

## Taming the Monster: How can Open Education Promote the Effective and Safe use of Generative AI in Education?

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Keywords	Abstract
Open Education (OE), Open Educational Resources (OER), Open Educational Practices (OEP), Generative AI (GenAI), Large Language Models (LLM), ChatGPT learning, SMS	The development, use, and timely promotion of Open Education (OE) has been effective in addressing myriad educational concerns, including inclusivity, accessibility and learning achievement, among many others. However, limited information exists in the literature concerning how OE could enhance Generative Artificial Intelligence (GenAI), which is receiving extensive interest and criticism at this time. To address this research gap, this study relies on the Open Educational Practices (OEP) framework of Huang et al. (2020) to provide various OEP scenarios that could help to promote and facilitate the effective and safe adoption of GenAI in education. The findings of this study could provide guidelines on how relying on OEP when adopting GenAI could help in ensuring quality education which is the sustainable development goal (SDG 4) of the United Nations (UN).

### Introduction

The term “AI Monsters”, coined by Zipf et al. (2024, p. 284), symbolises the fears that the benefits of Generative Artificial Intelligence (GenAI) could come at too high a cost. These concerns include the potential for misuse of GenAI as well as the potential spread of incorrect information (Zhou et al., 2023), problematic threats to academic integrity (Perkins, 2023), difficulties in verifying the authenticity of student work (Ifelebuegu, 2023), and the inherent risk



of over-relying on AI to replace, rather than to complement or enhance, student learning (Lo et al., 2024).

In the midst of such negative overtures, cautionary notes, and hesitations, educators might look to previous waves in learning technology (Bonk & Wiley, 2020) and find possible strengths and benefits of AI technology. For instance, while there are numerous concerns about quality, maintainability, usability, access, and attitudes with different forms of Open Education (OE), it has been shown to address various educational challenges, including accessibility and inclusiveness (Zhang, Tlili et al., 2020) as well as learning effectiveness (Tlili, Garzón et al., 2023), among many others. Institutions and organisations from all corners of the globe, whether they are in Asia, Latin America, the Middle East, Africa, Europe, the Pacific/Oceania, or the Caribbean, are endorsing, embracing, and utilising some aspect of open education to lead efforts to provide more accessible, maintainable, scalable, and personable educational contents in their rapidly changing nations (Bonk et al., 2015; Zhang, Bonk et al., 2020).

However, when discussing Artificial Intelligence (AI) and Open Education (OE), most of the literature has followed one line of thought, discussing how AI generally and generative AI (GenAI) particularly could enhance OE. For instance, Tlili and Burgos (2022) have discussed how AI could enhance the quality as well as protect the copyrights of Open Educational Resources (OER). The issue of who owns the copyright of AI generated content is contestable in various regions (Cooley alert, 2024). While a WIPO (2024) document indicates lack of clarity, it asserts open-source output for codes generated using GenAI tools. Wiley (2023, para. 8) says that “as far as the US Copyright Office is concerned, output from programs like ChatGPT or Stable Diffusion are not eligible for copyright protection”. However, this is a complicated issue since the field is still evolving and GenAI is creating different forms of content (Fui-Hoon Nah et al., 2023). Therefore, irrespective of copyrightability of GenAI content, it should be safe to release all such materials as OER. Bozkurt (2023) discussed how GenAI could help in synthesising content for OE. In this context, UNESCO has organised an event, Generative AI for Open Education (<https://glhconnect.unesco.org/digital-skills/generative-ai-open-education>) discussing GenAI for Open Education.

Despite concerns raised about the use of GenAI in education, scant information exists, on the other hand, about how OE could enhance AI and GenAI. To address this gap, this study focuses on providing scenarios about how OE could enhance GenAI. Specifically, the present study relies on the Open Educational Practices (OEP) framework of Huang et al. (2020) to provide various OEP scenarios to promote and facilitate the safe and effective use of GenAI in education according to each dimension within the framework. The key lies in embedding OEP into the foundation of how we use GenAI in education.

### **Open Educational Practices**

The rapid advancements in OE have pushed researchers to shift their focus from content-centred approaches (i.e., creation, revising, sharing, etc.) to more practice-centred ones, focusing on fostering collaboration between learners and teachers for creating and sharing knowledge (Cronin, 2017). Furthermore, the quality and innovation of pedagogical approaches and learning design have become crucial (Stracke, 2017). In other words, researchers and educators have shifted their focus from creating and publishing OER to practices that can be implemented using OER for teaching and learning, referred to as Open Educational Practices (OEP) (Schaffert & Geser, 2008). Huang et al. (2020) have conducted a comprehensive review of OEP definitions and concluded that the following four dimensions are within the realm of OEP:

- *OER*: Teaching materials used within OEP should be openly licensed, and the resources produced during the course (e.g., reports, presentations, and videos) should also be released as OER.
- *Open teaching*: Educators should implement teaching methodologies that can help students to construct their own learning pathways (self-regulation) and actively contribute to knowledge building, both individually and collaboratively.
- *Open collaboration*: Teachers should build open communities, for instance, by using social networks, to help students working in teams to carry out particular learning tasks (e.g., editing a blog, creating a Wikipedia page, producing a podcast show, etc.) as well as to exchange ideas and discussions related to those specific learning tasks. Other teachers and stakeholders could participate in these discussions as well as further assist learners.
- *Open assessment*: Teachers should allow learners to evaluate each other (peer assessment). This could emphasise reflective practices and improve learning outcomes.

### **OEP Scenarios for a Safe and Effective GenAI in Education**

This section provides various OEP scenarios that could be implemented to promote and facilitate the safety and effectiveness of GenAI in education. These scenarios are discussed according to each of the framework dimensions, namely OER, open teaching, open collaboration, and open assessment.

#### **OER**

##### ***Bank of Prompts***

Tlili, Shehata et al. (2023a) mentioned that the use of GenAI does not require a lot of technical and ICT (information and communication technologies) competencies, but it requires some question-posing and critical thinking competencies. In this context, it has been shown that the poor results given by some GenAI tools are due to the poor prompts used by students or teachers. Therefore, it is possible to develop quality prompts that could be used as OER, stored in a prompt bank, and re-used in different contexts with an open licence. These prompts could then be re-used by different stakeholders (e.g., teachers, students, etc.) in their contexts. The bank of prompts should be developed as an online platform to ensure its sustainability (Tlili, Nascimbeni et al., 2023), where it could easily be enriched by different experts from various fields and disciplines. Consequently, the bank of prompts could support using GenAI effectively in education as well as serve as a guide for those users interested in how to use GenAI through various prompting templates. Nevertheless, aligning quality assurance procedures is essential, as emphasised by UNESCO, to ensure the validity and robustness of the prompts. For example, allowing users to assign ratings (Wiley et al., 2014) could signal the quality of the prompts to future users and serve as a mechanism for platform administrators to identify low-quality prompts and request revisions when necessary. In addition, the development of open frameworks for writing prompts, and especially for domain specific knowledge, could enhance results from the use of GenAI tools.

##### ***Gen AI Courses***

Several studies highlighted that some stakeholders (e.g., teachers, students, administrators, etc.) still do not know the opportunities that GenAI might bring to education (Kelly et al., 2023). Many, on the other hand, are reluctant to use GenAI due to ethical concerns (Bozkurt, 2024). To address these issues, educators might develop a series of GenAI courses as OER that could raise

the awareness of various stakeholders about the opportunities brought by GenAI in education. Given that understanding the mechanics of something can help in better using it, these courses might also explain in a simple way how GenAI works. Those courses could further address the effective and safe use of GenAI in education, including ethical concerns. Since these courses would be designed as OER, they could be easily adapted to different socio-cultural learning communities in the context of culturally relevant pedagogy. The GenAI courses could be organised as MOOCs (massive open online courses), where interested people from all over the world could join them as quality education for all (Stracke et al., 2023). This would increase their accessibility, hence ensuring the worldwide spread of the potential effects and benefits from such courses. The courses could also allow specific micro-practices or pedagogical patterns that use AI to be placed into existing courses via plug and play, without much modification. While many courses on GenAI are available for free, these are not OER, limiting their ability to be repurposed in different contexts and formats.

### ***Guidelines and Best Practices***

Writing and publishing guidelines, as OER, about how GenAI should be implemented in education, could help to promote and facilitate its safe and effective adoption in education. Additionally, collecting and compiling best and innovative practices in using GenAI in education could help to inspire others accordingly. Under an open licence, these guidelines and best practices could be translated into several languages and continually enriched and revised accordingly; as a result, their widespread use would be ensured. Designing such content as OER could also serve to create a living reference source in the AI world, where developments take place very quickly, so that the content could be rapidly updated. In this context, UNESCO, for instance, has published guidelines as OER on the use of GenAI in education (Holmes & Miao, 2023). These guidelines, in fact, have been published in several languages. Notably, guidelines could be integrated as specific applications of policies, clustered by interest groups such as university teachers (Stracke, Bohr et al., 2024). Policies should become the global strategy about OER and GenAI, which could be implemented through the application of those guidelines and best practices (Universidad Internacional de La Rioja, 2023). Importantly, the Commonwealth of Learning recently released policy guidelines for developing AI policies in post-secondary institutions (Ally & Mishra, 2024), which are now available as OER.

### ***OER Repository for GenAI Articles***

For a better understanding of the global impact of Covid-19 on education systems, the World Health Organization (WHO) built an open resources repository for Covid-19 research (Hu et al., 2020). This repository serves as a central collection for all innovative and current articles on Covid-19 and was made easily accessible to readers without a charge. Additionally, all research articles from reputable publishers were vetted by experts from WHO prior to publication to ensure verified information was communicated to the general public. Similarly, to ensure the safe and responsible use of GenAI in education, an evidence-based OER repository of articles on GenAI could be created to serve as a single source for all innovative and current articles on GenAI. Such an archive could facilitate informed decision-making among educators, policymakers, and learners. Advanced filters could be designed and implemented during searches to flag articles as “reliable”, if they were reviewed by experts, or “unreliable”, if they had not yet undergone scrutiny. This ensures that users can trust the information that they access. A multimodal repository could help readers visualise the number of publications from a specific institution or organisation, set of authors, country or region of the world. Similarly, citation counts and associated visual depictions could indicate influential articles and authors or

collaboration teams as well as popular applied frameworks and models. In general, such a repository could generate various data analytics, which help form a common understanding of GenAI according to findings from the research articles. Also, discussion boards could be created for readers to review and give feedback on articles or special issues. In addition, in this repository, researchers could conceivably publish preprint studies after a certain quality assurance mechanism had been applied. The repository could be further enhanced with a notification system that alerts “subscribed” readers about new articles and significant changes in trends in GenAI.

### ***OER Search Engine for GenAI***

Development of a cross-institutional metasearch engine with a user-friendly interface for OER (Otto, 2021) on GenAI could further promote accessibility of updated information on GenAI. The search engine would make use of machine or deep learning algorithms that personalise resources based on user interactions and preferences. This search engine, which might be structured within the scope of universal design principles and might provide a user experience according to the demands of individuals with special needs, could also enable these individuals to access information more quickly.

### **Open Teaching**

#### ***Introducing Responsible use of GenAI Tools***

Teachers could adopt a facilitative role, guiding students to construct their own learning pathways and actively contribute to knowledge building with GenAI. However, before integrating GenAI into learning activities, it is essential for teachers to provide a comprehensive introduction to its responsible use. For example, Elkhodr et al. (2023) briefed students on the benefits of using GenAI to enhance comprehension and exemplify concepts, while emphasising its role as a tool for self-directed learning rather than merely generating answers. This approach encourages students to engage with GenAI thoughtfully, purposefully, and responsibly.

#### ***AI as Tutor***

GenAI tools, such as ChatGPT, can be used to create both generic and subject specific tutors by presenting authentic and quality content. For instance, Khanmigo (a proprietary, but limited free option) demonstrates that GenAI, in addition to becoming a tutor, can also be a companion for teachers in the class (Khan, 2024). The AI as tutor model presents an approach to learning *with* AI. As an additional example, Contact North in Canada has developed such a tool called AI Tutor Pro (<https://www.aitutorpro.ca/>), which helps any learner to check their knowledge and skill on any topic, and also facilitates learning by asking appropriate questions through a dialogic process. Development of more such tools through active involvement of teachers could provide opportunities for learners to use the GenAI tool as a personal companion tutor to develop mastery learning (Tuomi, 2024).

#### ***Hands-on Learning and Co-creation of the Teaching Process***

To enhance students’ effectiveness of using GenAI in education, teachers should adopt open pedagogy in classrooms, where students are co-creators of the teaching process instead of being passive learners (Zhang, Tlili, Nascimbeni et al., 2020). In this context, teachers can work with students on writing prompts together in classrooms, executing them, and assessing the different outputs accordingly. Javier and Moorhouse (2024) demonstrated that after teachers shared strategies for interacting with GenAI (e.g., creating effective prompts by providing contextual information and assigning roles), students were able to engage more smoothly and generate more relevant responses. Additionally, teachers could compile all the different prompts written with

the students and use them as OER so that other students could refer to them as well as use them in their contexts. The students could also be invited to further enrich these prompts. In this way, students could learn by doing and become more motivated and interested in learning about GenAI since they would be active members of the teaching process. This approach could help students to develop and sharpen their skills in the context of prompt engineering (Bozkurt, 2024a), which is one of the dimensions of AI literacy. Mollick and Mollick (2023) provide seven approaches to using GenAI in the classroom, while Mollick et al. (2024), more specifically, present examples of using GenAI as agents for simulation and providing practice skills for learners.

### ***OER Media Outreach***

In Africa and many developing countries, government and educational institutions have made use of social media platforms, radio, television, and SMS (Short Message Service) to spread awareness of Covid-19 and provide related information to the public using accessible/universal language and multiple/easy formats (Adarkwah, 2021). By leveraging such channels, OER providers/platforms can reach a broader audience, including everyday citizens who may not have the time or inclination to enrol in structured OER courses on GenAI. For example, because of the ubiquitous use of smartphones in accessing social media, producing and sharing of OER can create engaging content that simplifies complex GenAI concepts using social media platforms. People who prefer an auditory learning approach can also learn about the safe and responsible use of GenAI through radio and podcast mediums.

### **Open Collaboration**

#### ***Interdisciplinary Collaboration***

To help advance the effectiveness of GenAI in education, it is crucial to have collaboration among experts from different fields beyond education, including computer science, psychology, design, etc. Such mixed vision and expertise could help in identifying different pitfalls and gaps of GenAI from various perspectives, thereby, promoting its effective adoption and use (Azcárate, 2024). In this context, it is possible, for instance, to organise different events (i.e., workshops, webinars, and conferences), as OEP, where experts from different fields are invited to discuss their research and visions about the use of GenAI in education.

#### ***Open Educational Datasets***

Petrov et al. (2024) highlighted that the effectiveness of GenAI tools is not consistent and may generate unfairness between languages because the training data lacks linguistic diversity. Several studies have also highlighted different biased results of GenAI in education. Therefore, to enhance the use of GenAI generally, and, in education, particularly, it is important to train GenAI tools on diversified data from different contexts, populations, cultures, etc. Sharing open educational data can help to achieve this, hence improving the effectiveness of GenAI tools. This could also help tackle ethical issues of whether large language models (LLMs) are based on the theft of illegally scraped copyrighted data. Future LLMs could be equipped with ethical labels certifying the licensing of their source data to which OER could conceivably contribute.

#### ***Open Wizards and Virtual Assistants***

Open wizards and virtual assistants can help create, implement, and assess tools and contents with step-by-step processes, which are user-friendly to the target user (e.g., teacher). Sometimes, the digital gap between school teachers, university professors, and technological competencies requires the use of tools and apps. These tools must be properly integrated with daily practice. However, that integration becomes the main stopper for a successful and efficient

implementation of that very technology, if the teacher is reluctant to use it. A friendly user experience, with a powerful engine behind it, would boost the penetration of those AI-supported tools within the educational community, and would help increase some educational indicators (e.g., student or teacher performance), in turn. It would also improve the integration of OEP with AI-based supported processes and tools.

### ***Customisable OERGPT***

The heightened concerns about ChatGPT-like generative AI tools are compelling universities to create their own GPT models that they have control over (Coffey, 2024). Construction of a GPT model based on existing OERs could increase the accuracy of responses on specific concepts in education. That is, evidence-based information in particular fields could be integrated into a GPT model to enable it to operate in more directed ways than standard ChatGPT interactions. Such an OERGPT could be further updated based on new knowledge in the specific field. A frequent evaluation of the OERGPT could help monitor the progress and success of the model in identifying areas that need enhancement or refinement based on new knowledge from updated OER. An OERGPT could make use of advanced algorithms to provide personalised learning experiences for learners from diverse backgrounds without any bias and use an academic language that is universal. At the same time, Application Programming Interfaces (APIs) from verified different OER platforms could enhance the functionality of the OERGPT by synchronising learning resources in these platforms for users to access real-time information on topics of interest. Collaborative interfaces in the OERGPT could also promote group learning.

### ***Funded OER Programmes for GenAI***

Grant programmes such as Erasmus+ and MSCA Horizon offer students, practitioners, and industry players an avenue to strengthen their knowledge and skills through internship, collaborative research, and study and training initiatives. International organisations or educational institutions that serve as hosts for OER platforms can provide scholarship opportunities or funding for further research and training on GenAI to promote effective use. Funding could be allocated for specific aspects and topics of discussion on GenAI such as designing a GenAI curriculum, ethics, prompt engineering, and best practices. For instance, MIT Open Learning has a call out for innovation papers and projects on actionable insights at the intersection of Artificial Intelligence and Open Education such as the AI + Open Education Initiative (<https://aiopeneducation.pubpub.org/>). Just like the Erasmus+ and MSCA Horizon programmes that offer opportunities for scholars from different backgrounds, diverse participation can help in the development of OER, policy guidelines, and customised GPT models on GenAI in education. The scholarship programme could further promote learning and also the responsible use of GenAI in diverse sectors, including education.

## **Open Assessment**

### ***Peer Assessment***

In traditional education, learning assessment is usually conducted by teachers. OEP, on the other hand, promotes open assessment, where the learning assessment process could involve more people in addition to the teachers. In this context, it is possible to use peer-assessment, where students can assess and rate each other's prompts as well as the output generated by the GenAI tool for a given prompt. The idea behind this is that peer assessment could foster critical thinking and collaborative work between students, resulting in learning from each other's work and mistakes. For example, Chen and Zhu (2023) demonstrated this approach by having students post their ChatGPT conversation transcripts, along with reflections, on a shared online platform

for peer review. While their students found fact-checking challenging, this activity helped them recognise the importance of careful examination and using multiple sources. Furthermore, a two-way or three-way assessment using two human interlocutors along with any open AI engine might improve the support of critical thinking and reflection processes. That interaction flow will later inform the LLM behind the AI engine, making the next interaction more robust.

### ***Open-Source Development***

To ensure transparent and safe use of GenAI generally and in education particularly, GenAI tools should be developed as open source, where various stakeholders could review the code, enhance it, and adapt it, if need be, to their educational context and needs (Pan & Bonk, 2007). LLaMA, an open-source AI model (<https://llama.meta.com>), could be an example in this context. This could help to reuse such tools in various educational scenarios as well as overcome the black box effect of AI in education that several studies have discussed (Gillani et al., 2023). Such an approach could also greatly contribute to open science endeavours, helping to reduce the information gap, as well as enabling technological progress to proceed with less inequality and inequity in a global context. Additionally, students could be enabled and encouraged to ethically use open-source LLMs that can be hosted institutionally or on local machines and explore alternatives to commercially hosted products. Other efforts in this direction could contribute towards models of AI and data sovereignty and “justice-oriented and community-based AI education” (Moudgalya & Swaminathan, 2024).

### ***Semi-automatic Grading and Review Processes***

GenAI has demonstrated its capabilities in grading and reviewing student work, yet it may not always be accurate or tailored to the specific standards of individual teachers (Guo & Wang, 2024). Nevertheless, by providing calibration examples, the performance of GenAI can be better aligned with human standards (Yancey et al., 2023). In this regard, OEP users (e.g., teachers) can openly be invited to grade assignments to inform GenAI-based virtual assistants, thereby, learning from the practices of real teachers. Students could further engage with open-source tools such as the Scalable Automatic Question Usability Evaluation Toolkit (SAQUET), an open-source tool that leverages the Item-Writing Flaws (IWF) rubric for a comprehensive and automated quality evaluation of MCQs (Moore et al., 2024). This could help to enhance the assessment and grading process of GenAI tools, resulting in more accuracy and less bias. This process could be run for two or three cycles, making a reviewer out of the teacher, who could also validate the process and the outcome before final approval. In doing so, OEP could become a crucial provider for GenAI-supported processes double checked by the practitioners (Loos et al., 2023).

## **Conclusions and Implications**

Education has embraced the concept of "open" in various ways, reflecting a commitment to its essence and true nature. Openness “is multifaceted and can be addressed from a wide range of different angles” (Costello et al., 2019, p. 1) as we have explored here through the discussions of various open or opening possibilities. These possibilities range from sharing entire courses at scale via MOOCs to more granular educational building blocks, such as LLM prompts. The open sharing, curating and distribution of these elements, both large and small, are facilitated by open networks, open practices and mediated by open tools. Central to this is the view of Open Education as a holistic philosophy and approach that integrates several dimensions toward the overarching vision of innovative learning for all.



Following and integrating these open approaches, education using GenAI requires both critical reflections by teachers and students as well as learning about AI in general. Open Education, in this context, enhances teachers' and students' sovereignty and resilience in relation to GenAI, preventing over-reliance on restrictive AI practices or processes. Thus, educators and other stakeholders would not become trapped in commercial and/or government-based EdTech monocultures. Those are normally shaped by pedagogies and products that educators and others cannot identify in the black boxes of the GenAI algorithms and which they have to blindly adopt. Furthermore, openness should not be restricted to just one implementation dimension. Open educational developments must move from instructional design and content authoring, to assessment and collaboration, through teaching and programming as well as competence and community building. Finally, we need to decide and to regulate, with official laws and organisational guidelines, how and to what extent we want to allow the use of GenAI in education (Stracke et al., 2024).

All of this must be reflected in education initiatives worldwide, which emphasise that classrooms and education should be for all and where everyone is an active actor, for which we have provided examples of open peer assessment of AI, co-design with students of pedagogies and content with or for the learning of GenAI. These approaches, grounded in an ethos of openness that fosters curiosity and critical thinking, empower both students and educators. This ethos emerges from open community responses—such as the collaboration exemplified by this article—that transcend institutional and disciplinary boundaries, building on educators' adaptive strategies in response to unforeseeable challenges like the pandemic and the rapid rise of GenAI (Mills et al., 2023).

Openness is an ongoing process, constantly evolving and renewing, as illustrated in the present study. However, the term is always at risk of "open-washing"—where something is labelled as open but is actually rooted in proprietorship, private profit, and restricted access to knowledge. It is essential to remain critical, especially of tech giants and SMEs (small and medium-sized enterprises) that use the open label to lure potential users, and to ensure that open or openness truly reflects accessibility and collaboration. Furthermore, a clear distinction between open and free is compulsory since both are complementary but might be the same, for instance, registered personalisation services at no cost. As AI becomes more integrated into education, our focus should remain on harnessing it to promote inclusion, diversion, and personalisation, and to meet the needs of students, teachers, academic managers, and other members of the educational community (Lee, 2020). Finally, we need to decide about the future of our learning processes: *Do we want to combine education and GenAI with commercial egoism or with social empathy, with ignorance for the weakest or in support of the people?* Only with societal responsibility and innovative and critical pedagogical approaches will we be able to achieve quality education for all, as urgently needed and demanded by the SDG4, for our whole society (Mills et al., 2023).

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