Navigating the Complexities of GenAI in Bhutanese Higher Education: Leveraging Its Potential for Transformative Learning

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Abstract

Reshaping the way knowledge is created, accessed, and applied, Generative Artificial Intelligence (GenAI) has transformed the higher education ecosystem worldwide. Its unprecedented influence on learning, teaching, assessment, and research practices calls for robust governance of the education system to uphold the principle of academic integrity and authentic learning.

While GenAI has enabled personalised learning pathways that support exploration and deep dives, it has also redefined the roles of educators and learners within an increasingly interconnected digital and knowledge ecosystem.

Against this backdrop, for Bhutanese higher education, the question is no longer whether to embrace GenAI, but how to put in place a strategy to foster responsible, ethical, and meaningful use within Bhutan's educational, cultural, and development context.

Hence, this paper calls for a proactive human-centred and GNH-informed GenAI strategy to help Bhutanese higher education institutions, including the Royal University of Bhutan, move beyond a reactive response. This should help leverage the full potential of GenAI optimally for personalised learning, assessment reform, faculty development, research support, and institutional innovation.

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Additionally, the paper examines the risks associated with academic integrity, overreliance, inequitable access, cultural biases, data privacy, and erosion of critical thinking.

As a countermeasure, a Bhutanese pathway for responsible GenAI integration based on clear policy, AI literacy, authentic assessment, faculty capacity building, Bhutanese content development, and ethical governance is being proposed. The proposals are based on the premise that GenAI can support transformative learning only if it strengthens and does not replace human judgement, creativity, compassion, purpose, and the struggles and rigour that deep learning demands.

Keywords: Academic integrity, AI literacy, Bhutan, GenAI, Higher education.

Introduction

Generative Artificial Intelligence (GenAI) has entered the everyday practice of education at a faster pace than one might have thought, fostering increasing dependency among educators and learners alike, facilitating a faster generation of essays, lesson plans, summaries, images, computer code, translations, quizzes, research outlines, and assessment analyses, to name a few,

GenAI has brought convenience and promptness at one's fingertips, but mostly at the cost of authentic learning. This development in the context of the higher education system has affected long-revered assumptions related to authorship, originality, assessment, research, and the role of educators.

It has also presented unprecedented opportunities and possibilities for personalised learning, inclusive approaches to education, multilingual support, curriculum and teaching-learning innovations, and academic productivity.

This reality has made it nearly impossible to take deliberate measures to dissociate GenAI from the education ecosystem. Literature on GenAI use in education systems suggests that banning GenAI is neither a realistic nor an educationally appropriate measure.

For instance, Kasneci et al. (2023) argue that large language models provide opportunities for personalised learning, content generation, and student engagement, but also require new competencies among teachers and learners to understand the technology as well as their limitations and the unexpected brittleness of such systems.

Similarly, guidance for generative AI in education and research by UNESCO stresses that it must be governed through human-centred policy, data protection, ethical validation, and capacity development, and that it must not be left to uncontrolled adoption or narrow detection-based responses (UNESCO, 2023).

For Bhutan, GenAI has arrived at a critical juncture of the educational and digital transformation journey, receiving appropriate policy support. For instance, the 13th Five-Year Plan places digital transformation at the core of national development by promoting the digital economy, digital business and as a regional hub for green data centres (Royal Government of Bhutan, 2024).

The Bhutan National AI Strategy (GovTech Agency, 2025) further positions AI within the vision of "AI for a Thriving Bhutan: Innovation rooted in GNH", framing education, culture and language, public service delivery, health, agriculture, tourism, green energy, and biodiversity as key focus areas. Ethics, inclusivity, transparency, fairness, and accountability in AI development aligned with GNH principles are also emphasised.

Within this global and national context, the Bhutanese higher education institutions (HEIs) cannot simply remain passive onlookers or users in the rapidly evolving landscape of GenAI. It is crucial to acknowledge that everyone in the system is making use of GenAI, ranging from the generation of AI-assisted assignments by students to the use of AI by educators to assess students' work, experimenting with AI-supported literature searches, summarising, editing, coding, and data analysis by researchers, and using it to improve institutional planning and student support by administrators.

The real challenge emerges from informal use outpacing institutional policy and capacity. Consequently, the Bhutanese higher education system needs to adopt a balanced approach of avoiding uncritical celebration or defensive prohibition. Rather, the priority should be on promoting

contextual, ethical, responsible, and transformative use of GenAI for the positive benefits it has on educational practices.

GenAI and Transformative Learning

Among a wide range of promising contributions of GenAI, its enormous potential to support learning beyond the limits of time, space, and access to educators remains novel and impressive.

For the Bhutanese education system, where students come from diverse socio-economic, linguistic, academic, and geographic backgrounds, GenAI presents an opportunity for self-paced learning and guidance. While some students are confident academic writers, others struggle with English-medium academic communication; some are highly intelligent and have good parental support, while others come from families with minimal or no guidance for their studies.

Fortunately, GenAI can support all types of students, irrespective of their cognitive level or family support. It can explain and make difficult concepts simpler by generating examples, offering practice questions, translating ideas, and providing immediate feedback.

A recent study by Tamang et al. (2026), involving 180 students across five colleges of the Royal University of Bhutan (RUB), reported that students consider GenAI to be useful for quick access to information, personalised learning, and emotional support. Besides aligning with many international studies reporting the benefits of GenAI in education, it indicates that Bhutanese students have not been left out of the global GenAI trend.

More importantly, it presents the positive influence of GenAI in expanding students' access to learning support and academic engagement, including emotional support. Studies show GenAI effectively facilitates and supports conversations, personalised interactions, and empathetic communications (Tamang et al., 2026), besides providing a sense of intimacy through social presence (Oh et al., 2018), support for self-disclosure, emotional expressiveness, unconditional support, and trust (Policarpo, 2015).

In terms of teacher education, GenAI could provide a wide range of support, such as lesson planning, microteaching, differentiated instruction,

assessment design, and reflective practice. For instance, a student teacher preparing a science lesson on photosynthesis could ask GenAI to create explanations and instructions for students of different learning abilities.

Accordingly, it could generate varying levels of explanations and questions that promote inquiry and ultimately connect the lesson to the Bhutanese educational context and enable transfer of learning to real-life situations. Similarly, a varying level of explanations and discussions to prompt critical thinking can be generated for a lesson on Bhutanese culture.

However, the professional responsibility of educators remains essential to check accuracy, adapt materials relevant to the standards identified in the Bhutanese curriculum, ensure age appropriateness of the tasks designed, and aligning it with local practices and classroom realities.

Undoubtedly, GenAI presents immense potential in professional and technical education. For instance, at the technical college, students may use GenAI to debug code, compare engineering designs, and/or test alternative solutions. Students could explore ideas and information on software development, data analytics, cybersecurity scenarios, and human-computer interaction cases.

GenAI can also be used to support learning about agriculture, climate adaptation, pest management, biodiversity, and sustainable livelihoods. For business and governance programmes, students could use GenAI to prepare policy briefs, entrepreneurship proposals, financial summaries, and market analyses.

However, both educators and students will need to ensure that they verify the evidence and contextualise assumptions to the realities of Bhutan.

All these examples demonstrate that the value of GenAI does not lie in replacing learning, but in expanding the conditions for learning, by differentiating instructions and explanations, providing actionable feedback, creating more opportunities to practice, and simplifying difficult concepts and information into a form that can be easily grasped.

Nonetheless, such teaching and learning become a reality only if students are taught to question AI outputs, compare sources, identify biases, use human judgement and ascertain the relevance to the local context.

Academic Integrity and Need for Assessment Reform

One of the most unprecedented concerns created by GenAI in the context of higher education is academic integrity vis-à-vis authentic learning.

Since GenAI can produce full essays, summaries, reflections, lesson plans, research proposals, and, in fact, everything relating to learning and assessments, it has become increasingly difficult to authenticate whether the works submitted by students truly represent their efforts and learning. The concern relating to students' authentic learning, therefore, keeps looming as GenAI becomes more capable of generating academic content, making the authenticity and originality of students' work more questionable.

However, these concerns are not merely technical but form the very foundation of public trust in higher education, where consistent effort must be put in to ensure that the grades reflect authentic learning, and qualifications represent competence, enabling graduates to effectively navigate real-world challenges and create actionable solutions.

Recent literature confirms that GenAI presents both opportunities and risks. For instance, the systematic review by Bittle and El-Gayar (2015) found that GenAI can enhance engagement and efficiency but presents significant risks related to academic dishonesty and diminishing critical thinking among students.

Similarly, a scoping review on GenAI and assessment in higher education by Xia et al. (2024) argues that assessment practices must be transformed to promote students' self-regulated learning, responsible use of AI, and academic integrity.

The concerns related to authentic learning are valid, as overreliance on AI can negatively affect students' cognitive abilities, including critical thinking, analytical reasoning, and decision-making (Zhai et al., 2024). All these pieces of evidence call for stronger digital literacy, review of assessment

practices, and policy responses, to have a fair balance between innovation and academic integrity.

In Bhutan, Dorji's (2026) study on the impact of GenAI on academic assessment in higher education revealed that the lecturers support and recognise the educational value of GenAI in students' learning. However, they remain concerned about plagiarism, overdependence, skill erosion, impact on the rigour and struggles of learning, and weak institutional support.

Based on all these studies, the central issue is not about whether GenAI should be used in higher education; rather, they highlight the need to redesign assessment and teaching practices to protect authentic learning while enabling responsible and meaningful use of AI.

Against these concerns, higher education institutions should not restrict interventions to just stricter policing or dependence on AI-detection tools, given their own limitations in detecting AI-generated essays and assignments. Additionally, overreliance on these AI-detection tools may lead to creating mistrust between students and lecturers.

The Bhutanese higher education institutions, therefore, must focus on meaningful assessment reform that demands authentic thinking and learning. Higher education academics need to design assessments that ensure the authenticity of the students' work by making them more process-oriented.

Some of the tasks may include a requirement for local evidence, an oral defence, field engagement, practical demonstration, iterative drafting, personal reflection, problem-solving, case studies, and application to Bhutanese or local contexts. The focus of assessment should shift from detecting AI use to verification of students' actual understanding, judgement, and ability to apply knowledge meaningfully.

For instance, the AI assessment scale proposed by Furze et al. (2024) or a similar model, could be used as one of the measures. Furze et al.'s (2024) model consists of five levels, ranging from no AI to full AI, enabling educators to design assessments that focus on areas requiring human input and critical thinking.

The model helps to clarify whether the AI is prohibited, permitted for brainstorming, allowed for editing, used collaboratively, or fully integrated into the assessment tasks. The study reports that such strategies contribute to reducing GenAI-related misconduct and support more transparent and learner-centred assessment practices.

AI Literacy for Students and Staff

The integration of GenAI in learning requires AI literacy among both students and faculty members. Students need to understand the capabilities and limitations of GenAI. Since GenAI can produce inaccurate, biased, hallucinated, or fabricated content, students must be taught to evaluate AI-generated responses, cross-check sources, acknowledge AI use, and protect personal or institutional data carefully and critically.

Above all, students need to understand the trade-offs that come with overreliance on AI. While GenAI can support learning in various ways, excessive dependence on it may prevent students from achieving the intended learning outcomes at each level of study.

For instance, if students use AI to complete tasks without engaging deeply in reading, comprehending, synthesising, writing, solving problems, reflecting, and critically analysing, they might end up producing highly polished outputs without developing the competencies in the form of knowledge, skills, values and judgement expected of them.

Hence, AI literacy must help students develop the need to recognise both the benefits and limitations of GenAI, so that they use it as a tool to support learning and not replace the genuine academic effort required for independent thinking, creativity, and academic responsibility.

The AI Competency Framework for Students by UNESCO (UNESCO, 2024) identifies 12 competencies across four dimensions, which consist of human-centred mindset, ethics for AI, AI techniques and applications, and AI system design. The framework highlights the need for students to be responsible users and co-creators of AI, and not just passive consumers of AI-generated content (Miao et al., 2024). This is highly relevant for Bhutan, as higher education must prepare graduates not only to use

imported AI tools but to become key players in shaping AI applications that serve Bhutanese society.

Similarly, higher education academics also require structured professional development programmes to develop the knowledge, skills, competencies, and confidence to integrate GenAI responsibly into teaching, learning, assessment, and research, with a proper understanding of the associated consequences.

Professional development programmes related to application of AI in higher education should not only provide higher education academics with adequate knowledge and skills in the fundamentals of AI and popular AI tools, but should also promote understanding of the capabilities and limitations of GenAI, and more importantly, the need to redesign assessment tasks, guide students on ethical use of AI, verify AI-generated content, protect data privacy, and promote authentic learning.

In the absence of adequate professional development and awareness regarding the implications of using AI, academics and educators may risk seeing AI as a threat and may resist the use of GenAI completely, or use it without sufficient pedagogical and ethical understanding.

The AI Competency Framework for Teachers is a useful reference to design professional development programmes for academics in the colleges under RUB and other HEIs.

The framework identifies 12 competencies across five dimensions: A human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (UNESCO, 2024). The framework emphasises that teachers need competencies not only in using AI tools, but also in understanding ethical issues, applying AI pedagogically, protecting learners' interests, and using AI for continuous professional learning.

Through targeted professional development programmes, HEI academics must be equipped with relevant AI competencies to make informed, ethical, and context-sensitive decisions about GenAI use in teaching, assessment, research, and student support. However, such training must not be a one-time effort, but a continuous programme to effectively respond to the

rapidly and continuously evolving nature of GenAI and its influence in education.

Overdependence, Inequality, Cultural Bias, and Data Privacy

Zhai et al. (2024) point out that overreliance on AI dialogue systems can inadvertently affect cognitive abilities, such as critical thinking, analytical skills, and decision-making.

Against this backdrop, overdependence on GenAI is a growing concern among individuals in society, including students and academics/educators. The situation is aggravated by AI hallucinations, algorithmic bias, plagiarism, privacy concerns, and lack of transparency. This development is a cause of concern as the country cannot afford to produce graduates without actual knowledge, skills, values and judgement required for professional practice and national development.

HEIs in Bhutan need to instil a deep understanding in students to view every assignment as a learning process, intended for a specific learning outcome. This should help learners realise that every time a work is outsourced to GenAI, their competencies are weakened based on the level of dependency they have allowed.

As reflected in the Bhutan National AI Strategy (GovTech Agency, 2025), Bhutan faces challenges related to infrastructure, connectivity, skills, cybersecurity, and AI talent development. These risks further widen inequalities by favouring students with better devices, faster internet access, paid subscriptions to AI tools, stronger English, and higher digital confidence.

Hence, promoting GenAI without addressing issues related to accessibility may widen the existing inequalities among students.

Similarly, the risk of cultural bias is evident as many of the GenAI tools are largely trained on Eurocentric or Western-centric culture and English language data. The GenAI tools are susceptible to generating answers that appear fluent but do not necessarily reflect the Bhutanese language, history, law, Buddhist values, governance, multilingual realities, or community knowledge.

For instance, the AI-generated explanation of development could be more inclined towards the conventional definition of economic growth based on Gross Domestic Product (GDP), under-representing Bhutan's humanistic approach of pursuing development through the Gross National Happiness (GNH) lens.

Correspondingly, the GenAI-generated lesson plans may ignore Bhutanese classroom norms, curriculum expectations, social background of students, and Bhutan's rural school realities that are unique and distinct from education settings in other cultures and societies.

Data privacy is also at risk as students and staff may upload unpublished research, official records, institutional documents, or sensitive personal information into GenAI tools without really understanding how data may be stored, processed or reused.

The guidance on GenAI in education and research (UNESCO, 2023) emphasises the need to protect data privacy as the key ethical and regulatory requirement. Similarly, a study by Wang et al. (2024) on generative AI in higher education reports that higher education institutions are increasingly concerned about ethical use, accuracy, plagiarism, data privacy, and discipline-specific guidance. This clearly shows the need for Bhutanese HEIs to develop clear guidelines suited to the regulatory and cultural context of Bhutan's education system.

A Bhutanese Pathway for Responsible GenAI Integration

Higher education institutions in Bhutan require a clear and practical pathway for responsible integration of GenAI. Firstly, a clear policy must be formulated to define acceptable and unacceptable use, disclosure expectations, data privacy rules, and academic misconduct procedures in general.

At the module level, every assessment must specify whether GenAI is prohibited, allowed with limits, required, or open for creative use. Additionally, the assessment tasks need to be redesigned to avoid heavy reliance on AI-assisted written tasks and shift towards practices that foster authentic, localised and process-based assessment practices.

Secondly, AI literacy should form a critical component of graduate competence. In the absence of AI literacy, students may not even acquire competencies in AI and big data, cybersecurity, and technological literacy, along with analytical thinking, creativity, resilience, curiosity, and lifelong learning, all of which are identified as important skills for the future workforce (World Economic Forum, 2025).

Undoubtedly, Bhutanese graduates will need all these skills not only to compete in global labour markets, but also to equip Bhutan with globally trending skills and much-sought-after competencies to contribute to Bhutan's digital transformation, public service innovation, private sector growth, and GNH-based development.

Thirdly, HEIs should contribute to developing AI-ready Bhutanese educational resources. Such content can be focused on Dzongkha and local language materials, Bhutanese case studies, local research datasets, and GNH-informed ethical frameworks.

In particular, teacher education colleges can design AI-integrated pedagogy and assessment practices based on homegrown ideas and knowledge. Similarly, the College of Natural Resources can create local cases on agriculture, biodiversity, and climate resilience, while the Business and IT Colleges could develop content on Bhutanese entrepreneurship, fintech, and digital governance. All such intervention strategies and measures will contribute to reducing cultural dependence on AI-based knowledge imported from other contexts.

Overall, aligning with the Bhutan National AI Strategy (GovTech Agency, 2025), which places AI within the GNH framework to make it citizen-centred, ethical, inclusive, and sustainable, the adoption of GenAI in education should enhance academic engagement and promote authentic learning. It must not come as a substitute for academic effort, critical thinking, creativity, ethical judgement, and deep learning.

Conclusion

Indisputably, GenAI presents Bhutan's higher education with difficult yet promising opportunities to chart a path that is unique to Bhutan. If used mindlessly and carelessly, the threat to weaken academic integrity, widen

inequality, diminish deep learning, promote cultural dependency, and compromise privacy is huge.

However, a wise, intelligent, mindfully calculated, and regulated adoption of emerging AI technology can expand access, personalise learning, support educators and researchers, improve institutional efficiency, and prepare graduates for an AI-enabled society.

Hence, it is not about whether GenAI is good or bad, but rather the ability and readiness of HEIs in Bhutan to shape GenAI based on the values and aspirations of Bhutan. Leveraging a GNH-informed approach would place human wellbeing, ethical responsibility, cultural identity, environmental awareness, and good governance at the centre, allowing education to define the purpose of technology and not otherwise.

The future of Bhutan and the qualities of graduates should not depend on how much GenAI is used, but on how thoughtfully, ethically, and contextually GenAI is supported by HEIs.

AI use declaration: The author declares that AI has not been used in drafting or writing this paper.

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