AI in the Classroom: A Comprehensive Framework for ChatGPT Integration in Teaching and Learning in Higher Education

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Abstract

As Artificial Intelligence (AI) technologies advance, their potential for disrupting and transforming educational practices becomes increasingly evident. This paper presents a comprehensive framework for integrating ChatGPT, an AI language model, in teaching and learning settings within the higher education sector. The framework aims to enhance student engagement, foster critical thinking skills, and promote personalised learning experiences mediated by ChatGPT. It addresses integration strategies, student engagement, assessment and feedback, ethical considerations, professional development and evaluation and research. The framework features the importance of leveraging ChatGPT as a technology proxy to empower educators and students to pursue knowledge and further develop digital literacy skills. By utilising this comprehensive framework, educators can unveil the power of ChatGPT to create dynamic and engaging learning environments that foster intellectual growth and prepare students for future technological disruptions of the digital age.

Keywords: AI in education, ChatGPT integration, higher education, personalised learning, assessment strategies.

Introduction

Artificial Intelligence (AI) technologies have emerged as powerful tools that can disrupt and transform various aspects of society, including education (Reyna, 2023). AI can revolutionise teaching and learning practices in higher education, offering new opportunities for personalised and interactive experiences (Firat, 2023). One notable AI technology that holds promise in this context is ChatGPT, an advanced language model developed by OpenAI in November 2022 (Paul, Ueno, & Dennis, 2023) ChatGPT has demonstrated remarkable capabilities in generating human-like responses and engaging in interactive conversations (Qadir, 2023). By integrating ChatGPT into teaching and learning settings, educators can connect its potential to enhance student engagement (Muñoz, Gayoso, Huambo, Tapia, Incaluque, Aguila, Cajamarca, Acevedo, Rivera, & Arias-Gonzáles, 2023), foster critical thinking skills (Rusandi, Ahman, Saripah, Khairun, & Mutmainnah, 2023), and promote genuinely personalised learning experiences (Reyna, 2023).

The integration of ChatGPT in higher education presents exciting possibilities for students, educators, and professional staff. ChatGPT's natural language processing capabilities enable students to interact with it conversationally, simulating a dynamic and interactive learning experience (Rospigliosi, 2023). Through open-ended questioning and dialogue, students can explore complex topics, receive tailored feedback, and instantly access knowledge (Dai, Lin, Jin, Li, Tsai, Gasevic, & Chen, 2023). Moreover, ChatGPT can serve as an intelligent learning companion, guiding and supporting students as they navigate troublesome knowledge, problem-solving scenarios, and research inquiries (Limo, Tiza, Roque, Herrera, Murillo, Huallpa, Flores, Castillo, Peña, & Carranza, 2023).

In addition to its benefits for students, ChatGPT offers significant advantages for educators. The comprehensive framework for ChatGPT integration in teaching and learning proposed in this paper provides educators with a structured approach to leverage its capabilities effectively. By aligning ChatGPT with curriculum objectives and lesson plans, educators can create engaging and interactive

activities that reinforce learning outcomes (Reyna, 2023). Collaborative learning experiences can be fostered by integrating ChatGPT as a shared resource, promoting peer interaction and knowledge exchange (Liu & Gibson, 2023). Furthermore, ChatGPT can support educators in research-related tasks, assisting in literature reviews, guiding students in research inquiries, and offering insights into emerging trends and developments within their fields (Dowling & Lucey, 2023).

However, integrating AI technologies, including ChatGPT, in educational settings requires careful consideration of ethical implications and challenges (Maciel, 2023). Issues such as bias awareness, responsible AI use, privacy concerns, and transparency in AI decision-making processes must be addressed to ensure ethical practices (Derner & Batistič, 2023). Educators must emphasise the importance of critically evaluating information generated by ChatGPT, fostering a discerning approach to AI-generated content.

A new skill that students need to develop is 'Sensemaking', which involves actively interpreting and constructing meaning from information provided by ChatGPT (Lodge, Thompson, & Corrin, 2023). It encompasses how individuals make sense of complex, ambiguous, and uncertain situations, utilising their prior knowledge, cultural context, and available resources.

This study endeavours to furnish educators and students with a holistic framework, empowering them to incorporate ChatGPT proficiently into higher education, thus lubricating the wheels of transformative learning.

Literature review

The use of ChatGPT in higher education has gained attention as a promising tool to enhance teaching and learning experiences. Preliminary research has shown that ChatGPT could engage students in interactive and dynamic learning experiences (Rusandi et al., 2023). Through natural language conversations, students can ask questions, seek clarifications, and receive personalised feedback from ChatGPT, promoting active participation and fostering inquiry (Muñoz et al., 2023). This interactive nature of ChatGPT stimulates deeper engagement with course content, resulting in increased student motivation and enthusiasm (Qadir, 2023).

Furthermore, ChatGPT fosters critical thinking skills by providing opportunities for students to refine their questions, evaluate different perspectives, and analyse complex concepts. As students engage in conversations with ChatGPT, they are challenged to articulate their thoughts and engage in higher-order thinking, promoting the developing and applying critical thinking skills (Bitzenbauer, 2023). Additionally, ChatGPT's assistance in problem-solving activities by offering alternative solutions and guiding students through reasoning further enhances essential thinking abilities (Jones & Smith, 2022).

Another significant benefit of ChatGPT use in higher education is the ability to provide personalised learning experiences (Qadir, 2023). ChatGPT adapts to students' knowledge levels and learning preferences, offering customised explanations, resources, and examples (Zhai, 2023). This personalised approach supports differentiated instruction and promotes self-directed learning, as students receive immediate feedback, track their progress, and identify areas for improvement (Kim, Shim, & Shim, 2023). The adaptive and self-paced nature of interactions with ChatGPT enhances student engagement and empowers learners to take control of their learning journey (Tsai, 2023). Potentially, ChatGPT can foster lifelong learning, which is one of the main objectives of higher education.

Moreover, ChatGPT proves to be a valuable tool for supporting research and inquiry activities in higher education. Researchers can leverage ChatGPT for literature reviews, as it quickly retrieves relevant articles, provides summaries, and identifies connections between research studies (O. Temsah, Khan, Chaiah, Senjab, Alhasan, Jamal, Aljamaan, Malki, Halwani, & Al-Tawfiq, 2023). ChatGPT's vast knowledge base and language understanding capabilities enable it to assist students in formulating research questions, suggesting methodologies, and exploring emerging trends (Liu & Gibson, 2023). As a virtual research assistant, ChatGPT helps students navigate complex datasets and analyse research findings, facilitating the research process and promoting a deeper understanding of the subject matter (Biswas, 2023).

Preliminary research on using ChatGPT in higher education has shown its potential to enhance teaching and learning experiences. However, further research is necessary to address potential challenges and ensure the responsible integration of ChatGPT in educational settings. With careful implementation and consideration of ethical implications, ChatGPT holds excellent promise as a transformative tool in higher education (Adiguzel, Kaya, & Cansu, 2023).

The framework

Developing a framework to guide the insertion of new technologies in teaching and learning helps ensure alignment with educational goals, promotes consistency and coherence, considers pedagogical aspects, enables effective resource allocation, supports ethical and responsible use, and facilitates ongoing evaluation and improvement. The objectives to consider embedding ChatGPT in higher education can be summarised as follows:

- Foster critical thinking and problem-solving skills by encouraging students to engage critically with ChatGPT responses, analyse complex problems and develop practical solutions.
- Promote collaboration via group discussions and problem-solving activities using ChatGPT to explore a topic.
- Support research and inquiry by enabling students to leverage ChatGPT to gather information, explore research topics, and refine their research questions.
- Promote ethical behaviour, accountability and transparency among the students.
- Develop digital literacy skills and empower students to navigate and evaluate information from ChatGPT effectively.
- Ensure academics receive training and support in using ChatGPT in their teaching practices.
- Develop evaluation and research strategies to enhance the ChatGPT-mediated learning experience.
- Make education relevant to the times we live by emphasising 21st-century skills.

Research on using ChatGPT in teaching and learning is emerging as ChatGPT was released six months ago. Based on anecdotal usage of ChatGPT in higher education from conference papers, LinkedIn articles, and webinars, the author visualised six key elements to consider when deploying ChatGPT in higher education. These elements are (i) integration strategies; (ii) student engagement; (iii) assessment and feedback; (iv) ethical considerations; (v) professional development, and: (vi) evaluation and research (Figure 1).

Figure 1: A Comprehensive Framework for ChatGPT Integration in Teaching and Learning in Higher Education.
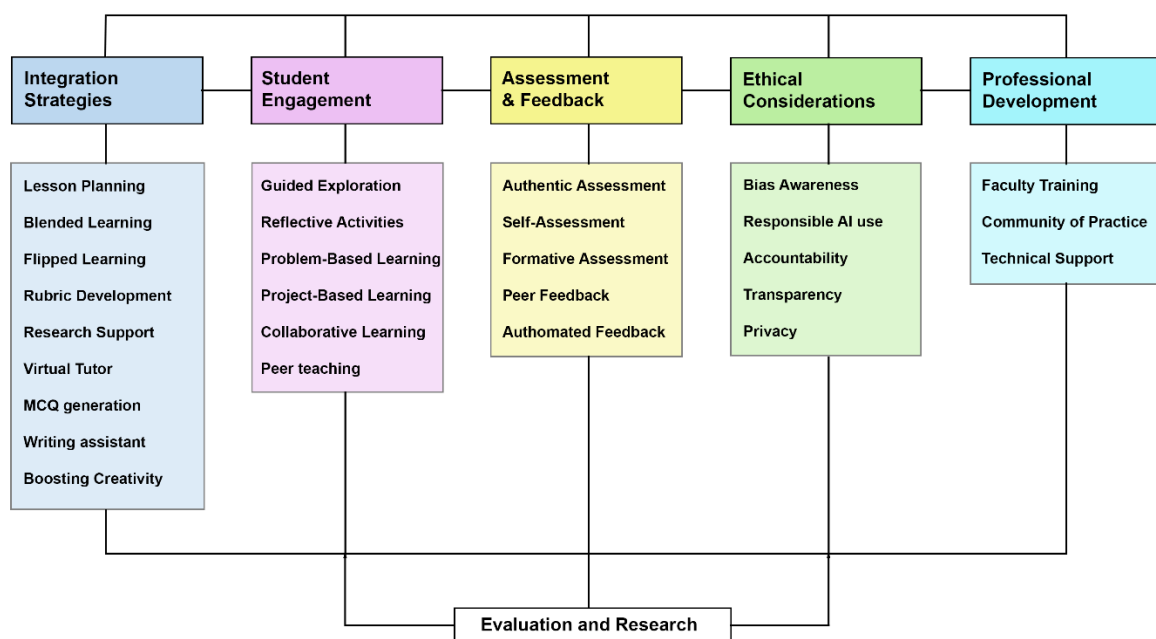
Integration strategies

ChatGPT can be effectively integrated into various courses or disciplines to enhance learning outcomes and align with the curriculum. In lesson planning, educators can design activities and assessment tasks incorporating ChatGPT interactions, reinforcing course concepts, stimulating critical thinking, and promoting problem-solving skills (Reyna, 2023). A blended learning approach can also be adopted, where ChatGPT is seamlessly integrated into this environment. This approach combines online and in-person interactions, facilitating student engagement and collaboration (Bonk & Graham, 2012).

Furthermore, the flipped learning approach can benefit from ChatGPT's capabilities by utilising it as a preparation tool before classroom sessions. By incorporating ChatGPT into the pre-class activities, educators can foster students' lifelong learning skills as they engage with the material and come prepared for deeper discussions in the classroom (Reyna & Meier, 2016). Rubric development can also be improved through the integration of ChatGPT. By utilising a students-as-partners strategy (Matthews, Cook-Sather, Acai, Dvorakova, Felten, Marquis, & Mercer-Mapstone, 2019), educators can co-design marking rubrics with the assistance of ChatGPT, ensuring a comprehensive and fair assessment process.

ChatGPT can serve as a valuable resource for research support. It can guide students in using ChatGPT as a research tool, assisting them in formulating research questions and exploring relevant literature (Liu & Gibson, 2023). Moreover, ChatGPT can be utilised as a virtual tutor 24/7, allowing students to seek clarification, discuss complex topics, and receive personalised guidance (Limo et al., 2023).

In addition to these applications, ChatGPT can be leveraged to create multiple-choice questions (MCQs) for review purposes, enabling students to master the knowledge and assess their understanding (Sun & Hoelscher, 2023). It can also be incorporated as a writing aid, assisting students in improving their writing skills by providing suggestions and feedback (Bašić, Banovac, Kružić, & Jerković, 2023). Lastly, ChatGPT can be utilised during brainstorming sessions to boost creativity by generating new ideas (Lee, 2023)

Student engagement

By facilitating guided exploration and prompting students to interact with ChatGPT, educators can create opportunities for students to gather information, analyse different perspectives, and critically evaluate responses (Qureshi, 2023). This process encourages active engagement and helps students develop information literacy and critical thinking skills.

Incorporating reflective activities is valuable in helping students analyse their interactions with ChatGPT (M.-H. Temsah, Jamal, & Al-Tawfiq, 2023). Through guided reflection, students can evaluate their decision-making process, consider potential biases or limitations in the AI model's responses, and develop a deeper understanding of the technology's strengths and limitations.

Problem-Based Learning (PBL) (Caramori, Abbade, Weber, Neto, Reis, Oliveira, & Thabane, 2019) can be effectively used with ChatGPT in the classroom. By presenting students with real-world problems to solve collaboratively, while utilising the AI model as a resource, students engage in authentic, inquiry-based experiences. PBL fosters critical thinking, problem-solving, and collaboration skills (Pluta, Richards, & Mutnick, 2013), all of which could be enhanced through the integration of ChatGPT.

Project-Based Learning (PjBL) (Kokotsaki, Menzies, & Wiggins, 2016) is another pedagogical approach that can leverage ChatGPT in the classroom. Students engage in hands-on, research-oriented activities by empowering them to actively explore and create projects while utilising the AI model as a resource and collaborator. PjBL promotes student autonomy, research skills, and the application of knowledge in real-world contexts.

Promoting collaborative learning (Magen-Nagar & Shonfeld, 2018) is essential when using ChatGPT in the classroom. Assigning group activities where students work together to solve problems, discuss ChatGPT responses, and share insights enhances collaboration skills. It allows students to benefit from different perspectives and collectively deepen their understanding of the AI model's capabilities and limitations.

Peer teaching (Stigmar, 2016) could be a valuable instructional strategy for ChatGPT. By fostering collaborative learning environments, where students act as both learners and teachers and use the AI model as a tool for knowledge sharing, students engage in peer-to-peer interactions that promote knowledge construction and a deeper understanding of the content.

Assessment and Feedback

Designing authentic assessments (Herrington & Herrington, 1998) that evaluate students' ability to apply critical thinking skills and problem-solving techniques and effectively use ChatGPT as a learning resource enhances the integration of the AI model in the classroom. These assessments can include real-world scenarios or complex problems requiring students to utilise ChatGPT to gather information, analyse data, and propose solutions. By incorporating authentic assessments, educators can assess students' proficiency in using ChatGPT for meaningful learning outcomes.

Self-assessment (Martínez, Rodríguez, & Rodríguez-Arroyo, 2015) could link ChatGPT to the classroom. Encouraging students to reflect on their learning, critically evaluate their understanding and progress, and use the AI model as a resource for feedback and guidance could promote metacognitive skills and fosters independent learning. Students can engage in self-assessment by comparing their responses with the information generated by ChatGPT, identifying gaps in knowledge, and devising strategies to improve their skills and knowledge independently.

Formative assessment (Schildkamp, van der Kleij, Heitink, Kippers, & Veldkamp, 2020) could be effectively linked to ChatGPT in the classroom. By utilising the AI model to collect ongoing data on students' progress, educators can provide immediate feedback, identify misconceptions, and adapt instructional strategies to support individual students' needs. The continuous feedback loop facilitated by ChatGPT enables personalised instruction, helping students to monitor their learning and make necessary adjustments in real-time.

Incorporating peer feedback (Tan & Chen, 2022) could provide valuable opportunities for students to evaluate and provide constructive criticism on each other's interactions with ChatGPT. Peer feedback enhances collaboration, communication skills, and critical thinking abilities as students analyse and provide suggestions for improving the quality of responses generated by ChatGPT. This collaborative process fosters a deeper understanding of the AI model's strengths and limitations while promoting a supportive and interactive classroom environment.

Automated feedback (Tian & Zhou, 2020) using ChatGPT can streamline the assessment process in the classroom. By leveraging the AI model's capabilities, educators can provide efficient and consistent feedback on students' work, enabling timely assessment and support for their learning process. Automated feedback saves time and provides students with immediate insights into their performance, allowing them to make necessary revisions and improvements to their work.

Ethical Considerations

Incorporating bias awareness into the classroom is essential when using ChatGPT (Reyna, 2023). Educators should foster open discussions on the biases and limitations of AI systems, including potential biases in ChatGPT responses, and encourage students to evaluate information critically. By doing so, students can develop a critical mindset and actively assess the information provided by the AI model.

Promoting responsible AI use is another critical aspect of integrating ChatGPT in the classroom. Educators should educate students about the ethical considerations surrounding the use of AI, privacy concerns, and the importance of verifying information from reliable sources. By emphasising responsible use, students can understand the implications of relying solely on AI-generated details and learn to exercise caution and discretion when using ChatGPT.

Accountability could be linked to ChatGPT in the classroom by promoting the responsible and ethical use of the AI model, encouraging students to assess and verify information generated by the AI critically, and fostering a sense of responsibility for the accuracy and integrity of their interactions with the

technology. This approach ensures students understand the importance of validating information and contributes to their overall information literacy skills.

Transparency can be linked to ChatGPT in the classroom by providing clear explanations to students about the capabilities and limitations of the AI model. Educators should ensure that students understand how the technology works and make them aware of the sources and potential biases of AI-generated information. By promoting transparency, educators enable students to make informed decisions about the reliability and trustworthiness of AI-generated content.

The use of ChatGPT and similar language models raises significant privacy concerns. While these models are designed to assist users in generating human-like responses, they can also access vast training data, including public sources and potentially sensitive information. There is a risk that ChatGPT could inadvertently expose personal, confidential, or proprietary information during conversations. Moreover, as a centralised system, there is the potential for data breaches or unauthorised access to stored discussions, further compromising user privacy. Developing and deploying robust privacy safeguards are crucial to mitigate these risks and ensure that the use of ChatGPT respects user privacy rights (Derner & Batistič, 2023).

Professional Development

Faculty training is a crucial step in successfully integrating ChatGPT into higher education. Institutions should provide comprehensive professional development sessions to train educators and professional staff about the capabilities and limitations of ChatGPT. These training sessions should also emphasise the ethical considerations surrounding the use of AI technology and best practices for its integration in the classroom. By equipping faculty with the necessary knowledge and skills, they can confidently leverage ChatGPT to enhance teaching and learning experiences for their students.

Establishing a community of practice (CoP) (Baker & Beames, 2016) can significantly support the effective implementation of ChatGPT in higher education. This community would bring together educators who are using or interested in using ChatGPT, allowing them to share their experiences, strategies, and resources. Through regular meetings, workshops, webinars and online platforms, educators can engage in discussions, collaborate on innovative ideas, and learn from one another's successes and challenges. The CoP promotes a culture of continuous improvement and provides a supportive network where educators can explore the potential of ChatGPT in higher education.

To ensure a smooth integration process, technical support should be readily available to address any challenges or concerns related to the implementation of ChatGPT. Higher Education institutions should offer technical assistance, troubleshooting guidance, and resources to support educators in effectively utilising the AI model. This support can range from addressing technical issues with the technology to helping educators navigate ethical considerations and privacy concerns. By providing robust technical support, institutions can alleviate concerns and enable educators to integrate ChatGPT into their teaching practices confidently.

Evaluation and research

Evaluation and research are essential when ChatGPT is used in higher education because they provide insights into efficacy, pedagogical considerations, ethical implications, user experience, continuous improvement, and evidence-based decision-making. By conducting thorough evaluations and research, institutions can maximise the benefits of ChatGPT while addressing potential challenges, ensuring responsible use, and fostering a positive impact on teaching and learning. By utilising the proposed framework, practitioners and researchers can have a clear overview of the elements, relationships, and outcomes of embedding ChatGPT in higher education settings.

Applying the framework for assessment design

Using the previous learning design developed by the author and linking it to the framework, three scenarios were redesigned below that cover three different disciplines: science, social sciences and arts. The scenarios presented are individual but can be redesigned to be group based. The purpose of the section is to provide ideas on how to design assessments using ChatGPT. Note that it uses the personalisation principle of multimedia learning, 'you' rather than 'the student.'

Assessment Task 1: Interactive Science Exploration with ChatGPT

This assessment task allows you to actively engage with scientific concepts, critically evaluate responses from ChatGPT, collaborate in problem-solving, and develop digital literacy skills. It encourages you to reflect on the learning experience and apply scientific reasoning to evaluate the reliability and validity of information obtained with ChatGPT. The task promotes active learning, critical thinking, and effective communication in science.

Learning Outcomes:

At the end of this task, you will be able to:

- Demonstrate a comprehensive understanding of scientific concepts and principles.
- Apply critical thinking skills to analyse and evaluate scientific information.
- Engage in collaborative problem-solving and inquiry-based learning.
- Utilise digital literacy skills to access and evaluate scientific resources.
- Communicate scientific ideas effectively through written and verbal communication.

Task Description

You will engage in an interactive science exploration for this assessment task using ChatGPT as a virtual assistant. The task assesses your understanding of scientific concepts, critical thinking skills, collaborative problem-solving abilities, digital literacy, and communication skills.

Instructions

- Access the ChatGPT platform your tutor provides and familiarise yourself with its features and functionalities.
- Choose a scientific topic of interest from the list provided in the classroom.
- Initiate an interactive conversation with ChatGPT to explore and deepen your understanding of the chosen topic.
- Ask questions, seek explanations, and discuss key concepts with ChatGPT. Use critical thinking skills to evaluate the responses provided by ChatGPT, considering their accuracy, relevance, and coherence.
- Engage in collaborative problem-solving by discussing challenging scientific problems or scenarios with ChatGPT. Evaluate the problem-solving strategies suggested by ChatGPT and propose alternative approaches, providing justifications based on scientific reasoning.
- Utilise your digital literacy skills to access additional scientific resources beyond ChatGPT, such as scientific journals, databases, or reputable websites. Compare the information obtained from ChatGPT with these external sources and critically evaluate the reliability and validity of the information.

Based on your interactions with ChatGPT and the additional resources, write a reflective report that addresses the following points:

- Summarise the key scientific concepts and principles discussed.
- Analyse and evaluate the responses provided by ChatGPT, highlighting any strengths, limitations, or potential biases.
- Reflect on the collaborative problem-solving process, discussing the effectiveness of the problem-solving strategies suggested by ChatGPT and proposing alternative approaches.
- Discuss the reliability and validity of the information obtained from ChatGPT compared to the external scientific resources.
- Reflect on the learning experience and how ChatGPT enhanced your understanding of the chosen scientific topic.
- Submit your reflective report according to the guidelines provided by your tutor.

Assessment Criteria

- Demonstrated understanding of scientific concepts and principles.
- Application of critical thinking skills in evaluating responses and problem-solving strategies.
- Collaboration and engagement in interactive conversations with ChatGPT.
- Effective utilisation of digital literacy skills to access and evaluate scientific resources.
- Clear and coherent communication of scientific ideas in the reflective report.

Note: It is essential to adhere to academic integrity principles throughout the assessment task. Properly cite and reference any external sources used in your reflective report.

Assessment Task 2: Analysing Social Issues through Interactive Dialogue with ChatGPT

This assessment task allows you to actively engage with social issues, critically evaluate responses from ChatGPT, engage in collaborative dialogue, and develop digital literacy skills. It encourages you to apply social theory, engage in critical analysis, consider diverse perspectives, and evaluate the reliability of information obtained. The task promotes critical thinking, collaborative dialogue, and effective communication in the social sciences discipline.

Learning Outcomes:

At the end of this task, you will be able to:

- Demonstrate a comprehensive understanding of social theory.
- Apply critical thinking skills to analyse and evaluate social issues.
- Engage in collaborative dialogue to explore diverse perspectives on social issues.
- Utilise digital literacy skills to access and evaluate relevant social science resources.
- Communicate findings and arguments effectively through written and verbal communication.

Task Description

For this assessment task, you will interact with ChatGPT to analyse and explore social issues within social sciences. The task assesses your understanding of social theory, critical thinking skills, collaborative dialogue abilities, digital literacy, and communication skills.

Instructions

- Access the ChatGPT platform your tutor provides and familiarise yourself with its features and functionalities.
- Choose a specific social issue of interest from the list provided in the classroom.
- Initiate an interactive dialogue with ChatGPT, discussing and exploring different aspects of the chosen social issue.
- Engage in critical thinking by questioning and evaluating the responses provided by ChatGPT. Consider the underlying assumptions, biases, and evidence supporting the viewpoints presented by ChatGPT.
- Foster collaborative dialogue by engaging in a back-and-forth conversation with ChatGPT. Present arguments, counterarguments, and alternative perspectives on the social issue, and critically analyse the responses from ChatGPT to identify strengths and weaknesses in its reasoning.
- Utilise your digital literacy skills to access additional social science resources beyond ChatGPT. Incorporate information from reputable sources, such as scholarly articles, reports, or relevant websites, to support or challenge the viewpoints presented by ChatGPT.

Based on your interactions with ChatGPT and the additional resources, write an analytical essay that addresses the following points:

- Introduce the chosen social issue and provide a brief overview of its significance in the field of social sciences.

- Analyse and evaluate the responses and viewpoints presented by ChatGPT, critically examining their coherence, biases, and supporting evidence.
- Reflect on the collaborative dialogue with ChatGPT, discussing the strengths and limitations of the arguments presented and proposing alternative perspectives or counterarguments.
- Incorporate information from external social science resources to support or challenge the viewpoints presented by ChatGPT, analysing the reliability and validity of the information obtained.
- Conclude and provide well-supported arguments regarding the social issue based on your critical analysis and engagement with ChatGPT and external resources.
- Submit your analytical essay according to the guidelines provided by your instructor.

Assessment Criteria:

- Demonstrated understanding of social theory and concepts related to the chosen social issue.
- Application of critical thinking skills in evaluating responses, identifying biases, and analysing evidence.
- Engagement in collaborative dialogue with ChatGPT, presenting well-reasoned arguments and considering alternative perspectives.
- Effective utilisation of digital literacy skills to access and evaluate relevant social science resources.
- Clear and coherent communication of findings and arguments in the analytical essay, supported by evidence.

Note: It is essential to adhere to academic integrity principles throughout the assessment task. Properly cite and reference any external sources used in your analytical essay.

Assessment Task 3: Creative Exploration and Reflection through Interactive Art Dialogue with ChatGPT

This assessment task allows you to actively engage with artistic concepts, critically analyse artworks, engage in reflective dialogue, and develop digital literacy skills. It encourages students to apply artistic principles, explore personal artistic growth, seek guidance, and incorporate diverse artistic inspirations into their creative process. The task promotes critical thinking, interactive dialogue, and effective communication in arts.

Learning Outcomes:

At the end of this task, you will be able to:

- Demonstrate a comprehensive understanding of artistic concepts, techniques, and theories.
- Apply critical thinking skills to analyse and interpret artworks.
- Engage in an interactive dialogue to explore and reflect on artistic processes and outcomes.
- Utilise digital literacy skills to access and evaluate diverse artistic resources.
- Communicate artistic ideas and reflections effectively through written and verbal communication.

Task Description

For this assessment task, you will interact with ChatGPT to explore and reflect on artistic concepts, techniques, and processes within the arts discipline. The task assesses your understanding of artistic principles, critical thinking skills, interactive dialogue abilities, digital literacy, and communication skills.

Instructions:

- Access the ChatGPT platform your tutor provides and familiarise yourself with its features and functionalities.
- Choose a specific art form or artistic concept of interest within the list provided in the classroom.

- Initiate an interactive dialogue with ChatGPT, discussing and exploring different aspects of the chosen art form or concept. Seek explanations, ask for examples, and engage in a back-and-forth conversation to deepen your understanding.
- Apply critical thinking skills to analyse and interpret artworks related to the chosen art form or concept. Discuss your interpretations with ChatGPT, evaluate its responses, and consider alternative perspectives.
- Engage in a reflective dialogue with ChatGPT, sharing your artistic experiences, challenges, and insights. Seek guidance, suggestions, and feedback from ChatGPT to enhance your artistic growth and creative process.
- Utilise your digital literacy skills to access diverse artistic resources beyond ChatGPT. Explore digital galleries, artist portfolios, videos, or articles about the chosen art form or concept. Incorporate insights and inspiration from these resources into your dialogue with ChatGPT.

Based on your interactions with ChatGPT and the additional artistic resources, create a reflective portfolio that includes the following components:

- Provide an overview of the chosen art form or concept and its significance in the arts field.
- Summarise the key points discussed in your interactive dialogue with ChatGPT, including insights gained, interpretations explored, and artistic challenges addressed.
- Reflect on your artistic experiences, growth, and insights, discussing how the dialogue with ChatGPT and external resources influenced your creative process.
- Include examples of your artworks or creative endeavours related to the chosen art form or concept, accompanied by explanations and connections to the insights gained through the dialogue.
- Conclude the reflective portfolio by summarising your overall artistic development, the value of the interactive dialogue with ChatGPT, and future aspirations in your creative journey.
- Submit your reflective portfolio according to the guidelines provided by your tutor.

Assessment Criteria:

Your assessment will be evaluated based on the following criteria:

- Demonstrated understanding of artistic concepts, techniques, and theories related to the chosen art form or concept.
- Application of critical thinking skills in analysing artworks, interpretations, and alternative perspectives.
- Engagement in an interactive dialogue with ChatGPT, exploring and reflecting on artistic processes and insights.
- Effective utilisation of digital literacy skills to access and evaluate diverse artistic resources.
- Clear and coherent communication of artistic ideas, reflections, and examples in the reflective portfolio.

Note: It is essential to adhere to academic integrity principles throughout the assessment task. Properly cite and reference any external sources used in your reflective portfolio.

Discussion

The Model for Embedding ChatGPT in Higher Education offers several advantages in enhancing teaching and learning experiences. Firstly, it promotes student engagement through interactive conversations with ChatGPT, allowing students to ask questions, seek clarifications, and receive personalised feedback. This active participation fosters curiosity and motivation among students. Additionally, ChatGPT provides opportunities for students to develop critical thinking skills by challenging them to articulate their thoughts, evaluate perspectives, and engage in higher-order thinking. The assistance provided by ChatGPT in problem-solving activities further enhances critical thinking abilities.

Another benefit of the model is its ability to offer personalised learning experiences. ChatGPT adapts to students' knowledge levels and learning preferences, providing customised explanations, resources, and examples. This personalised approach supports differentiated instruction and empowers learners

to take control of their learning. Moreover, ChatGPT is a valuable tool for research and inquiry activities, assisting students in literature reviews, formulating research questions, and analysing research findings. Its vast knowledge base and language understanding capabilities enable efficient exploration of complex datasets.

The scenarios showcased three individual assessment tasks guided by the framework presented. These scenarios can be templates for different disciplines to draft assessment tasks that embed ChatGPT using sound educational practices. Although these scenarios were developed for individual assessment types, they can be redesigned and include group work to foster student collaboration, conflict resolution, working with others, and understanding diversity.

Considering the potential limitations and challenges of embedding ChatGPT in higher education is essential. One concern is the likely reliance on ChatGPT as a sole source of information, which may limit students' exposure to diverse perspectives and alternative sources. Educators need practical training and guidance to ensure appropriate integration and management of ChatGPT in the learning process. Additionally, ethical considerations, such as privacy and data security, should be addressed to safeguard student information and maintain responsible AI use in education.

Conclusions

In conclusion, the integration of ChatGPT in higher education holds significant potential for enhancing teaching and learning experiences. By leveraging the capabilities of ChatGPT, educators can promote student engagement, foster critical thinking skills, facilitate personalised learning experiences, and provide research support. The model outlined in this literature review highlights the various applications of ChatGPT in higher education, including interactive conversations, question-answering, feedback provision, and research assistance.

Overall, the incorporation of ChatGPT in higher education has the potential to revolutionise teaching and learning practices. By leveraging its capabilities and addressing the associated challenges, educators can create engaging, personalised, and research-driven learning environments that empower students and enhance their academic journeys.

Given the promising opportunities and considerations discussed, further exploration and implementation of ChatGPT in higher education settings are warranted to unlock its full potential in supporting students' academic growth and educators teaching practices.

The future

The future of ChatGPT in higher education holds immense potential for transformative advancements. The author anticipates even more sophisticated and intelligent chatbot capabilities as technology evolves and improves. These advancements will enable ChatGPT to offer increasingly personalised and tailored learning experiences, catering to individual learners' unique needs and preferences. Integrating natural language processing and machine learning algorithms will enhance ChatGPT's ability to understand and respond to complex student queries and provide targeted feedback. Moreover, as the technology becomes more widely adopted, a rich ecosystem of educational chatbot applications and resources will emerge, enabling educators to leverage pre-trained models and develop specialised educational assistants for specific subjects or domains. Additionally, integrating multimodal features, such as voice recognition and visual content analysis, will further enhance the interactive and immersive nature of ChatGPT, facilitating more engaging and dynamic learning experiences. As AI technology advances and the benefits of ChatGPT become more evident, we can expect to witness its increasing integration into higher education settings, redefining educational practices and how students learn, engage, and collaborate.

Technology proxies were used to produce this manuscript.

I used an iMac and a Windows laptop. I also used Word processor, EndNote, Grammarly, Google Scholar and LearnTechLib.org databases, LinkedIn learning courses, several webinars about AI I attended and ChatGPT to brainstorm preliminary ideas. I also use my brain and 15 years of experience in the educational technology field.

References

Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionising education with AI: Exploring the transformative potential of ChatGPT. Contemporary Educational Technology, 15(3), ep429. https://doi.org/10.30935/cedtech/13152

Baker, A., & Beames, S. (2016). Good CoP: What Makes a Community of Practice Successful? Journal of Learning Design, 9(1), 72-79. https://doi.org/10.5204/jld.v9i1.234

Bašić, Ž., Banovac, A., Kružić, I., & Jerković, I. (2023). Better by You, better than Me? ChatGPT-3 as writing assistance in students' essays. https://doi.org/10.35542/osf.io/n5m7s

Biswas, S. (2023). Role of Chat GPT in Education. Available at SSRN 4369981.

Bitzenbauer, P. (2023). ChatGPT in physics education: A pilot study on easy-to-implement activities. Contemporary Educational Technology, 15(3), ep430. https://doi.org/10.30935/cedtech/13176

Bonk, C. J., & Graham, C. R. (2012). The handbook of blended learning: Global perspectives, local designs: John Wiley & Sons.

Caramori, J. C. T., Abbade, L. P., Weber, S. A. T., Neto, A. A. P., Reis, G., Oliveira, R., & Thabane, L. (2019). Sharing best practices in applications of evidence-based medicine, problem-based learning and self-directed learning principles in medical training: A McMaster-Brazil collaboration workshop report. MedEdPublish, 8. https://doi.org/10.15694/mep.2019.000067.1

Dai, W., Lin, J., Jin, F., Li, T., Tsai, Y.-S., Gasevic, D., & Chen, G. (2023). Can large language models provide feedback to students? A case study on ChatGPT. https://doi.org/10.35542/osf.io/hcgzj

Derner, E., & Batistič, K. (2023). Beyond the Safeguards: Exploring the Security Risks of ChatGPT. arXiv preprint arXiv:2305.08005.

Dowling, M., & Lucey, B. (2023). ChatGPT for (finance) research: The Bananarama conjecture. Finance Research Letters, 53, 103662. https://doi.org/10.1016/j.frl.2023.103662

Firat, M. (2023). How chat GPT can transform autodidactic experiences and open education. Department of Distance Education, Open Education Faculty, Anadolu Unive. https://doi.org/10.31219/osf.io/9ge8m

Herrington, J., & Herrington, A. (1998). Authentic assessment and multimedia: How university students respond to a model of authentic assessment. Higher Education Research & Development, 17(3), 305-322. https://doi.org/10.1080/0729436980170304

Kim, S., Shim, J., & Shim, J. (2023). A Study on the Utilization of OpenAI ChatGPT as a Second Language Learning Tool. Journal of Multimedia Information System, 10(1), 79-88. https://doi.org/10.33851/JMIS.2023.10.1.79

Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. Improving schools, 19(3), 267-277. https://doi.org/10.1177/1365480216659733

Lee, H. (2023). The rise of ChatGPT: Exploring its potential in medical education. Anatomical Sciences Education. https://doi.org/10.1002/ase.2270

Limo, F. A. F., Tiza, D. R. H., Roque, M. M., Herrera, E. E., Murillo, J. P. M., Huallpa, J. J., . . . Carranza, C. P. M. (2023). Personalised tutoring: ChatGPT as a virtual tutor for personalised learning experiences. Social Space, 23(1), 293-312.

Liu, L., & Gibson, D. (2023). Exploring the Use of ChatGPT for Learning and Research: Content Data Analysis and Concerns. Paper presented at the Society for Information Technology & Teacher Education International Conference.

Lodge, J. M., Thompson, K., & Corrin, L. (2023). Mapping out a research agenda for generative artificial intelligence in tertiary education. Australasian Journal of Educational Technology, 39(1), 1-8. https://doi.org/10.14742/ajet.8695

Maciel, L. (2023). ChatGPT and the ethical aspects of artificial intelligence. Revista de Gestão, 30(2), 110-112. https://doi.org/10.1108/REGE-04-2023-207

Magen-Nagar, N., & Shonfeld, M. (2018). The impact of an online collaborative learning program on students' attitude towards technology. Interactive Learning Environments, 26(5), 621-637. https://doi.org/10.1080/10494820.2017.1376336

Martínez, P. S., Rodríguez, E. Q., & Rodríguez-Arroyo, J. A. (2015). Curso híbrido y de aula invertida apoyado en MOOC: experiencia de autoevaluación. Apertura: Revista de Innovación Educativa, 7(1), 1-1.

Matthews, K. E., Cook-Sather, A., Acai, A., Dvorakova, S. L., Felten, P., Marquis, E., & Mercer-Mapstone, L. (2019). Toward theories of partnership praxis: An analysis of interpretive framing in literature on students as partners in teaching and learning. Higher Education Research & Development, 38(2), 280-293. https://doi.org/10.1080/07294360.2018.1530199

Muñoz, S. A. S., Gayoso, G. G., Huambo, A. C., Tapia, R. D. C., Incaluque, J. L., Aguila, O. E. P., . . . Arias-Gonzáles, J. L. (2023). Examining the Impacts of ChatGPT on Student Motivation and Engagement. Social Space, 23(1), 1-27.

Paul, J., Ueno, A., & Dennis, C. (2023). ChatGPT and consumers: benefits, pitfalls and future research Agenda. In: Wiley Online Library. https://doi.org/10.1111/ijcs.12928

Pluta, W. J., Richards, B. F., & Mutnick, A. (2013). PBL and Beyond: Trends in Collaborative Learning. Teaching & Learning in Medicine, 25, S9-S16. https://doi.org/10.1080/10401334.2013.842917

Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. Paper presented at the 2023 IEEE Global Engineering Education Conference (EDUCON). https://doi.org/10.1109/EDUCON54358.2023.10125121

Qureshi, B. (2023). Exploring the use of chatgpt as a tool for learning and assessment in undergraduate computer science curriculum: Opportunities and challenges. arXiv preprint arXiv:2304.11214.

Reyna, J. (2023, July 10-14). The Potential of Artificial Intelligence (AI) and ChatGPT for Teaching, Learning and Research. Paper presented at the EdMedia + Innovate Learning 2023, Vienna, Austria.

Reyna, J., & Meier, P. (2016). Learning to Surf: Explaining the Flipped Classroom (FC) to Science Students Using an Analogy. American Journal of Educational Research, 4(17), 1213-1216. Retrieved from http://www.sciepub.com/journal/education

Rospigliosi, P. a. (2023). Artificial intelligence in teaching and learning: what questions should we ask of ChatGPT? In (Vol. 31, pp. 1-3): Taylor & Francis. https://doi.org/10.1080/10494820.2023.2180191

Rusandi, M. A., Ahman, Saripah, I., Khairun, D. Y., & Mutmainnah. (2023). No worries with ChatGPT: building bridges between artificial intelligence and education with critical thinking soft skills. Journal of Public Health, fdad049. https://doi.org/10.1093/pubmed/fdad049

Schildkamp, K., van der Kleij, F. M., Heitink, M. C., Kippers, W. B., & Veldkamp, B. P. (2020). Formative assessment: A systematic review of critical teacher prerequisites for classroom practice. International Journal of Educational Research, 103, 101602. https://doi.org/10.1016/j.ijer.2020.101602

Stigmar, M. (2016). Peer-to-peer teaching in higher education: A critical literature review. Mentoring & Tutoring: partnership in learning, 24(2), 124-136. https://doi.org/10.1080/13611267.2016.1178963

Sun, G. H., & Hoelscher, S. H. (2023). The ChatGPT storm and what faculty can do. Nurse Educator, 48(3), 119-124. https://doi.org/10.1097/NNE.0000000000001390

Tan, J. S., & Chen, W. (2022). Peer feedback to support collaborative knowledge improvement: What kind of feedback feed-forward? Computers & Education, 187, 104467. https://doi.org/10.1016/j.compedu.2022.104467

Temsah, M.-H., Jamal, A., & Al-Tawfiq, J. A. (2023). Reflection with ChatGPT about the excess death after the COVID-19 pandemic. New Microbes and New Infections. https://doi.org/10.1016/j.nmni.2023.101103

Temsah, O., Khan, S. A., Chaiah, Y., Senjab, A., Alhasan, K., Jamal, A., . . . Al-Tawfiq, J. A. (2023). Overview of early ChatGPT's presence in medical literature: insights from a hybrid literature review by ChatGPT and human experts. Cureus, 15(4). https://doi.org/10.7759/cureus.37281

Tian, L., & Zhou, Y. (2020). Learner engagement with automated feedback, peer feedback and teacher feedback in an online EFL writing context. System, 91, 102247. https://doi.org/10.1016/j.system.2020.102247

Tsai, Y.-C. (2023). Empowering Learner-Centered Instruction: Integrating ChatGPT Python API and Tinker Learning for Enhanced Creativity and Problem-Solving Skills. arXiv preprint arXiv:2305.00821.

Zhai, X. (2023). Chatgpt for next generation science learning. XRDS: Crossroads, The ACM Magazine for Students, 29(3), 42-46. https://doi.org/10.1145/3589649

Note from the author.

ChatGPT is evolving as quickly as we have never seen before in other digital technologies. Waiting for peer review, changes implementation, proof, and publishing will take a year or more. At that time, there will be several models for embedding ChatGPT in educational settings. As an expert educator, you accept this framework as a guide and use it as you wish. If you want to cite this article, remember it has not been peer-reviewed but has an evidence-based approach with current literature you can revise.

There may be another iteration of the framework, and the manuscript will undergo proofreading for consistency in style and clarity.

Reyna, J. (2023). AI in the Classroom: A Comprehensive Framework for ChatGPT Integration in Teaching and Learning in Higher Education. www.jorge-reyna.com. Published on 12th June 2023.

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