

Educating the Educators on Generative Artificial Intelligence in Higher Education

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Abstract: In the current spring of Artificial Intelligence, the rapid development of Generative AI (GenAI) has initiated vivid discussions in higher education. Opportunities as well as challenges have been identified and to cope with this new situation there is a need for a large-scale teacher professional development. With basic skills about GenAI teachers could use the new technology as an extension of the existing technology enhanced teaching and learning. The aim of this paper is to present and discuss the project FAITH (Frontline Application of AI and Technology-enhanced Learning for Transforming Higher Education). FAITH is a higher education pedagogical development initiative for institutional development for teachers with good fundamental skills in traditional pedagogy. A project with the overall objective of increasing the staff understanding of AI and to develop new competencies in the field of GenAI and technology enhanced learning. The research question that guided this study was: "What are the perceived opportunities, challenges and expectations of involving GenAI in higher education?" The overall research strategy for the FAITH project is design-based research, which involves iterative and cumulative development processes. In the early iteration that this study was a part of has been carried out inspired by Collective Autoethnography where members of the steering group behind the FAITH project, and members of the project team have constituted the main focus group. Data were collected by structured interviews where two GenAI tools also have been interviewed. Findings show that the expectations are high, but that the FAITH ambition of institutional development is depending on teachers' motivation for taking an active part in the project. Another challenge could be that many teachers see GenAI as something that threatens the current course design, and that a general ban of GenAI is the appropriate solution. One of, several identified opportunities, is that a general revision of syllabi and assessment in an adaptation for GenAI enhanced learning would improve the current course design.

Keywords: Teacher professional development, Artificial intelligence in education, AIED, GenAI, Higher education, Transformation of higher education

1. Introduction

Current narratives about AI in education cover the benefits, the challenges, and the need for ethical practices. The suggestions that beneficial AI can handle interpretation of very large data sets and offer personalized learning is noted. However, the high-quality datasets that are the substance of GenAI are labelled by humans and carry ontological assumptions that may or not be shared. (Vuong et al., 2018). To deal with current and emerging AI in education, we must "1) demystify new AI systems; 2) focus more on the mundane technical problems of reliability/accuracy, intrinsic biases, vulnerability to hacking, etc., rather than the threat of the "superintelligent AI," and 3) promote balanced ethical discussion about both the potential benefits and harms of these systems among all stakeholders" (Tung, 2020, p. 4). These issues will shape the content and dialogue for FAITH participants.

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FAITH is a project where the overall objective is to increase the staff understanding of AI and to develop new competencies in the field of GenAI and technology enhanced learning. The main research question to answer in

this study was: "What are the perceived opportunities, challenges and expectations of involving GenAI in higher education?". A fundamental idea in the FAITH project is to explore and analyse the capacity of GenAI tools instead of rejecting them. Some researchers see GenAI chatbots as co-researchers today that can do a wide range of research activities (Zhang et al., 2023; Barany et al., 2024), but in this study chatbots have only been a minor part of the data collection.

2. The FAITH Project

Higher education and technological development have a symbiotic relationship. On one hand, much technological development is a result of research efforts. In turn, these efforts lead to technological applications in society. One such field is digital technologies. This is a field, which, nowadays, is very focused on AI technologies. On the other hand, these technologies are applied in trials that aim to develop higher education operations. For example, in how AI impacts learning and teaching in higher education. This in turn is the focus of applied research, for example in the field of educational science. This paper illustrates this process by discussing a development project called FAITH (Frontline Application of AI and Technology-enhanced Learning for Transforming Higher Education).

FAITH is a professional development project that runs between 2024-2026 and aims to develop institutional teaching development and education programs further. In the project, teachers at the studied university will work and develop its educational operations to adapt it to work and study in a highly communicative, cloud-based, mobile and smart AI-based society. The integration of AI and technology-enhanced learning is a key to achieve this goal. The FAITH project will take advantage of ongoing higher education pedagogical development initiatives within the university; harness the power and benefits of already established models and teams, develop professional knowledge through new higher education pedagogy; and increase staff understanding and competence in AI and technology-enhanced learning (Jaldemark et al., 2024).

In professional development efforts, design-based research is a key methodology which involves iterative and cumulative development processes (e.g., Jaldemark, Lindqvist, & Mozelius, 2019; Jaldemark & Öhman, 2020). FAITH consists of three phases: preparation, implementation and evaluation. The first phase is preparation, which includes detailed planning, forming a steering group, and recruiting key competencies for the group team. The project team consists of AI and technology-enhanced learning experts and program managers. These groups are responsible for the staffing and scheduling of FAITH, including developing a plan for the competence development action. Program managers have a prominent role in the FAITH project team and are responsible for the pedagogical development of their respective programs. In the second phase, the implementation phase, the project team supplies the teachers with AI and technology-enhanced learning skills training, supporting pedagogical development work and dissemination of ideas through seminar activities. The focus is on the impact of AI and technology-enhanced learning on higher education studies, including both AI as content and form. The third phase, the evaluation phase, compiles experiences and conclusions are drawn. This phase also proposes further work and ideas that should be implemented in the coming iterations of the included courses and programmes.

3. Related Research

During the last years there has been a fast development of new tools that build around large language models and GenAI techniques. This started with the release of ChatGPT in late 2022 with a development of various GenAI tools that has created both promising opportunities and serious challenges in higher education (Chan and Hu, 2023; Yeralan and Lee, 2023). Many research studies have reported on the need of updated assessment methods to secure that students submissions are true and original work (Gamage et al., 2023; Luo, 2024). The ongoing AI hype might be a hype followed by a new so called AI winter, but the strong impact on teaching and learning in higher education will remain as a challenge to address (Pons, 2023; Whitham et al., 2023). Several universities have rapidly created draft policies that sometimes contradict each other, while other universities at the same time have kept a low profile and remained silent. As highlighted in the study by Luo (2024), to strict and banning policies could result in anxious students that hesitate to use GenAI tools even for legitimate learning purposes.

Higher education and technological development have for many years had a symbiotic relationship that has created both opportunities and challenges. On one hand, new technologies could be seen as a result of research efforts that has led to technological applications in higher education like the currently strong focus on GenAI technologies. On the other hand, these technologies have also been applied in projects that has aimed to further develop higher education pedagogy and to investigate how new technology might support learning and teaching

in higher education. (Mozelius et al., 2024) As pointed out by many recent studies, there is a strong need today for higher education initiatives on how to involve GenAI in course design and students' learning activities, and for teacher professional development on GenAI (Brandão, and Zagalo, 2024; Meli, Taouki and Pantazatos, 2024; Mozelius, 2024; Mozelius et al., 2024).

4. Method

In the described FAITH project, the overall research strategy is design-based research, which involves iterative and cumulative development processes as described by Hoadley and Campos (2022). This early iteration that this study is a part of was carried out inspired by Collective Autoethnography (CoAE). Authors have followed the six-phase approach outlined by Karalis Noel, Minematsu and Bosca (2023), that involves 1) Preparation, 2) Data collection, 3) Transcription, 4) Interpretation, 5) Thematic consensus, and finally, 6) The narrative production. CoAE is an approach that aligns with the spirit of participatory research, since it involves all participants collectively throughout the entire research process, from the definition of the research question to the writing of the final narrative (Karalis Noel, Minematsu and Bosca, 2023). As in participatory action research all participants in the research team should be part of data collection and data analysis, with a focus on collaboration mutual learning, and co-creation of knowledge (Greenwood and Landevin, 2006; Kindon, Pain and Kesby 2007; Karalis Noel, Minematsu and Bosca, 2023).

The members of the FAITH steering group and members of the project team have constituted the main focus group, as well as the author team. In the first preparation phase, authors discussed the study design, the research question and how to collaborate. The two following phases were carried out collaboratively with data collection by structured interviews where members of the focus group and two GenAI tools have been interviewed. To use chatbots in research is not a new concept, and was tested by Shawar and Atwell (2007), many years before the appearance of GenAI bots. Today, researchers such as Barany et al. (2024) consider chatbots to be both tools and co-researcher, and as stated by Zhang et al. (2023) chatbots could act as co-researchers and assist, challenge, or supplement the human researchers. In this study the chatbots have only had a minor role in the data collection, and all the important analysis and synthesis were done by the authors. The two used GenAI tools were ChatGPT and Gemini, that were asked the same questions as the human members of the focus group about the FAITH project. In the fourth phase of review and naming themes, all interview answers were thematically analysed by 2 focus group members according to the process defined by Braun and Clarke (2019). This was followed up in the fifth phase by discussions among all focus group members to reach a thematic consensus before the final collaborative narration production.

5. Findings and Discussions

In a deductive thematic analysis, the answers have been grouped into the predefined categories of 'Expectations', 'Challenges' and 'Opportunities'. These categories are presented and discussed one by one here below with a division between human answers and GenAI chatbot answers. Humans are referred to as Informant 1-5, and the GenAI tools as Chatbot 1 (ChatGPT 4) and Chatbot 2 (Gemini Basic).

5.1 Expectations

Both humans and chatbots show a general positive attitude toward the FAITH project where the human informants have the more detailed information. Chatbots only had the project description that can be found before the method chapter as input.

Human informants

Informant 1 wrote that "I have very high expectations for the FAITH-project", and that the Department of Education needs to be in the forefront in the AI field. As for many other departments it is both about supporting students, and to support teachers design of AI-based teaching and learning activities. If thoughtfully implemented, this could be "a collective knowledge boost for the whole institution" (Informant 3), and that it also could be seen as "a valuable extension to the previous work on higher education reform and lifelong learning completed by this research team" (Informant 2). The same informant, who might be the one with the highest expectations, also foresees a future with increased "professional knowledge through new higher education pedagogies" at the institutional level. In combination with the micro-level individual learning that will provide an "increased staff understanding and competence in AI and technology-enhanced learning".

Moreover, there are expectations of a research part of the project where Informant 4 describes the project as an interesting "case study of AI applications in higher education", where it will be possible to "observe students

and teachers' applications of AI and how it impacts their learning and higher educational setting". All informants mention the internal knowledge sharing, while Informant 3 also brings up that "The results we achieve locally should be discussed internationally in an exchange of 'lessons learned' and 'best practices'". In the answer from Informant 5 there are expectations about beneficial outcomes in at least the three areas of: "1) discovering relevant applications or practices that can be taught to our students, 2) discovering relevant applications or practices that can assist in their own teaching, and 3) discovering relevant applications of GenAI that become helpful in their personal administration, preparation, and planning".

GenAI Chatbots

Chatbot 1 is as optimistic as the humans with high expectations in the areas of 1) Enhanced Educational Operations, 2) Professional Development, 3) Leveraging Existing Initiatives, 4) Iterative Development, and 5) Phased Implementation. Iterative development is built on the use of design-based research methodology in the project description, where iterative development is a corner stone in design-based research projects that Chatbot 1 also mentions that "the project expects to engage in iterative and cumulative development processes to refine and enhance educational practices continuously". Which is exactly according to the project plan, and the same for the elaboration of Phased implementation: "The project is expected to follow a structured approach with clear phases (preparation, implementation, and evaluation) to ensure systematic development and assessment of the project's impact on higher education".

While Chatbot 1 reformulates and adds information about expectations, Chatbot 2 gives more of a summary referring to the references in the given project description:

5.2 Expectations

- Develop institutional teaching development and education programs further (Jaldemark et al., 2024)
- Adapt the university's educational operations to a highly communicative, cloud-based, mobile and smart AI-based society (Jaldemark et al., 2024)
- Increase staff understanding and competence in AI and technology-enhanced learning (Jaldemark et al., 2024)

Complemented with the positive, but very general "The FAITH project has the potential to significantly improve the quality of education at the studied university by developing new teaching methods and technologies".

5.3 Challenges

With the overall high expectations in the previous section, it is important to look at if there are any perceived challenges that could hamper the project implementation. What was an interesting finding is how the answers from the chatbots converge with the human concerns regarding the challenges of "Ethical Considerations" (Chatbot 1) and "Encouraging faculty participation and adoption of new methods" (Chatbot 2).

Human Informants

In human words the challenge of involving all stakeholders was expressed as to "involve all project members so that they participate fully" (Informant 3) and to "create communication and development plans for the FAITH team members and key stakeholders to ensure project momentum and support" (Informant 3). Regarding what the chatbots mention as "resource allocation" Informant 1 is worried about "that this project will take place at the same time as ordinary work with teaching and research. It might be difficult for teacher and researchers to prioritize the project. This could be due to time and possibility to meet in work groups".

Informant 5 points out the issue with that it is a moving target where "GenAI technology evolves rapidly, which could make it difficult to keep up with the latest when planning and preparing content", and an immature field where "There are still lots of juridical blind spots and grey areas that could prove difficult to navigate. For instance, the EU GDPR regulation could hinder the implementation of compulsory GenAI-based course tasks, as students can't be forced to volunteer personal data associated with their user account". Informant 5 highlights the complexity of the topic compared to earlier technology enhanced learning projects since "AI have the potential to deeply impact society. Compared to video conferencing, AI is more similar to the implementation of Internet in educational settings. AI cannot as part of our teaching only be a privilege to a certain category of students, they all need to understand its impact on humans and society".

GenAI Chatbots

Both the chatbots list some challenges that are worth considering. Chatbot 1 gave the more elaborated warning with: 'Change Management' explained as the challenge of "Managing resistance to change among faculty and staff who may be sceptical or hesitant to adopt new technologies and teaching methodologies", and 'Technical Expertise' consisting of "Recruiting and retaining experts in AI and technology-enhanced learning who can effectively train and support the teaching staff". Chatbot 2 had a more parsimonious answer with the brief listing of:

- Integrating AI and technology-enhanced learning effectively
- Encouraging faculty participation and adoption of new methods
- Evaluating the impact of AI on learning outcomes

5.4 Opportunities

There were clearly more opportunities in the informants' answers than challenges, which the authors find to be a good sign in the inception phase of a long-term project.

Human informants

Informant 1 mentions opportunities with the FAITH project such as "It places the department in the forefront at the university in taking on the issue of AI", and that "It will provide teacher the opportunity to gain new knowledge in how to integrate AI in their teaching". This resembles the answer from Informant 4 who thinks that the "Opportunities with an intervention project like FAITH is to raise the bar regarding higher education teachers expected knowledge level about AI in education". Informant 2 claims that a thorough implementation of the FAITH project would meet the need of "The need for higher education pedagogical development is both a requirement and a side benefit of examining the challenges and benefits of AI in education, and that "The training of behavioural scientists, teachers, and educators with high digital competence allows for making informed choices".

Informant 5 brings up the more detailed opportunities of "using GenAI agents to train students in qualitative interview techniques", and that "GenAI could turn out to be helpful in handling everyday teaching tasks, such as feedback support". Moreover, teacher could get help with time-consuming tasks such as subtitling recorded lectures for accessibility, and that researchers can use GenAI tools for transcribing recorded interviews (Informant 5). On a more general level Informant 3 points out "That everyone involved in the project will feel more comfortable using different GenAI tools in the future", and "That critical thinking about AIED is strengthened, and that a common exchange of knowledge and skills in the style of a 'Community of Practice' also leads to new insights into teaching, didactics and course design".

GenAI chatbots

As for the other categories earlier, the chatbot summarises some of the more general ideas that humans have brought up. Chatbot 2 have very general formulations such as that the FAITH project could "Improve the quality and effectiveness of higher education", while Chatbot 1 is a bit more specific in "Providing teachers with AI and technology-enhanced learning skills can lead to significant professional growth and open up new career opportunities". Chatbot 2 also mentions the opportunity of preparing students for their future work life, and that Chatbot 1 highlights the opportunity of that "The integration of AI can lead to the development of innovative teaching practices that enhance student engagement and learning outcomes". Finally, the opportunity that both chatbots brings up, and the humans have omitted, is the possibility of personalised learning tracks for students.

6. General Discussion

If the current AI spring is a hype or not will be revealed during the coming year. At the time of writing the share prices are falling for tech companies such as Nvidia, an example of a company that is heavily depending on GenAI. Several experts have also highlighted the more general economic bubble that could burst in the field of AI. However, independent of the financial development in the near future the challenge for the educational sector will remain with several important questions to address. Some examples here are:

- To what degree, and when should students be allowed to use GenAI in their studies?
- How could teachers redesign their courses to involve AI tools in a constructive way?
- How should the evaluation of the impact of AI on learning outcomes be carried out?
- In what ways must assignments be redesigned to keep fairness and quality learning?

Questions that also could act as a catalyst for the redesign of higher education that with or without AI has to be done. The emerging trend of a would certainly initiate a shift from assessing the product to assessing the process where oral examination can have a renaissance. Moreover, with the idea from computer chess, that man and machine is stronger than just one of them (Kasparov, 2007), the current learning activities could be reinforced and involve an AI boosted creativity. Even if the current AI hype would fail, and whatever teachers' and researchers' opinions on GenAI, higher education needs to address the questions listed above. Authors recommendation is broad professional development initiatives with the aim of AIED with a human touch. Five other priorities that will be presented in one of the first FAITH workshops are the ones outlined by Van Dis et al. (2023): 1) To hold on to human verification, 2) How to develop rules for accountability, 3) Investing in truly open LLMs, 4) Embrace the benefits of AI, and 5) To widen the debate.

7. Conclusion

The conclusion is that the expectations are very high, and maybe too high, and that there are more opportunities mentioned than challenges. The authors see this as a good sign, since a project without optimism in the inception phase would raise a lot of question marks. On the other hand, the found challenges will be the most important input to the FAITH project, with a common list of pitfalls to avoid. These pitfalls, are however, common pitfalls in many projects in academia. Time and resources are traditional challenges in context. At the same time, it appears that the optimistic view, will strengthen and uphold the FAITH-project over time. This paper contributes with ideas for a nuanced and realistic implementation of lifelong learning initiatives and teacher professional development courses. Important to analyse and discuss the opportunities and challenges in the current AI hype to avoid the pitfalls with a superficial instructional design. Finally, this paper describes the importance of a continuous lifelong learning in a digital era with rapidly emerging new technology.

Finally, in the third spring of AI in general and GenAI in particular it is hard to foresee how the different AI techniques depicted in figure 1 will develop in the near future. Independent of how the AI hype cycle develops in general, AI will have a substantial role in education and as described in Pons (2023), the current AI hype should hopefully lead to realistic improvements in teaching and learning.

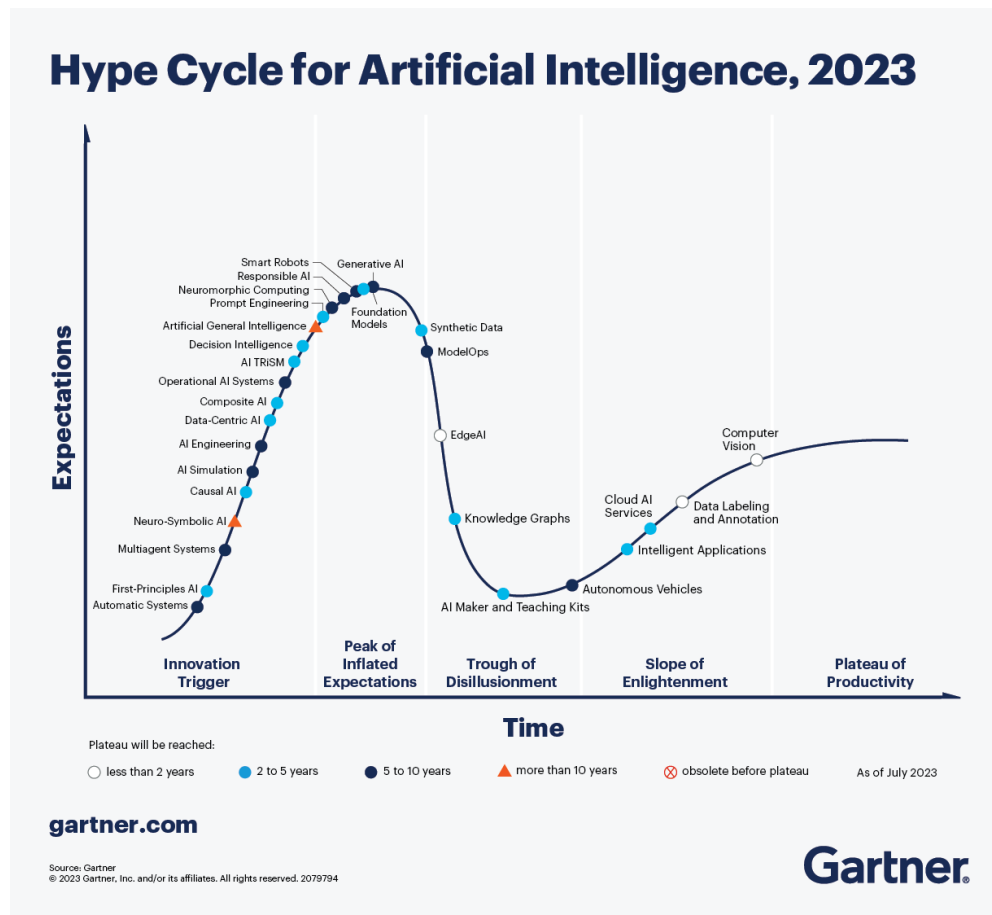


Figure 1: The Gartner Hype Cycle for Artificial Intelligence (Gartner.com, 2024)

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