness

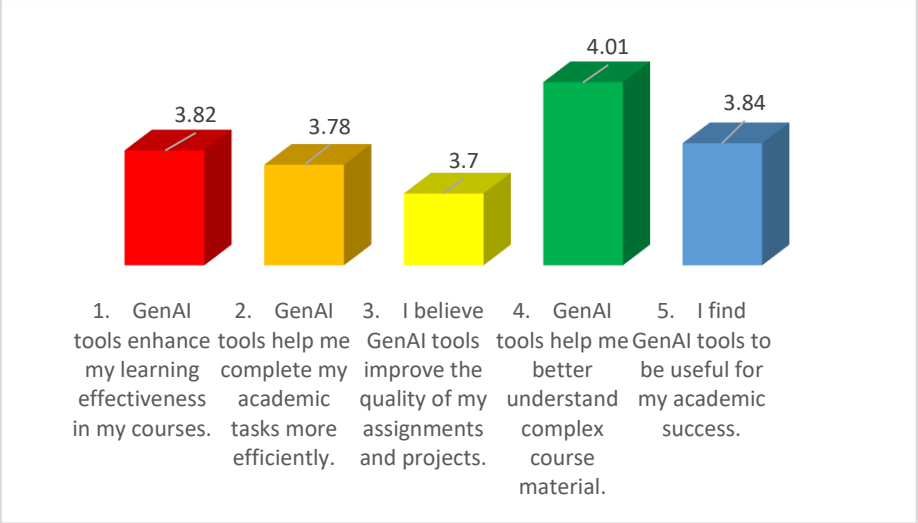

Figure 2. Weighted Means of Students' Awareness, Access, and Actual Utilization Patterns of GenAI Tools in Terms of Ease of Use

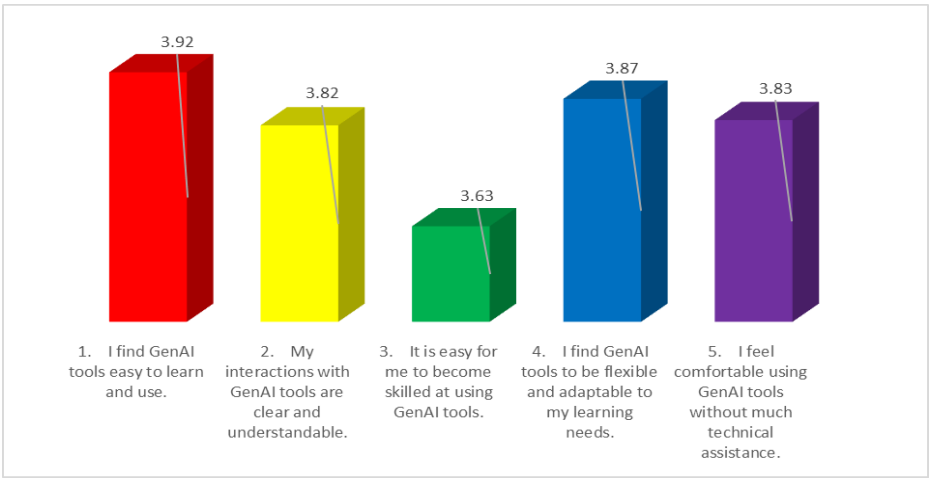

Table 1, Figure 1, and Figure 2 present the extent to which students are aware of, have access to, and actually use GenAI tools in terms of usefulness and each of their uses.

Under *Usefulness,* the weighted mean of 3.83 indicates that GenAI technologies are highly valuable to students' academic success. The statement "*GenAI tools help me better understand complex course material*" received the highest grade (WM = 4.01), indicating that these tools play an important role in clarifying difficult topics. Other factors, such as increasing learning effectiveness, improving assignment quality, and contributing to academic success, have mean values ranging from 3.70 to 3.84, all are categorized within the "*Great Extent*" category. This demonstrates a constant student appreciation for the practical and academic relevance of GenAI technology.

Similarly, under *Ease of Use*, students found GenAI technologies relatively easy to learn and implement, as seen by the weighted mean of 3.81. The item "*I find GenAI tools easy to learn and use*" has the highest mean (3.92), indicating that most students find GenAI tools easy to learn and use. Other features, such as system flexibility, clarity of interaction, and self-reliance in tool use, are also included in the "*Great Extent*" interpretation, indicating that students are comfortable incorporating GenAI technologies into their learning activities.

The results suggest that students typically assess GenAI tools positively, with an overall weighted mean of 3.82, which corresponds to the descriptive interpretation of "*Great Extent*." It indicates that the utilization is extensive and is functioning very well. Consequently, the findings suggest that students extensively utilize GenAI tools, underscoring their perceived usefulness, efficiency, user-friendliness, and widespread acceptance within the academic context.

Table 2. Extent of the Students' Engagement in the Classroom in Terms of Autonomy and Competence and Relatedness

Indicator	N	5	4	3	2	1	WM	SD	Description
A. Autonomy									
1. GenAI tools allow me to choose how I approach my learning tasks.	320	58	100	117	35	10	**3.50**	**1.01**	**Highly Engaged**
2. Using GenAI tools gives me a sense of control over my learning process.	320	49	106	104	49	12	**3.41**	**1.04**	**Highly Engaged**
3. I feel more independent in my studies when I use GenAI tools.	320	75	96	94	33	22	**3.53**	**1.16**	**Highly Engaged**
4. GenAI tools empower me to explore topics and generate ideas on my own.	320	102	98	79	28	13	**3.78**	**1.11**	**Highly Engaged**
5. Using GenAI tools aligns with my personal learning goals.	320	71	98	97	41	13	**3.54**	**1.09**	**Highly Engaged**
Weighted Mean							**3.55**	**1.08**	**Highly Engaged**
B. Competence and Relatedness									
1. Using GenAI tools helps me feel more capable and confident in my academic abilities.	320	54	102	114	29	21	**3.43**	**1.08**	**Highly Engaged**
2. I receive helpful and timely feedback from GenAI tools that improves my understanding.	320	93	111	71	37	8	**3.76**	**1.07**	**Highly Engaged**
3. GenAI tools help me feel more connected to the course material.	320	79	103	99	33	6	**3.68**	**1.02**	**Highly Engaged**
4. Using GenAI tools encourages me to actively participate in	320	53	92	115	37	23	**3.36**	**1.11**	**Moderately Engaged**

classroom discussions or activities.									
5. GenAI tools support my overall engagement with my studies.	320	93	106	86	20	15	**3.76**	**1.08**	**Highly Engaged**
Weighted Mean							**3.60**	**1.07**	**Highly Engaged**
Overall Weighted Mean							**3.57**	**1.08**	**Highly Engaged**

Figure 3. Weighted Means of the Students' Engagement in the Classroom in Terms of Autonomy

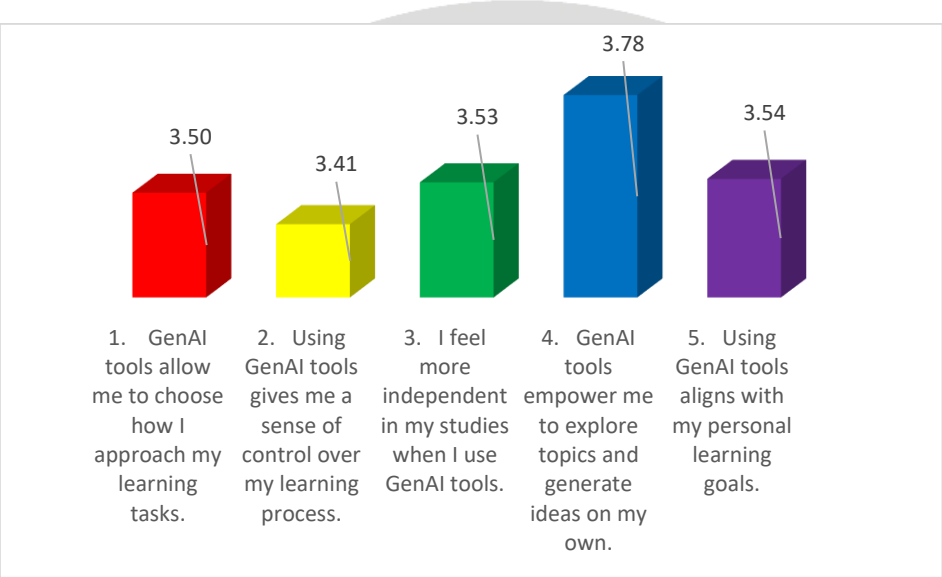

Figure 4. Weighted Means of the Students' Engagement in the Classroom in Terms of Competence and Relatedness

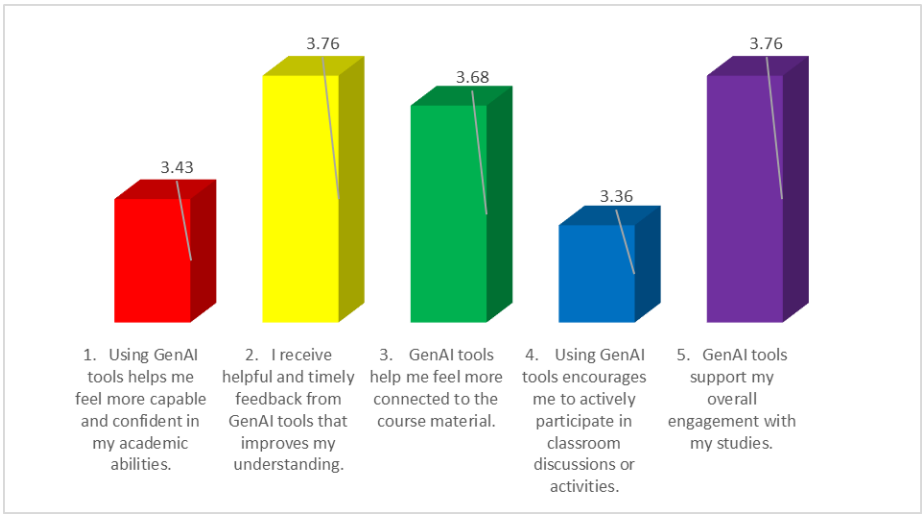

Table 2, Figure 3, and Figure 4 depict the extent of the students' engagement in the classroom in terms of Autonomy and competence and relatedness.

In terms of *Autonomy,* the computed weighted mean of 3.55 (SD = 1.08) indicates that students are actively engaged in self-directed learning. The findings show that students feel empowered

to choose their learning ways (WM = 3.50), have a sense of control over their learning (WM = 3.41), and develop independence through the usage of GenAI technologies (WM = 3.53). Furthermore, they can research topics on their own (WM = 3.78) and match their learning experiences with personal goals (WM = 3.54). These findings suggest that GenAI tools promote learner autonomy by allowing for flexibility, self-regulation, and goal-directed engagement.

For *Competence and Relatedness*, the weighted mean of 3.60 (SD = 1.07) also indicates a high level of engagement. Students report that GenAI tools enhance their confidence and academic capability (WM = 3.43) and provide timely feedback that improves understanding (WM = 3.76). They also feel more connected to the course material (WM = 3.68) and perceive GenAI as supportive of their overall learning engagement (WM = 3.76). However, the item on participation in class discussions (WM = 3.36) receives a moderately engaged interpretation, suggesting that while GenAI tools foster competence, they may not always translate to increased social or collaborative interaction.

The results indicate that students are *Highly Engaged* in the classroom when using GenAI tools, as reflected by the overall weighted mean of 3.57 (SD = 1.08). This level of engagement suggests that students frequently participate, show interest, and contribute meaningfully to classroom tasks and discussions

Table 3. Correlation between the Extent of the Utilization of GenAI and Students' Classroom Engagement.

Correlations

		Usefulness	Ease of Use	Autonomy	Competence & Relatedness
Usefulness	Pearson Correlation	1	.755**	.726**	.744**
	Sig. (2-tailed)		.000	.000	.000
	N	320	320	320	320
Ease of Use	Pearson Correlation	.755**	1	.716**	.715**
	Sig. (2-tailed)	.000		.000	.000
	N	320	320	320	320
Autonomy	Pearson Correlation	.726**	.716**	1	.827**
	Sig. (2-tailed)	.000	.000		.000
	N	320	320	320	320
Competence & Relatedness	Pearson Correlation	.744**	.715**	.827**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	320	320	320	320

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation table reveals that there is a significant positive relationship between the extent of GenAI utilization (in terms of *usefulness* and *ease of use*) and students' classroom engagement (in terms of *autonomy* and *competence & relatedness*). All correlation coefficients are significant at the 0.01 level (2-tailed)**,** indicating that the associations are not due to chance.

The results show that *Usefulness* has a strong positive correlation with *Autonomy* ($r = .726$, $p < .01$) and *Competence & Relatedness* ($r = .744$, $p < .01$). This means that as students perceive GenAI tools to be more useful, their sense of autonomy and competence in classroom activities increases.

Similarly, *Ease of Use* is positively correlated with *Autonomy* ($r = .716$, $p < .01$) and *Competence & Relatedness* ($r = .715$, $p < .01$), implying that when GenAI tools are easier to use, students feel more confident, capable, and connected in their learning.

Overall, the findings indicate that the relationship between GenAI utilization and classroom engagement is statistically significant and strongly positive. Therefore, the null hypothesis is rejected. Therefore, there is a significant relationship exists between the extent of the utilization of GenAI and students' classroom engagement. This implies that greater usefulness and ease of use of GenAI tools contribute to higher levels of autonomy, competence, and relatedness among students in classroom settings.

5. Discussions

The findings of this study revealed that students extensively utilized generative artificial intelligence (GenAI) tools in their academic activities, perceiving them as highly useful and easy to use. The overall weighted mean of 3.82 indicated that GenAI tools were integrated into students' learning processes to a great extent, particularly for enhancing understanding, improving task efficiency, and refining the quality of academic outputs. These results aligned with previous studies that underscored how GenAI applications such as ChatGPT, DALL·E, and Copilot had transformed learning by enabling personalized assistance, providing adaptive feedback, and fostering cognitive engagement (Hu & Chan, 2023; Luo et al., 2024; Sardi et al., 2025). Similar to the conclusions of Li et al. (2024), the perceived usefulness and ease of use of AI technologies were primary determinants of student engagement, consistent with the principles of the Technology Acceptance Model (Davis, 1989; Dwivedi et al., 2023).

Students also exhibited high levels of engagement in the classroom, particularly in the domains of autonomy, competence, and relatedness. The weighted mean of 3.57 demonstrated that GenAI supported self-directed learning, improved confidence, and nurtured a sense of connectedness with academic tasks. These outcomes were in line with the Self-Determination Theory framework, which suggested that autonomy, competence, and relatedness were essential for intrinsic motivation and sustained engagement (Deci & Ryan, 2015; Ryan & Deci, 2017). The results confirmed that when GenAI tools empowered students to make independent learning decisions and provided immediate, constructive feedback, they developed stronger self-efficacy and deeper cognitive involvement (Du & Alm, 2024; Gao et al., 2024; Kong & Yang, 2024). This pattern was consistent with Chiu (2024), who emphasized that GenAI could serve as a self-regulation catalyst that increased intrinsic motivation among higher-education learners.

The correlation analysis showed a significant positive relationship between the extent of GenAI utilization and students' engagement, indicating that greater usefulness and ease of use of GenAI tools were associated with higher levels of autonomy, competence, and relatedness. This finding echoed earlier research by Liang et al. (2023) and Shahzad et al. (2024), which demonstrated that students' interaction with AI tools promoted self-efficacy and engagement through feedback mechanisms and creative learning tasks. The result also confirmed the claim of Pang and Wei (2025) that GenAI innovations shaped a new paradigm in higher education where technology not only automated processes but also enhanced human agency and learning performance.

However, despite the positive relationship, the study indicated moderate engagement in collaborative or discussion-based activities, suggesting that GenAI might have primarily enhanced individual rather than social aspects of learning. This supported previous

observations that while GenAI strengthened cognitive and behavioral engagement, it sometimes reduced peer interaction and over-reliance on automated systems (Zhang & Xu, 2024; Chan & Tsi, 2024). Furthermore, the findings emphasized the importance of guided policies and ethical use frameworks to prevent academic dishonesty and maintain equitable access, as advocated by Williams (2024) and Kazley et al. (2024).

The outcomes of this study provided the foundation for a policy brief that aimed to guide institutional and national strategies on the responsible integration of Generative AI in higher education. The policy brief emphasized the need for clear ethical frameworks, academic integrity protocols, and capacity-building initiatives that align with both institutional goals and DHERST's digital transformation agenda. By translating the empirical results into actionable policy directions, the brief underscored how evidence-based decision-making could promote equitable access, innovation, and sustained engagement across learning environments. This linkage between research and policy reinforced the vital role of data-driven insights in shaping the governance of emerging technologies in Papua New Guinea's higher education sector (Cacho, 2024; Williams, 2024; DHERST, 2025).

Overall, the study contributed empirical evidence from the Papua New Guinea higher-education context, illustrating that GenAI was an effective catalyst for learning engagement when aligned with student autonomy and institutional support systems. As other researchers noted, such context-based investigations were essential to ensuring that GenAI integration supported inclusive and culturally relevant pedagogical practices (Fawaz et al., 2025; Cacho, 2024; Hromada & Zábojník, 2024).

6. Conclusions

The study concluded that generative AI tools were significantly and positively related to students' classroom engagement in a private higher education institution in Papua New Guinea. Students perceived GenAI as both useful and easy to use, particularly in facilitating learning efficiency, improving understanding, and supporting academic success. The strong correlations between GenAI utilization and the components of engagement, such as autonomy, competence, and relatedness, demonstrated that these tools effectively promoted self-directed and motivated learning.

Furthermore, the findings showed that GenAI strengthened learners' confidence and self-efficacy through personalized feedback and adaptive learning pathways. However, while it enhanced cognitive and behavioral engagement, it did not fully extend to social interaction or collaborative participation, suggesting a potential gap in fostering peer engagement. Overall, the study affirmed that responsible and strategic integration of GenAI in higher education could elevate teaching and learning practices when guided by clear ethical and pedagogical frameworks.

7. Recommendations

Based on the findings and conclusions, the following recommendations were proposed:

1. *Policy Development and Ethical Frameworks:*
   Higher education institutions in Papua New Guinea should develop clear policies that define the appropriate use of GenAI tools in academic settings. These guidelines should emphasize ethical use, originality, and data privacy to ensure academic integrity.

2. *Faculty Training and Pedagogical Integration:*
   Educators should be trained to integrate GenAI meaningfully into instructional design, using it to complement, not replace, human facilitation. Training should focus on maximizing student engagement and promoting collaborative learning.

3. *Student Capacity Building:*
   Students should receive orientation programmes and workshops to build digital literacy, self-regulation, and responsible use of GenAI for learning enhancement.

4. *Encouraging Collaborative Engagement:*
   Institutions should promote AI-supported peer collaboration through group-based projects and interactive learning platforms that balance autonomy with relatedness.

5. *Continuous Research and Monitoring:*
   Further research should be conducted to evaluate the long-term effects of GenAI on student motivation, ethical behavior, and learning outcomes, particularly in developing-country contexts.

6. *Infrastructure Enhancement:*
   Universities should invest in reliable digital infrastructure and equitable access to AI tools to ensure that all students, regardless of socioeconomic background, can benefit from GenAI-driven education.

8. Contribution to Practice

This study contributed to educational practice by providing empirical evidence on how GenAI could enhance student engagement within higher education settings, particularly in developing contexts such as Papua New Guinea. The results demonstrated that GenAI tools were not only useful and easy to integrate into classroom activities but also effective in promoting students' autonomy, competence, and relatedness. These findings served as a practical guide for educators and administrators seeking to maximize the pedagogical potential of AI technologies while maintaining a learner-centered environment. The integration of GenAI was shown to support both academic performance and motivation, offering a foundation for technology-enhanced teaching models that could be replicated across similar higher education institutions.

The study also informed teaching practice by emphasizing the importance of designing AI-mediated learning experiences that empower students to take ownership of their learning. Educators could use GenAI to provide personalized feedback, scaffold complex learning tasks, and encourage independent exploration, all of which contribute to higher levels of engagement and motivation. The findings suggested that teachers should be trained not only in the technical use of GenAI but also in pedagogical strategies that balance human guidance with AI assistance. This perspective aligned with current discussions in higher education that call for reimagining teacher roles in AI-supported learning environments.

Furthermore, the study offered insights for institutional leaders and policymakers on how to create enabling environments for responsible AI integration. The positive relationship between GenAI use and engagement underscored the need for universities to invest in infrastructure, digital literacy programs, and ethical policies to support equitable access. Institutional practices could benefit from embedding GenAI frameworks into curriculum design, assessment procedures, and staff development initiatives.

Finally, this research contributed to the growing body of knowledge on AI in education by contextualizing its implementation in a developing country setting. While most global research focused on technologically advanced contexts, this study provided practical insights into how limited-resource institutions could adapt GenAI to improve educational engagement and outcomes. The study thus served as a model for other universities in the Pacific region that sought to integrate emerging technologies responsibly and effectively within their academic systems.

9. Policy Contributions

The study provided significant policy implications for higher education institutions and national agencies overseeing digital transformation and quality assurance in education. The strong correlation between GenAI utilization and student engagement highlighted the need for comprehensive institutional and national policies that guide the ethical, effective, and equitable integration of AI in higher education.

At the institutional level, IBSUniversity could develop or revise its *Generative AI Usage Policy* to include clear protocols on academic integrity, intellectual property, and responsible AI use in assessments. The study's results supported the creation of a *Teaching and Learning Framework for AI Integration*, which would formalize the use of GenAI in instructional design, formative assessment, and research supervision. Policy alignment with the Technology Acceptance Model (TAM) and Self-Determination Theory (SDT) could ensure that AI implementation remains student-centered and pedagogically sound.

At the national level, the study reinforced the initiatives of *DHERST's Policy on Digitalization of Papua New Guinea Universities and Research Institutes (2025)* by providing empirical evidence that GenAI can improve learning outcomes and engagement. Policymakers could use these insights to design national guidelines that encourage universities to integrate GenAI responsibly, ensuring inclusivity across both public and private institutions. Moreover, the research findings supported the inclusion of AI ethics and data governance modules in tertiary curricula to prepare future graduates for ethical decision-making in technology use.

Policy Brief

"Enhancing Student Engagement through Generative Artificial Intelligence (GenAI) in Higher Education"

Executive Summary

This policy brief presents key findings from the study *"The Utilization of Generative AI and Its Correlation on Student Engagement",* conducted in a private higher education institution in Papua New Guinea. The study revealed that students demonstrated a high level of engagement when using Generative AI (GenAI) tools such as ChatGPT, Copilot, and Gemini. These tools enhanced learning autonomy, competence, and relatedness, leading to greater motivation, creativity, and confidence in academic tasks.

The results confirmed a strong positive correlation between GenAI utilization and student engagement, indicating that the more students used GenAI tools purposefully, the more engaged and self-directed they became. However, the findings also highlighted the need for ethical guidelines, teacher training, and equitable access to ensure sustainable and responsible integration of GenAI in education.

Key Findings

- *High Usefulness and Ease of Use:*
  Students perceived GenAI as a helpful and accessible tool that enhanced understanding, efficiency, and the quality of academic outputs.
- *Positive Correlation with Engagement:*
  Statistical analysis confirmed a strong relationship between GenAI use and student engagement across autonomy, competence, and relatedness indicators.
- *Enhanced Autonomy and Competence:*
  GenAI encouraged students to explore, generate ideas independently, and build confidence in managing academic tasks.
- *Moderate Social Interaction:*
  While GenAI promoted independent learning, it showed less impact on collaborative and discussion-based engagement.
- *Need for Ethical and Pedagogical Guidance:*
  Students' reliance on GenAI highlighted the importance of developing ethical frameworks and educator capacity-building to guide responsible usage.

Policy Implications

1. *Institutional Integration:*
   The study supports formal inclusion of GenAI tools within academic policies, course designs, and digital learning frameworks to strengthen student engagement and innovation.
2. *Ethical Governance:*
   Policies should clearly define acceptable use of GenAI in academic activities, addressing plagiarism, intellectual property, and data privacy.
3. *Capacity Building:*
   Faculty members and students require structured training on effective and ethical GenAI usage aligned with curriculum outcomes.
4. *Infrastructure and Accessibility:*

Investment in reliable digital infrastructure and equitable access to AI platforms is essential for inclusive adoption.

5. *Monitoring and Evaluation:*
   Continuous policy review and assessment mechanisms should be established to track the pedagogical and ethical impact of GenAI in higher education.
   .

Policy Recommendations

1. *Develop a Generative AI Institutional Policy*
   IBSUniversity should craft a formal policy that outlines guidelines for the ethical, pedagogical, and administrative use of GenAI tools in teaching, learning, and assessment.
2. *Integrate GenAI into Teaching and Learning Frameworks*
   Encourage academic units to embed GenAI-supported tasks in coursework, formative assessments, and research activities to promote autonomy and creativity.
3. *Implement Faculty and Student Development Programmes*
   Conduct regular workshops and training to strengthen digital literacy, academic integrity, and AI literacy among educators and learners.
4. *Establish Ethical and Academic Integrity Protocols*
   Include AI-use declarations, citation standards, and originality checks in student submissions to uphold transparency and responsibility.
5. *Collaborate with DHERST and Other Universities*
   Partner with DHERST and regional institutions to align institutional practices with national strategies for digital transformation and responsible AI integration.

Conclusion

Generative AI presents a transformative opportunity to enhance engagement, motivation, and academic achievement in higher education. The findings of this study provide a solid empirical basis for developing institutional and national AI education policies. By implementing ethical frameworks, capacity-building initiatives, and inclusive digital infrastructure, Papua New Guinea's higher education institutions can ensure that GenAI becomes a tool for empowerment, innovation, and equitable learning.

References

Australian Council for Educational Research. (n.d.). *Overview*. Australian Council for Educational Research - ACER. https://www.acer.org/au/ausse.

Bandi, A., Adapa, P. V. S. R., & Kuchi, Y. E. V. P. K. 2023. The Power of Generative AI: A Review of Requirements, Models, Input-Output Formats, Evaluation Metrics, and Challenges. *Future Internet*, 15, 260. https://doi.org/10.3390/fi15080260.

Banh, L., & Strobel, G. 2023. Generative artificial intelligence. *Electronic Markets*, 33: 1–17. https://doi.org/10.1007/s12525-023-00680-1.

Batchu, C., & Satya, V. V. 2024. Generative AI: Evolution and Its Future. *International Journal For Multidisciplinary Research*. https://doi.org/10.36948/ijfmr.2024.v06i01.12046.

Bergmark, U., & Westman, S. 2018. Student participation within teacher education: Emphasising democratic values, engagement and learning for a future profession. *Higher Education Research & Development*, 37(7): 1352–1365. https://doi.org/10.1080/07294360.2018.1484708.

Bond, M., Bedenlier, S., Marín, V.I. et al. 2021. Emergency remote teaching in higher education: mapping the first global online semester. *International Journal of Educational Technology in Higher Education*, 18 (50). https://doi.org/10.1186/s41239-021-00282-x.

Cacho, R. 2024. Integrating Generative AI in University Teaching and Learning: A Model for Balanced Guidelines. *Online Learning*. https://doi.org/10.24059/olj.v28i3.4508.

Cambridge University Press & Assessment. 2022. *The Role of Relevance in Learner Engagement | Cambridge English*. What's It Got to Do with Me? The Role of Relevance in Learner Engagement. https://www.cambridge.org /elt/blog/2022/02/10/role-relevance-learner-engagement/.

Cardona, M., Rodriguez, R., & Ishmael, K. 2023. *Artificial intelligence and the future of teaching and learning: Insights and recommendations*. https://www.ed.gov /sites/ed/files/documents/ai-report/ai-report.pdf.

Cavanagh, M. 2011. Students' experiences of active engagement through cooperative learning activities in lectures. *Active Learning in Higher Education,* 12(1): 23–33. https://doi.org/10.1177/1469787410387724.

Chan, C. K. Y., & Tsi, L. H. Y. 2024. Will generative AI replace teachers in higher education? A study of teacher and student perceptions. *Studies in Educational Evaluation*. https://doi.org/10.1016/j.stueduc.2024.101395.

Chau, S., & Cheung, C. 2018. Academic satisfaction with hospitality and tourism education in Macao: The influence of active learning, academic motivation, and student engagement. *Asia Pacific Journal of Education*, *38*(4): 473–487. https://doi.org/10.1080/02188791.2018.1500350.

Chiu, T. 2021b. Digital support for student engagement in blended learning based on self-determination theory. *Computers in Human Behavior* 124, 106909. https://doi.org/10.1016/J.CHB.2021.106909.

Chiu, T. 2024. A classification tool to foster self-regulated learning with generative artificial intelligence by applying self-determination theory: A case of ChatGPT. *Educational Technology Research and Development*. https://doi.org/10.1007/s11423-024-10366-w

Chiu, T. K. F. 2024. A Framework for Using GenAI to Support Student Engagement in Interdisciplinary Learning from Self-determination Theory. *ASCILITE Publications*. https://doi.org/10.14742/apubs.2024.1053.

Creswell, J.W. and Creswell, J.D. 2018. R*esearch design: Qualitative, quantitative, and mixed methods approaches.* Sage, Los Angeles.

Cui, Y., Van Esch, P., & Phelan, S. 2024. How to build a competitive advantage for your brand using generative AI. *Business Horizons*. https://doi.org/10.1016/j.bushor.2024.05.003

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly,* 13(3): 319–340. https://doi.org/10.2307/249008.

Dwivedi, Y. K., et al. 2023. So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges, and implications of generative conversational AI for research, practice, and policy. *International Journal of Information Management*, 71, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642.

Deci, E. L., & Ryan, R. M. 2015. Self-Determination Theory. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)*: 486–491). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.26036-4.

DHERST. 2021. *National Higher and Technical Education Plan 2021-2030*. https://web.dherst.gov.pg/phocadownload/higher_education_plans_2022/20221502-nhte-plan-2021-2030.pdf.

Du, J., & Alm, A. 2024. The Impact of ChatGPT on English for Academic Purposes (EAP) Students' Language Learning Experience: A Self-Determination Theory Perspective. *Education Sciences*. https://doi.org/10.3390/educsci14070726.

Dwivedi, Y. K., et al. 2023. So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges, and implications of generative conversational AI. *International Journal of Information Management, 71,* 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642.

Epstein, Z., Hertzmann, A., Herman, L., Mahari, R., Frank, M., Groh, M., Schroeder, H., Smith, A., Akten, M., Fjeld, J., Farid, H., Leach, N., Pentland, A., & Russakovsky, O. 2023. Art and the science of generative AI. *Science*, 380: 1110–1111. https://doi.org/10.1126/science.adh4451.

Fawaz, M., El-Malti, W., Alreshidi, S., & Kavuran, E. 2025. Exploring Health Sciences Students' Perspectives on Using Generative Artificial Intelligence in Higher Education: A Qualitative Study. *Nursing & Health Sciences*, 27 1. https://doi.org/10.1111/nhs.70030.

Freeman, J. 2025. *Student generative AI survey 2025*. https://www.hepi.ac.uk/2025/02/26/student-generative-ai-survey-2025/.

Gao, Z., Cheah, J., Lim, X., & Luo, X. 2024. Enhancing academic performance of business students using generative AI: An interactive-constructive-active-passive (ICAP) self-determination perspective. *The International Journal of Management Education*. https://doi.org/10.1016/j.ijme.2024.100958.

Gursoy, D., Chi, O. H., Lu, L. & Nunkoo, R. 2019. Consumers' Acceptance of Artificially Intelligent Device Use in Service Delivery. *International Journal of Information Management*. 49: 157-169. 10.1016/j.ijinfomgt.2019.03.008.

Groccia, J. E. 2018. What Is Student Engagement? *New Directions for Teaching and Learning*, 2018(154): 11–20. https://doi.org/10.1002/tl.20287.

Holmes, Wayne & Bialik, Maya & Fadel, Charles. 2019. A*rtificial Intelligence in Education. Promise and Implications for Teaching and Learning.* Center for Curriculum Redesign.

Hromada, V., & Zábojník, R. 2024. The Role of Generative AI in Empowering Generation Z in Higher Education. *Media & Marketing Identity*. https://doi.org/10.34135/mmidentity-2024-75.

Hu, W., & Chan, C. 2023. Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20. https://doi.org/10.1186/s41239-023-00411-8.

Hu, W., Tian, J., & Li, Y. 2024. Enhancing student engagement in online collaborative writing through a generative AI-based conversational agent. *Internet Higher Education. 65*, 100979. https://doi.org/10.1016/j.iheduc.2024.100979.

IBSUniversity.2023. *Guideline on Generative Artificial Intelligence Usage in Student Assessment*. https://liveibsac-my.sharepoint.com/personal/qad_ibs_ac_pg/_layouts/15/onedrive.aspx?id=%2Fpersonal%2Fqad%5Fibs%5Fac%5Fpg%2FDocuments%2FAcademic%20Policies&ga=1. [Accessed on June 22, 2025]

Kazley, A., Andresen, C., Mund, A., Blankenship, C., & Segal, R. 2024. Is the use of ChatGPT cheating? Students of health professions perceptions. *Medical Teacher*: 1–5. https://doi.org/10.1080/0142159X.2024.2385667.

Khoo, E., & Kang, S. 2022. Proactive learner empowerment: Towards a transformative academic integrity approach for English language learners. *International Journal for Educational Integrity*, 18. https://doi.org/10.1007/s40979-022-00111-2.

Kong, S.-C., & Yang, Y. 2024. A Human-Centered Learning and Teaching Framework Using Generative Artificial Intelligence for Self-Regulated Learning Development Through Domain Knowledge Learning in K–12 Settings. *IEEE Transactions on Learning Technologies*, 17: 1588–1599. https://doi.org/10.1109/TLT.2024.3392830.

Lesjak, M., Juvan, E., Ineson, E. M., Yap, M. H. T., & Axelsson, E. P. 2015. Erasmus student motivation: Why and where to go? *Higher Education*, 70(5), Article 5. https://doi.org/10.1007/s10734-015-9871-0.

Li, W., Zhang, X., Li, J., Yang, X., Li, D., & Liu, Y. 2024. An explanatory study of factors influencing engagement in AI education at the K-12 Level: An extension of the classic TAM model. *Scientific Reports*, 14. https://doi.org/10.1038/s41598-024-64363-3.

Liang, J., Wang, L., Luo, J., Yan, Y., & Fan, C. 2023. The relationship between student interaction with generative artificial intelligence and learning achievement: Serial mediating roles of self-efficacy and cognitive engagement. *Frontiers in Psychology*, 14. https://doi.org/10.3389/fpsyg.2023.1285392.

Luo, J., Yang, Y., Yang, R., Chen, J., & Yang, M. 2024. From surface to deep learning approaches with Generative AI in higher education: An analytical framework of student agency. *Studies in Higher Education*, 49: 817–830. https://doi.org/10.1080/03075079.2024.2327003.

Lv, Z. 2023. Generative Artificial Intelligence in the Metaverse Era. *Cognitive Robotics*. https://doi.org/10.1016/j.cogr.2023.06.001.

Marikyan, D., S. Papagiannidis, & G. Stewart .2023. Technology acceptance research: Meta-analysis. *Journal of Information Science*. 10.1177/01655515231191177.

Nabilah, S. 2023. DWU, a PNG university, explores Artificial intelligence for learning. *Tech In Pacific*. https://www.techinpacific.com/dwu-a-png-university-explores-artificial-intelligence-for-learning/. [Accessed on October 6, 2025]

OECD. (n.d.). *Student engagement and motivation*. Education GPS. http://gpseducation.oecd.org/.

Pandey, P. and M. M. Pandey 2015. *Research methodology: Tools and techniques.* https://www.euacademic.org/BookUpload/9.pdf.

Pang, W., & Wei, Z. 2025. Shaping the Future of Higher Education: A Technology Usage Study on Generative AI Innovations. *Information*. https://doi.org/10.3390/info16020095.
Policies—Policy on Digitalization of Papua New Guinea Universities and Research Institutes—DHERST. https://web.dherst.gov.pg/policies/file/59-policyondigitalisation-uni-ri. [Accessed on January 31, 2025]

Polye, D. (2024). *Press Statement by the Hon. Don Pomb Plye, CMG, BE (Civil) MBA, MIEPNG, MP*. https://web.dherst.gov.pg/images/2024-pubs/020224_Ministerial_Statement_02.pdf [Accessed on February 2, 2025]

Popenici, Stefan & Kerr, Sharon. 2017. Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12. 22. 10.1186/s41039-017-0062-8.

Post Courier 2025. Pacific Education Ministers embrace the usage of AI and ICT for education outcomes - Post Courier. **https://www.postcourier.com.pg/pacific-education.../** [Accessed on March 21, 2025].

Ryan, R. M., & Deci, E. L. 2017. *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. Guilford Publications. http://ebookcentral.proquest.com/lib/scu/detail.action?docID=4773318

Salesian Institutions of Higher Education. 2023. DBTI Boroko participates in the online session of "Artificial Intelligence: Challenge of our time" hosted by the EAO Social Communication School of Formation. *Salesian Institutions of Higher Education (IUS)*. https://ius-sdb.com/dbti-boroko-online-session-artificial-intelligence-challenge-of-our-time-eao-social-communication-school-of-formation/ [Accessed on, May 15, 2025].

Sardi, J., Yanto, D. T. P., Eliza, F., Yuliana, D. F., Darmansyah, Candra, O., & Habibullah. 2025. How Generative AI Influences Students' Self-Regulated Learning and Critical Thinking Skills? A Systematic Review. *International Journal of Engineering Pedagogy.* 15 (1): 94–108. https://doi.org/10.3991/ijep.v15i1.53379

Sengar, S., Hasan, A. B., Kumar, S., & Carroll, F. 2024. Generative Artificial Intelligence: A Systematic Review and Applications. *ArXiv*, *abs/2405.11029*. https://doi.org/10.48550/arXiv.2405.11029

Shahzad, M. F., Xu, S., & Zahid, H. 2024. Exploring the impact of generative AI-based technologies on learning performance through self-efficacy, fairness & ethics, creativity, and trust in higher education. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12949-9.

Shanto, S. S., Ahmed, Z., Rime, Most. H. K., Morol, Md. K., Fahad, N., Hossen, Md. J., & Abdullah-Al-Jubair, Md. 2024. The Generative AI Landscape in Education: Mapping the Terrain of Opportunities, Challenges, and Student Perception. *IEEE Access*, 12: 147023–147050. https://doi.org/10.1109/ACCESS.2024.3461874.

Spitzig, J., & Renner, B. J. 2022. Student Engagement and Retention of Adult Learners at Community Colleges. *Journal of College Student Retention: Research, Theory & Practice*, 152102512211380. https://doi.org/10.1177/15210251221138065

University of Waterloo. (n.d.). *2a. The importance of student engagement*. Fostering Engagement: Facilitating Online Courses in Higher Education. https://contensis.uwaterloo.ca/sites/open/courses/FEFOCHE/toc/unit-2/2a.aspx.

Wang, M., & Degol, J. 2014. Staying Engaged: Knowledge and Research Needs in Student Engagement. *Child Development Perspectives*, 8(3): 37–143. https://doi.org/10.1111/cdep.12073.

Warankar, M. 2024. Generative Artificial Intelligence. *International Journal of Scientific Research in Engineering and Management*. https://doi.org/10.55041/ijsrem31146.

Weissman, S. 2022. *A Massive Disruption, a Range of Student Reactions*. Inside Higher Ed. https://www.insidehighered.com/news/2022/02/02/how-pandemic-affected-student-engagement. [Accessed on February 1, 2025]

Williams, R. T. 2024. The ethical implications of using generative chatbots in higher education. *Frontiers in Education*. https://doi.org/10.3389/feduc.2023.1331607.

Wood, D., & Moss, S. 2024. Evaluating the impact of students' generative AI use in educational contexts. *Journal of Research in Innovative Teaching & Learning*. https://doi.org/10.1108/jrit-06-2024-0151.

Wu, F., & Teets, T. S. 2021. Effects of the COVID-19 Pandemic on Student Engagement in a General Chemistry Course. *Journal of Chemical Education*, 98(12): 3633–3642. https://doi.org/10.1021/acs.jchemed.1c00665.

Xia, Q., Chiu, T., Lee, M. K., Sanusi, I., Dai, Y., & Chai, C. 2022. A self-determination theory (SDT) design approach for inclusive and diverse artificial intelligence (AI) education. *Computers and Education.* 189, 104582. https://doi.org/10.1016/j.compedu.2022.104582.

Ye, Y., Hao, J., Hou, Y., Wang, Z., Xiao, S., Luo, Y., & Zeng, W. 2024. Generative AI for Visualization: State of the Art and Future Directions. *Visual Informatics*, 8: 43–66. https://doi.org/10.1016/j.visinf.2024.04.003.

Zepke, N., Leach, L., & Butler, P. 2014. Student engagement: Students' and teachers' perceptions. *Higher Education Research & Development*, 33(2): 386–398. https://doi.org/10.1080/07294360.2013.832160.

Zhang, L., & Xu, J. 2024. The paradox of self-efficacy and technological dependence: Unraveling generative AI's impact on university students' task completion. The *Internet and Higher Education.* 65, 100978. https://doi.org/10.1016/j.iheduc.2024.100978.

Zhang, P., & Boulos, M. 2023. Generative AI in Medicine and Healthcare: Promises, Opportunities and Challenges. *Future Internet*, 15, 286. https://doi.org/10.3390/fi15090286. https://consensus.app/papers/how-students-use-ai-feedback-matters-experimental-zhang-liu/fec6e43c450857eeb71788d2fe9a5731/.

Zhoc, K. C. H., Webster, B. J., King, R. B., Li, J. C. H., & Chung, T. S. H. 2019. Higher Education Student Engagement Scale (HESES): Development and Psychometric Evidence. *Research in Higher Education*, 60(2): 219–244. https://doi.org/10.1007/s11162-018-9510-6.