DESIGNING INTERACTIVE LEARNING EXPERIENCES WITH GENERATIVE AI: A PEDAGOGICAL PERSPECTIVE

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ABSTRACT

Generative Artificial Intelligence (GenAI) has the potential to revolutionize education by enhancing learning experiences, personalization, and teacher support. Because GenAI is a new technology, not many instructors and learners have extensive experience in teaching and learning with it. To integrate GenAI in higher education teaching and learning, educators must stay engaged and informed about GenAI tools, as well as consider how their students may interact with these tools. Higher education instructors acknowledge the potential benefits of GenAI to students, but they also raise concerns about its potential ethical and pedagogical consequences. This study emphasizes the necessity of appropriate policies and guidelines to guarantee the responsible use of technology by students. This study focuses on how GenAI tools are an innovation that may be used in many creative ways to enhance learning outcomes. This study explores the pedagogical approaches that educators might employ while utilizing GenAI tools to enhance the design of lessons and assignments.

Keywords: Generative AI, Pedagogical strategies, Learning outcomes, Ethics, Higher education

1. INTRODUCTION

GenAI tools like ChatGPT, Google Bard, Microsoft Bing, and alike generate new content such as text, images, sounds, videos, and code based on the typed prompts. Based on input, training, and feedback, GenAI technologies keep evolving and learning. GenAI is transforming education. The most effective applications of GenAI technologies in education are concept generation, paraphrasing, synthesis, and information acquisition regarding an overall comprehension of a subject. However, educators are hesitant to use GenAI in their courses for the following reasons: ChatGPT's knowledge is limited beyond 2021; GenAI can offer biased content or harmful instructions; and it can generate inaccurate information(*NC State University – Teaching Resources*, 2023).

Furthermore, students lack prompt engineering specialization, which prevents them from achieving the desired outcomes using GenAI tools. Educators must take into account the increasing significance of prompt literacy while utilizing AI tools and offer a framework for pupils to acquire this competency. Prompt literacy can foster student creativity, provide opportunities for more immersive and interactive learning, and help customize learning experiences (Jacobs and Fischer, 2023).

As GenAI capabilities evolve, it will be critical for learners and educators to maintain positive relationships with technology. Educators should be encouraged to use GenAI proactively and comprehensively, which discourages cheating and unethical use of GenAI (*Academic Affairs*, 2023).GenAI techniques, with their ability to generate a wide range of information, have significant implications for education and research. However, the educational system as a whole is not prepared to adapt new concepts and strategies to ensure that the use of GenAI tools in education enhances, rather than inhibits, students' learning experiences. The reason for this is a lack of institutional policies and formal guidelines

regarding the use of generative AI applications. Most teachers are apprehensive about letting students use GenAI to complete their tasks.

To successfully navigate the exciting new world of artificial intelligence in higher education, educators must develop pedagogical techniques. This study explores how educators are interpreting and addressing the challenges as well as the opportunities presented by the continuous advancements in GenAI. This study is guided by the following research questions:

How can pedagogical approaches be designed to integrate GenAI into higher education teaching and learning?

How to redesign assignments for higher education students to utilize GenAI as a learning tool?

This study addresses the challenges of incorporating GenAI tools into higher education by providing some pedagogical strategies and suggestions for redesigning assignments for students to demonstrate their learning.

2. LITERATURE REVIEW

This literature review explores the potential of AI in education, focusing on the ability of GenAI tools to provide a wide range of information while promoting learning, creativity, and productivity. Yet, the educational system is generally unprepared to pedagogically and ethically incorporate these rapidly expanding tools.

AI in education has the potential to significantly enhance teaching, learning, assessment, and educational administration by enabling teachers to better understand students' learning processes, giving students more personalized and adaptive learning experiences, and supporting machine queries and instant feedback. It is one of the most significant fields of educational research since it promotes the creation of courses and teaching and learning techniques(Chiu et al., 2023).

The use of GenAI tools capable of producing written work that sounds plausibly human-made skyrocketed in popularity in late 2022, raising many concerns in higher education about academic integrity and the validity of work created by our students. While artificial intelligence is not a new concept, the widespread adoption of the GenAI chatbot raises an unparalleled level of awareness of AI's capabilities in our community. Its use is widespread, with students already incorporating it into their final assignments or exams(*ChatGPT and Artificial Intelligence*, 2023).

Instead of attempting to look inside the technology, Bearman and Ajjawi (2023) highlights the need to work with AI black boxes and to encourage educators to interact with the complexities of an AI-mediated environment, orienting them to the contextual problem of ensuring academic integrity in higher education.

Chiu et al. (2023) examined how students used a question-and-answer style to interact with AI agents. For the most part, students found this an enjoyable and useful way to find the answers to basic queries. However, there are certain issues with how student experiences are impacted by chats with these AI tools. As a result, it's still unclear when and how to use chatbots to engage students and promote learning.

Chan and Lee (2023) emphasized how crucial it is to integrate technology with conventional teaching techniques to deliver a more successful learning environment. The findings have implications for the development of evidence-based policies and recommendations for the

integration of GenAI, the development of digital literacy and critical thinking abilities in students, and the promotion of responsible use of GenAI technologies in higher education.

Pratschke (2023) discusses that instead of increasing automation in education, GenAI should promote increased interaction, active learning, and personalization. Educators must consequently prioritize the design of active, collaborative, and constructivist learning over the creation of content. In partnership with GenAI, generativism offers a way to design and deliver learning experiences that are social, collaborative, community-oriented, and human-centered.

Chan and Hu (2023) discusses that policymakers can improve teaching and learning experiences in higher education by developing informed guidelines and procedures for the appropriate and effective adoption of GenAI tools by first understanding students' opinions and resolving their concerns.

Ryall and Abblitt (2023) highlights that learning designers' jobs will inevitably change as a result of GenAI and Large Language Models (LLMs). They must foster AI literacy, including a critical understanding of the possible threats these tools may pose to students, if they are to continue supporting academics with the prudent use of AI in teaching and learning contexts. Learning designers may facilitate informed decision-making and successful integration of AI technology into educational settings by providing advice and guidance to academics as they traverse the complexity of doing so.

This review of the literature aims to identify effective teaching and learning strategies that must be included in education to prepare university teachers and students for the use of these new GenAI technologies.

3. PEDAGOGICAL STRATEGIES FOR THE USE OF GENAI IN HIGHER EDUCATION

For educators working in a variety of teaching and learning environments, this section offers some pedagogical guidance and recommendations while utilizing GenAI. To optimize engagement and eventually influence student outcomes, successful pedagogical techniques need to be created with the learner in mind, regardless of the approach and learning environment. The strategies described in this section are adapted from (*Teaching and Learning with Generative AI/ Teaching Commons*, 2023).

Recognizing GenAI Capabilities: GenAI is incredibly powerful; it can create anything from music and art to text. However, the capacity of GenAI to comprehend context thoroughly and generate outputs that nearly mimic human outputs is what sets it apart. It goes beyond merely having conversations with clever chatbots. To help students critically examine and evaluate generative AI tools on their own, instructors need to recognise the capabilities of GenAI in teaching and learning.

Craft Course Learning Outcomes to support the use of GenAI: A course's design, student learning progress evaluation, and activity facilitation can all be handled with greater ease and effectiveness with well-defined learning outcomes. Creating learning outcomes for a course that allows for the use of GenAI can be difficult. However, it is critical to ensure that the learning outcomes correspond to the course objectives and the needs of the students. One method is to describe the scope of the course as well as the specific areas where GenAI will be applied. This will aid in establishing appropriate learning outcomes for the course. After defining the scope, it is critical to identify the skills and knowledge required to work with GenAI. Learning outcomes should be measurable and relevant to the course objectives. Hands-on experience with GenAI should be provided to students.

Experiment with GenAI yourself: The course instructor should spend some time experimenting with GenAI chatbots to see what kinds of outputs the chatbots produce for the assignments planned for the students. Because tools are always evolving, this must be checked on a frequent basis. Several factors to examine include the resources the chatbot is currently using; references made by the chatbot; comprehensive and fresh answers from the chatbot; particular prompts that are more likely to produce intriguing results; and so on.

Encouraging Intellectual Integrity when utilizing GenAI: Instructors can make it clear to students what they permit or promote in terms of GenAI use, guiding them towards specific applications that improve their course learning. Additionally, educators can explicitly state and ask the students to cite the instances where they used GenAI. Students may cite uses of GenAI that may include requests for additional information and resources to support course learning, explanations, additional ideas, questions, or feedback on their ideas or tasks. Instead of relying on GenAI results blindly, instructors should teach students how to critically analyze them.

GenAI Integration in Course Activities and Assignments: The instructor needs to redesign activities and assignments for the course that purposefully incorporate the usage of GenAI to make course learning accessible for all students and help them fulfil the course learning objectives. With the development of GenAI tools, instructors may ultimately be required to integrate the technology into their lessons and provide students with practice and assistance on how to use and gain knowledge from them. Educators, in collaboration with mental health specialists, should work to create tech-friendly practices to deal with student well-being that may be harmed due to chatting with GenAI chatbots.

Design Course Policies on GenAI use: Students as well as educators have been exploring the usage of GenAI tools in educational settings. It is up to the course instructors to establish their own rules about the use of GenAI tools in their classes. These rules may permit or prohibit the use of the tools in some or all circumstances. These guidelines should be included in course syllabi and communicated to students by the instructors. It is recommended that students seek clarification from their teachers if they have any questions about policies pertaining to generative AI technologies.

Confidentiality in GenAI Tools: Data that is categorized as confidential should not be entered into publicly accessible GenAI tools. Data exchanged with GenAI tools under default settings is not confidential and may reveal sensitive or proprietary data to unauthorized parties. Higher education institutions need to keep an eye on advancements in the rapidly evolving field of GenAI and take into account input from educators and students to update their recommendations.

By adopting these pedagogical strategies, higher education institutions can align their students' actions with their policies and guidelines for the use of GenAI tools, ensuring responsible and ethical GenAI usage. These strategies also reflect the fact that instructors should employ GenAI technology as a supplement to their teaching rather than as a replacement.

4. BEST PRACTICES FOR DESIGNING ASSIGNMENTS TO WORK WITH GENAI

Educators are looking into ways to incorporate different types of organized engagement with GenAI tools into their assignments and learning tasks. Instructors can allow students to explore, develop, and solve problems by creating assignments that use GenAI technology. However, instructors should design activities that encourage students to demonstrate their abilities and expertise responsibly while using AI-generated information. This section

reviews several concepts and methods compiled and remixed from *NC State University – Teaching Resources* (2023) for developing assignments across several disciplines.

Think-Pair-Share Activity: Think-Pair-Share (TPS) is a cooperative learning activity when integrated with GenAI can be utilized in classrooms of any size and for any subject. When teachers ask a question, students are told to think about their answers alone. Students then pair with their classmates and with an AI tool to discuss their answers. Ultimately, the groups disclose to the class as a whole what they discussed with their partner and AI tool, and the conversation proceeds.

AI-generated multiple explanations: In this task, GenAI tools can generate multiple explanations from different perspectives by using a step-by-step approach and adding details to any current explanations by adding more instances. Instructors need to guide students to critically evaluate the various explanations that the GenAI tool has produced for a particular subject. Students need to write and cite sources from specific articles or videos that they referenced to evaluate the AI-generated responses.

AI review of the work: Instructors can expedite the process of grading student assignments by having students receive an AI evaluation of their work beforehand, considering the feedback, making necessary revisions, and then submitting their final assignment. To do this, the instructor can offer a checklist that can be used to complete the assignment evaluation process using the GenAI tool.

Craft mind map of narratives created by AI: Using the GenAI tool, instructors can improve assignments by giving students many AI responses and then asking them to create an improved or unique final result. From an AI-generated story, they may develop a mind map and then locate a predetermined number of supplementary sources to supplement or elaborate on certain mind map portions.

Peer teaching with assistance from GenAI: Peer learning encourages students to learn from each other. For a peer teaching assignment, instructors can give students the task of explaining a concept to their peers. Students should be encouraged to use AI for content assistance and should create a brief task utilizing GenAI tools that can be completed as part of peer teaching. Also, assign pupils the responsibility of responding to queries from instructors and peers.

Debate GenAI tool: Students are assigned topics to debate using the GenAI tool, with students on one side and the AI tool on the other. In this activity, students ask the chatbot a controversial question, follow up with queries that challenge the response, and ask for particular instances. This assignment could serve as the foundation for a reflection exercise regarding the contribution of the GenAI tool to the educational process.

Evidence for an AI-created main points: Instructors may provide students with an article about a particular subject. Next, instruct students to copy and paste an article into the GenAI tool, and ask that the tool highlight the article's main ideas. Next, instruct students to locate sources or additional information that explains each point. This will facilitate their search for supporting data for an AI-generated main point, which will enhance their learning experience.

Identify AI generated response: Instructors may assign two brief articles written by humans and one authored by an AI on some topic. Keep the identity of which of the three articles was created by AI a secret from the pupils. Give them the task of identifying the AI-generated article after reading all three written articles. Students can then reflect on the process and determine how easy or difficult it was to identify the AI-generated piece, as well as what led them to believe it was created by AI, which will provide more meaning to the task.

Writing effective prompts to get the desired output is important in these tasks utilizing GenAI tools; hence, students must be trained in prompt writing skills. To accomplish this, instructors can design prompt-writing tasks to help students engage with GenAI technologies in meaningful and responsible ways. The instructor may direct students to use different prompts to create content for a specific topic and instruct them to document each prompt and record their observations, such as which prompt produced desired outcomes and which produced unexpected results. Then ask them to share their findings with the class (Eaton, 2023). This activity will help students hone their prompt engineering skills.

These are a few ideas for redesigning assignments in the GenAI era, but educators must add additional variants to the traditional active learning teaching techniques that motivate students to build, collaborate, and create original work in any domain by utilising these GenAI technologies.

5. CONCLUSION

This study contributes to a better understanding of the benefits, difficulties, and best practices connected with the integration of GenAI technology in higher education, resulting in improved pedagogical outcomes. While some educators are still learning how to work with this new co-pilot, many are already employing GenAI technologies in a variety of ways in their work; yet, educators appear to be sceptical in advocating for students' use of GenAI tools. However, the existence of GenAI, its broad accessibility, and its influence on student learning must be acknowledged by instructors. This study focused on various strategies to assist instructors in adapting to GenAI tools so they can improve student learning and become an effective component of the teaching and learning space. Additionally, to help students acquire the necessary knowledge and improve as problem solvers, this study explored several ideas for designing and revising assignments in which they can critically analyze and actively engage with GenAI chatbots.

Because few higher educational institutions have set policies and guidelines for the citation and use of AI-generated solutions, each college and university should develop a recommendation for GenAI tools that encourages students to utilize this technology responsibly. As GenAI evolves, educators must continue to incorporate novel activities or approaches into their courses that allow students to employ GenAI tools to complete the specified work.

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