education sciences

MDPI

Article

Navigating the Evolving Landscape of Teaching and Learning: University Faculty and Staff Perceptions of the Artificial Intelligence-Altered Terrain

Veera Kallunki *, Päivi Kinnunen, Eeva Pyörälä, Anne Haarala-Muhonen, Nina Katajavuori and Liisa Myyry

Center for University Teaching and Learning (HYPE), Faculty of Educational Sciences, University of Helsinki, 00014 Helsinki, Finland; paivi.kinnunen@helsinki.fi (P.K.); eeva.pyorala@helsinki.fi (E.P.); anne.haarala-muhonen@helsinki.fi (A.H.-M.); nina.katajavuori@helsinki.fi (N.K.); liisa.myyry@helsinki.fi (L.M.)
* Correspondence: veera.kallunki@helsinki.fi

Abstract: This study examines the perspectives of university faculty and staff regarding the influence of artificial intelligence on the higher education teaching and learning landscape following the global launch of free-to-use OpenAI ChatGPT in the autumn of 2022. The participants were 79 university faculty and staff from diverse academic fields across all campuses of a multidisciplinary university in Finland. The data were collected in two phases in May–June 2023 and in March 2024, with focus group interviews and Learning Café discussions. The results showed that AI has a broad impact on teaching and studying in higher education. Six main categories were identified: (1) the impact of AI on students' learning processes, (2) the impact of AI on teaching, (3) the knowledge required of future employees and the impact of AI on them, (4) ethical and economic issues, (5) the development of AI or its use in the future, and (6) the nature of the change brought about by artificial intelligence. AI is already making inroads into higher education, and participants underscored its dual impact on teaching and learning, highlighting both opportunities and challenges. While teachers recognized AI's potential to enhance teaching and assessment methods, they also acknowledged the need to adapt their courses accordingly. They expressed concerns about understanding AI's impact on students' learning processes and their own contributions to learning assignments. The participants emphasized the necessity of providing support and training for teachers to ensure AI is meaningfully and effectively integrated into teaching and learning practices and landscapes.

Keywords: university faculty and staff; teaching and learning landscape; artificial intelligence; opportunities and challenges

check for updates

Citation: Kallunki, V.; Kinnunen, P.; Pyörälä, E.; Haarala-Muhonen, A.; Katajavuori, N.; Myyry, L. Navigating the Evolving Landscape of Teaching and Learning: University Faculty and Staff Perceptions of the Artificial Intelligence-Altered Terrain. *Educ. Sci.* **2024**, *14*, 727. https://doi.org/10.3390/educsci14070727

Academic Editor: Robyn M. Gillies

Received: 27 May 2024
Revised: 20 June 2024
Accepted: 1 July 2024
Published: 3 July 2024

Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Recently, scholars have turned their attention to the evolving landscape of education in response to the challenges and opportunities arising from the post-pandemic era [1,2]. Reflecting this trend, for instance, the target university implemented the "Future of Teaching 2035" project during the academic year 2022–2023. The initiative aimed to envision scenarios for the future of teaching and learning through expert workshops and interviews. The project's primary focus was on forecasting how changes in the operational environment would impact higher education. Key questions guiding the project included considerations such as the future of university teaching, the societal standing of universities in 2035, and the characteristics of learners and educators anticipated in the future landscape [3]. However, the concept of an evolving landscape in education is not a new observation; Barnett [4] argued that while universities have traditionally been seen as the primary producers of validated knowledge, the landscape has evolved. He posited that knowledge is produced widely across society, diminishing the pivotal role of universities. Moreover, Barnett characterized the surrounding world of universities by unpredictability and continuous change. Consequently,

he advocated for educational adaptation to equip students with the skills necessary to navigate this supercomplex world [5].

It is essential to understand university teachers' perspectives on the future of teaching and learning. Their vision significantly impacts how higher education possibilities are explored and goals are set [6]. These visions, known as "images of the future," are mental constructs composed of concepts, ideas, scenarios, and narratives held by individuals, groups, organizations, or societies about future possibilities [6]. They shape perceptions of history and current reality and guide actions to shape the future [6,7]. During societal transitions, multiple independent and conflicting images of the future emerge from different interpretations of the times, with each individual or group having its own vision of the future [6,8].

Information technology will be essential in the teaching and learning of the future. Recent years have seen a shift towards digital teaching and learning, a transformation hastened by the 2020 pandemic, which necessitated a swift move to distance learning and diverse pedagogical practices [9–12]. As a continuation of this, the emergence of artificial intelligence (AI) has not only transformed the world but also revolutionized teaching and learning in higher education. During this transition, understanding university teachers' perspectives on the future opportunities and challenges in higher education is crucial for preparing for the forthcoming changes. Foresight efforts concentrate on identifying the essential skills and tasks that will shape future university teaching and learning processes.

Amid accelerating digitization and the rise of artificial intelligence, higher education and assessment are confronting many conflicting factors. In the spirit of futures research, it is crucial to collaboratively build future scenarios with university teachers. This approach ensures that the future landscape of university teaching and assessment is directly shaped by those immersed in educational experience [13,14]. The aim of this study is to explore university faculty and staff's views on the challenges and opportunities in higher education teaching and learning.

2. Artificial Intelligence in Higher Education

Artificial intelligence (AI) refers to the capability of computers to emulate human-like cognitive functions, such as reasoning and learning [15]. AI enables computers to solve complex problems with human-like intelligence and adaptability. Advances in machine learning (ML) have led to the emergence of sophisticated content generators like generative artificial intelligence (GAI), capable of creating various formats of content by analyzing training data. In higher education, the focus has shifted especially to Generative Pre-trained Transformer (GPT) models [15], notably OpenAI ChatGPT, which uses vast amounts of digital content to generate human-like text. ChatGPT, released globally at no charge in November 2022, has sparked debates by showcasing benefits in text creation alongside ethical challenges regarding authorship [16–19]. ChatGPT engages users in a conversational way and can answer users' follow-up questions [20,21]. It generates unique responses to user queries and can create various types of content, including audio, code, images, text, simulations, and videos [22].

The reception of AI applications has been contradictory [23]. Following the launch of ChatGPT, a wide public debate emerged about the benefits and disadvantages of free-to-use AI applications aimed at consumers. In higher education, discussion about the advantages and disadvantages of the tool began in the faculties and educational programs, while the most proactive students quickly adopted ChatGPT as a study tool. Some universities decided to ban its use entirely [24], while others developed guidelines for incorporating AI in teaching and learning [25–27]. Typically, university policies aim at limiting AI use to prevent misuse, while allowing pedagogically useful features that enhance teaching and learning. Students must be informed about the acceptable use of AI in each course and assessment.

In the first two decades of the 21st century, higher education institutions primarily used AI applications for academic support as well as institutional and administrative

services, employing them in a strictly controlled manner for specific purposes [28]. These applications aimed to assist students, faculty members, or administrators through profiling and prediction, intelligent tutoring systems, assessment and evaluation, as well as adaptive systems and personalization. AI also helped manage the assessment of an increasing number of students in mass courses. However, there was a recognized need for critical reflection on the pedagogical and ethical implications of AI in higher education, as well as a consideration of the associated risks [28].

Using digital technology and AI in teaching can enhance educational effectiveness but also poses risks related to inequality, privacy, and bias in student profiling [29]. Teachers often find integrating new technology challenging [30]. However, Kramm and McKenna [31] argue that if higher education aims to transform students through knowledge, academics should explore how AI can facilitate this transformation, such as through innovative assessment methods. While ChatGPT's potential as a pedagogical tool has been acknowledged, for instance, in designing assignments or providing feedback based on assessment criteria [24,32], concerns have also been raised about the risks of students' academic misconduct or cheating [24,32]. Artificial intelligence is already used in teaching and in support of assessments in different disciplines, but opinions on opportunities and challenges vary by discipline. The effects of AI on language learning are of concern to researchers [33], but in nuclear medicine education, for example, research has been conducted on the types of tasks in which ChatGPT is most useful [24].

New educational technologies, especially AI, present significant challenges to higher education teachers, requiring increasingly advanced digital competencies [9]. Research on teachers' digital competence has often sought to understand what knowledge and skills teachers should acquire [30]. Building on Shulman's work on pedagogical content knowledge [34], Mishra and Koehler [35] introduced a Technological Pedagogical Content Knowledge (TPACK) framework, which integrated digital technological knowledge with pedagogical and content knowledge. Content knowledge (CK) encompasses domain-specific knowledge of key facts and concepts of the subject and an understanding of how it is structured. Pedagogical knowledge (PK) involves knowledge about teaching and creating learning environments that support student learning. Technological knowledge (TK) refers to the ability to use different technologies effectively. The intersections of these various knowledge types form three additional knowledge types: pedagogical content knowledge (PCK, knowledge of how to teach a specific content), technological pedagogical knowledge (TPK, knowledge of pedagogical affordance of technology), and technological content knowledge (TCK, knowledge in which ways technology and content influence each other). The more versatile teachers are in their awareness of the complex interactions between knowledge types, the more effective their teaching with digital tools becomes. This allows pedagogical methods to make use of technologies to teach content constructively [30].

There is limited knowledge about how university faculty and staff foresee the future of teaching and learning in higher education. Some evidence suggests that teaching experience influences beliefs about teaching [9,36] and confidence in using technology [37,38]. Thus, it is plausible that teaching experience impacts teachers' views of the future landscape in higher education. Staff in educational services, who support teachers in using educational technology, may have a diverse perspective on how technology will change teaching and learning. In turn, directors of degree programs, responsible for the overall quality of their programs, might have a broader view of teaching and learning.

Another way to examine university staff and faculty members' approaches to new ideas and innovations, including new technology, is through the theory of diffusion of innovation (DOI) [39,40]. This theory helps understand the adoption of innovations at the community or group level. The theory divides people into five groups based on how quickly they adopt a new innovation in comparison with other people in the same community. The first group is innovators who develop new technologies. Typically, only a very small number (2–3%) of people in a community are innovators. Innovators are followed by early adopters who are among the first ones to try out new innovations. Next

come the two large groups of the early and late majority, each making up over one-third of the population. The last group who adopts the innovation are laggards. This last group of people wait until the innovation becomes mainstream before adopting them. In a university context, we can see staff and faculty members forming a community where some adopt technological innovations earlier than others. In some cases, the work description of a person also heavily influences the way individuals see the innovations. For instance, people who are working in education technology support units are likely to be innovators or early adopters of technology. Education technology experts are often responsible for selecting new learning technologies to be used in the institution or are responsible for creating the support systems for end-users.

The overarching aim of this study is to explore the perspectives of university faculty and staff regarding the influence of artificial intelligence on the higher education teaching and learning landscape, following the global launch of the widely used ChatGPT in the autumn of 2022.

This study seeks to address the following research questions:

RQ1: What aspects of AI are discussed among university faculty and staff members?
RQ2: What challenges and opportunities related to AI do university faculty and staff recognize?

3. Materials and Methods

3.1. Context

This study was carried out at a large multidisciplinary, research-intensive university in Anon country, with approximately 4000 teachers and researchers and 35,000 students in eleven faculties. ChatGPT, released at the end of November in 2022, quickly reached hundreds of millions of users worldwide and also became a topic of discussion in the higher education context.

3.2. Data Collection and Procedure

This research is based on two datasets (Figure 1): Data 1 was collected in May–June 2023, when the university had just realized the arrival of artificial intelligence, and Data 2 and 3 were collected in connection with two artificial intelligence seminars held at the university in March 2024.

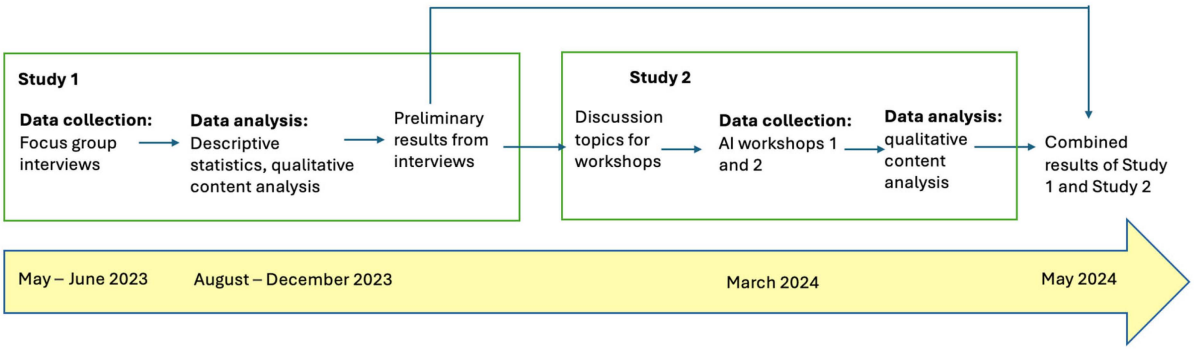

Figure 1. Timeline of the empirical study.

Data 1 consists of purposively sampled interview data collected in May and June 2023. Respondents were deliberately selected based on their demonstrated interest in the advancement of teaching and learning, as they were likely to offer valuable insights into the research questions. The interviews were conducted as focus group interviews, with each session involving two to four participants and lasting around 60 min. Participants filled in a short background information form, which surveyed their teaching experience and pedagogical training and their consent for using their responses in the research. The interview questions concerned the opportunities and challenges of the future of teaching

and learning (Appendix A). There were always two researchers present in the focus group interviews. One researcher led the discussion and the other one observed and added follow-up questions if needed.

There were altogether seven focus group interviews in Data 1, comprising a total of 21 university teaching staff members or educational technology experts. The groups were organized as follows: three groups of experienced teachers (9 participants), two groups of young teachers (5 participants), one group of directors of degree programs (3 participants), and one group of educational technology experts (4 participants). The young teachers had 4–10 years of teaching experience, while all the other groups had accumulated 11–20 years of teaching experience. Educational technology experts had the most pedagogical training, having completed an average of the full 60 ECTS (European Credit Transfer and Accumulation System) study credits in university pedagogy. The other groups had 25–59 ECTS of pedagogical training. The participants represented faculties of arts, educational sciences, law, medicine, veterinary medicine, social sciences, science, and theology, as well as educational technology services, which are part of the teaching and learning services unit. Education technology experts were invited because they are often among the first to become aware of new innovations related to the learning environment. Directors of degree programs were included because their responsibilities involve monitoring and developing the quality of teaching, which requires them to consider long-term processes and future trends in education. In addition, we invited teachers at different career stages to capture a broad range of perspectives from the teaching faculty. The interviews explored participants' perceptions of the future of teaching and the assessment of teaching at the university. Although artificial intelligence was not mentioned in the questions, it emerged in every focus group discussion.

We gathered additional data (referred to as Data 2 and Data 3) in March 2024 from university faculty and staff members to deepen our understanding of the focus group results pertaining to AI-related topics. We gathered Data 2 and Data 3 through workshops that we organized in conjunction with an AI seminar at the university during March 2024. We collected Data 2 during an AI-themed event for university staff and faculty members, primarily comprising teaching faculty. Similarly, Data 3 was obtained from a comparable AI-themed event aimed at staff members from teaching and learning services. Both Data 2 and Data 3 were acquired through convenience sampling during the workshops, which were structured as Learning Cafés (Learning Café is a collaborative method for discussion and sharing ideas. People are divided into small groups and each group is introduced to a discussion topic. The groups discuss the topic for 15–20 min and summarize their thoughts on post its or some online platform that everyone in the room can access. After the 20 min, the groups leave their notes on the topic on the table and move on the next table to discuss another topic. The Learning Café method enables the participants to discuss several topics during the session and build on each other's thoughts), wherein small groups engaged in discussions on AI in higher education. Workshop participants completed background information forms, which included inquiries about teaching experience and pedagogical training, along with providing consent for the use of their responses in the research. Only the notes from participants who consented to participate were utilized in this study. A total of 58 faculty and staff gave their consent to use their Learning Café notes as research data. In Data 2, the median teaching experience was 4–10 years, but 27% of the respondents had no pedagogical training, and the median was 11–25 ECTS. In Data 3, the median of teaching experience was 0–3 years, but 44% of the respondents did not have any pedagogical training, and the median of pedagogical training was 1–10 ECTS.

The discussion topics at the workshop were chosen based on the Data 1 analysis results. The themes most strongly expressed in Data 1 were introduced as discussion topics: (1) the impact of artificial intelligence on studying, (2) the impact of artificial intelligence on teaching, (3) the impact of artificial intelligence on assessment, (4) ethical and economic issues related to artificial intelligence, and (5) the threat and opportunity considerations related to the development of artificial intelligence (Appendix B). The participants of the workshops summarized their thoughts on their discussion topics either on post it notes or

an electronic platform. Typically, these notes were short, one sentence long. For instance, "AI may produce distorted or biased information e.g., on people in other cultures, which is ethically wrong", or a few words long, for instance "[AI] helps with brainstorming, structures thinking".

In these Learning Café small group discussions, the role of the researchers was to introduce the discussion topic for the group and remind the participants to write down their thoughts. In the case that there were more small groups than researchers, some groups discussed independently. The notes from the workshops enriched our existing interview data by adding more perspectives for the five themes found in the interview data. In addition, the workshops gathered thoughts of a larger group of staff and faculty members in the university. Altogether, Data 2 and 3 contain notes from 15 small group discussions on five themes.

3.3. Analysis

In this study, we conducted qualitative content analysis to scrutinize data from transcribed focus group interviews and notes from the workshops, integrating insights from multiple sources [41–47]. We employed an inductive and iterative approach to develop the categories through meticulous data analysis. To sustain ongoing involvement with the interviews, we revisited the transcribed raw data while forming and refining categories and provided quotations as evidence for each category (Table 1) [41,43]. We conducted qualitative analysis of the two datasets using ATLAS.ti Windows (Version 23.4.0.29360) [48].

The analysis proceeded as follows: (1) transcription of the focus group interviews, data 1; (2) immersion by two researchers in the entire focus group material; (3) identification of the theme of artificial intelligence as significant, prompting focus on this topic within the research group; (4) coding of descriptions related to artificial intelligence; (5) testing and establishment of initial six categories by two researchers; (6) discussion of categories within the research group; (7) creation of discussion topics for AI workshops; (8) storing the notes from the AI workshops (answers on an electronic platform or as notes on post its) in one document; (9) enriching the existing categories with ideas expressed in AI workshops; (10) after discussing the results as a group, we decided to present the findings from both datasets as complementary sub-studies (Study 1 and Study 2) within this paper. Detailed information on the categories, subcategories, and raw data citations supporting the analysis is in Table 1.

In this study, we took several measures to ensure trustworthiness through the following key criteria: credibility, transferability, dependability, and confirmability [46,49–51]. We established credibility by triangulating two qualitative data types and reaching consensus within the research group. Further, we aimed to strengthen the transferability by providing detailed descriptions of the study's context and participant backgrounds. This enhances relevance to comparable contexts like higher education units. We meticulously documented data collection and analysis procedures to reach dependability. Finally, we aimed to ensure confirmability via transparent documentation of data analysis steps and consensus-seeking discussions within the research group to mitigate bias. Table 1 below gives examples of how we classified some original quotations from our data into the appropriate subcategories and further into the main categories.

Table 1. Classifying original quotations into the appropriate subcategories and further into the categories. Labels in parentheses refer to focus groups 1 to 7 and the ordinal number of the original code. WS refers to notes from the workshops.

Original Quotation	Subcategory	Main Category
But my own kind of philosophy maybe is. . . that in the final stage of your studies you just have to accept the fact that the AI will be part of doing your master's thesis or the like. . . (7:26)	1.1. AI supporting students and learning	1. The impact of AI on students' learning processes
But then, I am worried about those big language models and AI. . . they write an essay in two seconds. How this influences student learning—is the upshot real learning or is it just a really nice text that has been tidied up so that it corresponds to the task that was given. (6:9)	1.2. AI's effect on the quality of learning	
That they are all very simple right now, it is terrible copying. (5:15)	1.3. The essence of learning.	
It is somehow troublesome, as it also elaborates anyway. . . those aims of the teaching. . .as we in a way mechanize things, then of course no need for them <aims> is left anymore. . .what ChatGTP is capable of doing, then it does not make any sense for me to examine, ask a student---(6:13)	2.1. The impact of AI on the content or objectives of education	2. The impact of AI on teaching
. . .add some empirical research to teaching, in that case you must really do. . .what I have already done, too, is that there are not only tasks that are based on literature but also an additional interview in which you have to apply. . . For instance, an interview with a relative (7:31)	2.2. The impact of artificial intelligence on teaching materials, teaching methods, or how teaching is organized	
AI and this ChatGPT and these. . .they are such . . .that we should now learn how to use them. . . that how we create such tasks for assessing learning in which one could use that ChatGPT and still learn and show what you have learnt, although you had utilized some of artificial intelligence. . . (3:16)	2.3. The Impact of AI on learning assessment	
. . .if we for example want that artificial intelligence is utilized in one way or another in learning or in the planning of teaching, so how is our gang going to support it (1:36)	2.4. Support for teachers in the use of AI	
. . .also the needs in working life will change for the knowledge workers in the future. . . what kind of roles are left for human investigators in the future, if the part that is replaced grows larger and larger. . . in my view, perhaps, we'll have more and more help from artificial intelligence. (6:14)		3. The knowledge required of future employees and the impact of AI on them
Who pays for the new tools and tech needed? (WS1)	4.1. Financial challenge	4. AI and ethical and economic issues
Where goes the line between what is considered self-produced material (teaching material and students' text). . . (WS2)	4.2. Ethical challenges for the teacher and the degree program	
. . .they are good students, they are able to use it, because they understand what's the point, so in that case it only makes their job more efficient and it's not a problem. And the poor ones are not able <to use AI> and they get caught. . . (4:3)	4.3. Student-related ethical challenges	
It becomes unclear what is true and what is not (images). (WS2)	4.4. Trustworthiness of the information	
And it is certainly important. . . to see this kind of new things like ChatGPT as an opportunity rather than a threat. At least my first thought was that oh dear, this is going nowhere. But perhaps we should orient ourselves to possible ways of utilizing it, because you are forced to keep abreast of new developments. (3:18)		5. The development of AI or its use in the future
I do think that the biggest challenge of all is related to that artificial intelligence. . . My wild guess is that the next few years will see wild development and then it will perhaps become a bit steadier. It is my guess. And that you somehow manage to keep up to date—"OK, now the artificial intelligence is able to do this and that and that kind of thing could be done this way"—I think that it will be highly challenging for many people. (7:3)		6. The nature of the change brought about by artificial intelligence

4. Results

Based on the analysis of Data 1, we found that although artificial intelligence was not mentioned in the focus group interview questions, the topic emerged spontaneously and strongly in the discussions of all focus groups.

4.1. Results 1, Study 1: Main Categories

The respondents brought up AI when asked what kind of future possibilities or challenges they see for teaching or learning assessment, what should happen to realize the opportunities, and what kind of support teachers would need to face such challenges. The respondents discussed the following aspects of AI (RQ1) that we identified as six main categories relating to the impact of AI on higher education teaching or learning: (1) the impact of AI on students' learning processes, (2) the impact of AI on teaching, (3) the knowledge required of future employees and the impact of AI on them, (4) ethical and economic issues, (5) the development of AI or its use in the future, and (6) the nature of the change brought about by artificial intelligence. Opportunities and challenges of future higher education teaching and learning are discussed through these six categories. Of the main categories, "The impact of AI on teaching" (37%) received the most mentions, which is natural, of course, because most of the respondents were teachers at this point, and the AI discussion was only in the beginning in the spring of 2023. The second largest was the category "The development of AI or its use in the future" (18%). On the other hand, the subcategory related to students, the impact of AI on students' learning processes, also generated a lot of discussion among the respondents (16%) (Table 2, see also Table 1 above).

Table 2. Percentages of the main categories in responses.

Main Category	Percent
1. The impact of AI on students' learning processes	16%
2. The impact of AI on teaching	37%
3. The knowledge required of future employees and the impact of AI on them	9%
4. AI and ethical and economic issues	9%
5. The development of AI or its use in the future	18%
6. The nature of the change brought about by artificial intelligence	11%

We also checked differences between the focus groups in the distribution of the main categories (Table 3). The strongest main category, the impact of AI on teaching (2), led to a lot of discussion in all groups. Young teachers and educational technology experts talked about the themes of all categories (1–6) relatively evenly. In addition to category 2, experienced teachers talked a lot about the impact of AI on students' learning processes (1) and the development of AI or its use in the future (5). All the focus groups except the directors of the degree program talked about all the themes. The knowledge required of future employees and the impact of AI on them (3) and AI and ethical and economic issues (4) were the least mentioned themes.

Table 3. Differences between the focus group in the distributions of the main categories, frequencies of mentions.

	Experienced Teachers, 3 FG, 9 Participants	**Directors of Degree Program, 1 FG, 3 Participants**	**Young Teachers, 2 FG, 5 Participants**	**Educational Technology Experts, 1 FG, 4 Participants**	**Totals**
1. The impact of AI on students' learning processes	**11 (23%)**	-	2 (8%)	5 (14%)	18
2. The impact of AI on teaching	**16 (34%)**	**7 (70%)**	**9 (38%)**	**11 (31%)**	43
3. The knowledge required of future employees and the impact of AI on them	3 (6%)	-	3 (13%)	4 (11%)	10
4. AI and ethical and economic issues	5 (11%)	-	3 (13%)	3 (9%)	11
5. The development of AI or its use in the future	**9 (19%)**	**1 (10%)**	**4 (17%)**	**7 (20%)**	21
6. The nature of the change brought about by artificial intelligence	3 (6%)	2 (20%)	3 (13%)	5 (14%)	13
Totals	47 (100%)	10 (100%)	24 (100%)	35 (100%)	116

Note. FG = focus group.

4.2. Results 2, Study 2: Enriched Categories

Our second research question focused on what challenges and opportunities related to AI faculty and staff recognize (RQ2). To answer this research question, we used all the datasets we had: interview data (Data 1) and the data from the workshops (Data 2 and 3). In the following, we present in more detail the contents of the main and subcategories (Table 1) that have been enriched with Data 2 and 3. The highlights of the results concerning opportunities and challenges are also placed in the TPACK framework (Figure 2) in Section 4.3.

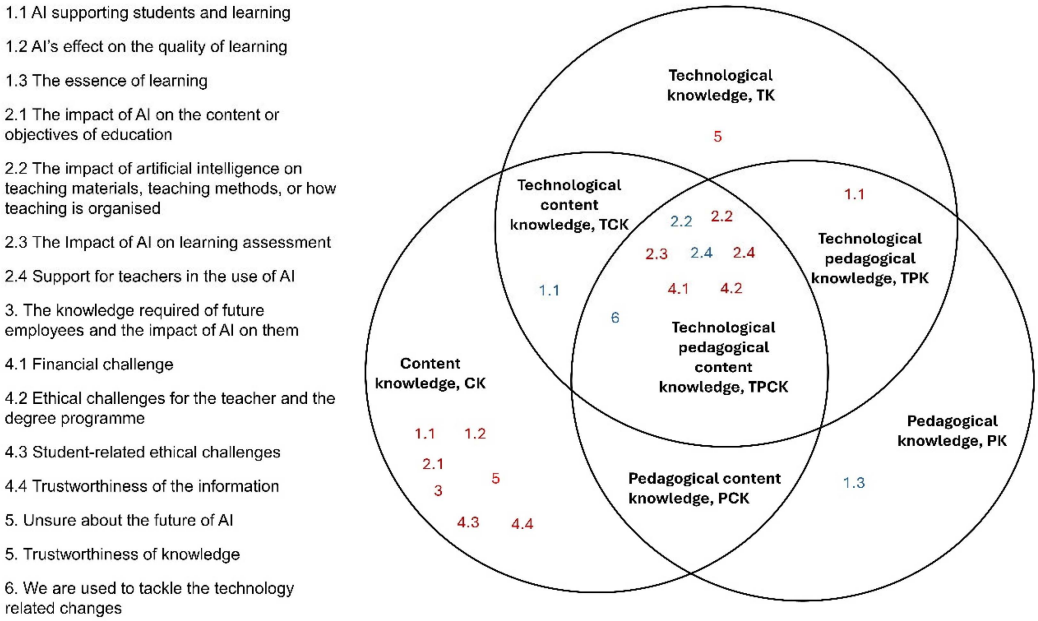

Figure 2. Results seen through the TPCK framework.

The first category, the impact of AI on students' learning processes (1), consisted of three subcategories: *1.1 AI supporting students and learning, 1.2 AI's effect on the quality of learning, and 1.3 The essence of learning*. Subcategory 1.1 AI supporting students and learning highlighted both the challenges and opportunities. The challenges related to the need of sufficient technical support and knowledge of which are relevant AI tools and how to utilize them. In addition, both students and teachers need to be able to critically view the sources of information. The respondents also mentioned several opportunities that AI may offer. These included more abstract suggestions, such as AI facilitating faster and deeper learning, or supporting students' thinking. However, more concrete ideas also emerged from the data: AI supports students' writing process by helping them to get started with writing (getting over the fear of an empty page), AI may help to simulate various situations, AI may help students with disabilities, or AI may act as a discussion partner and thus support learning.

The second subcategory, 1.2 AI's effect on the quality of learning, further emphasized the threats and challenges of AI in learning. This subcategory contained notions on how AI may decay the depth of knowledge that students learn or replace their own thinking. There was also a concern that AI produces new texts that do not contain any new perspectives or insights, or that students would not learn what they should learn during their studies because they do not complete the assignments themselves but instead ask AI to do the work for them. AI makes it possible to externalize the thinking to AI. There were also expressions of fear that the students will not learn how to retrieve information and how to create new knowledge themselves anymore.

The third subcategory, 1.3 The essence of learning, was narrower. The respondents mentioned as an opportunity that perhaps teachers will have more time to focus on the essentials in the future because AI and studying will be more fun. A long, interactive study process will also become important. As a challenge, the respondents questioned whether students would be able to experience moments of realizations themselves anymore.

The second main category, the impact of AI on teaching (2), consisted of four subcategories: 2.1 The impact of AI on the content or objectives of education, 2.2 The impact of artificial intelligence on teaching materials, teaching methods, or how teaching is organized, 2.3 The Impact of AI on learning assessment, and 2.4 Support for teachers in the use of AI. AI challenges the contents and objectives of education (2.1) and brings pressure to develop them. For example, students must be taught the use of AI and AI literacy. The goals of education need to be re-evaluated, because AI could replace some of the work carried out by humans in the future.

AI also challenges the teaching materials and methods used, and more generally, teaching (2.2). Respondents considered that course assignments should be modified so that AI could not produce direct answers. On the other hand, this was seen as requiring more educational resources than before. AI was seen as an opportunity, as it would allow the teacher to create questions, teach programming, make illustrations and other materials, and communicate more easily. In addition, AI would allow teaching to be developed in a more student activating and applied direction, as time is saved for challenging tasks.

AI was perceived as a challenge for the assessment of learning (2.3). Verification of student learning was seen to become more difficult when one can no longer be sure whether AI has produced the student's output. The challenge is to change the focus of assessment to more applied tasks. This would affect the intended learning outcomes, but the courses might then become too demanding. Return to oral examinations was also suggested, but there was fear of their resource-consuming effect. AI also challenges teachers in the sense that a teacher must learn how to use it to perform suitable assessment tasks. The ethical issues of assessment were furthermore seen as a challenge. Artificial intelligence can be used for assessment, but a student's data security or legal security might suffer, and responsibility or transparency become issues. Students need clear limits on the permitted use of AI, and teachers need new ways to identify the text produced by AI. Another challenge was that the usability or use of AI is different in different fields and

countries. It is also challenging to provide the support needed by teachers in a sufficiently clear format (2.4).

Artificial intelligence was also seen as an opportunity for assessment (2.3). It can be used to assess short clear tasks or to provide individual feedback. The teacher could use the saved time for demanding tasks. Respondents further wondered if AI's assessment would be more objective than humans'. In addition, a possibility of increasing the number of students was alluded to if AI could perform some of the assessments.

The third main category described the knowledge required of future employees and the impact of AI on them (3). According to the respondents, AI is both an opportunity and a challenge for the future employee. On the one hand, different AI applications can be used in different ways in future work and as a co-worker, while on the other hand, AI will bring a lot of uncertainty into future working life, because it will replace a human in many tasks and the tasks of a human will change. Presumably, this increases temporary work and puts pressure on the employee to quickly learn new things. The challenge from the university's perspective is also to be able to anticipate what the future working life will require of students studying now, and how the required expertise will change. In addition, the respondents were worried about a possible decrease in the level of expertise due to artificial intelligence.

The fourth main category, AI and ethical and economic issues (4), consisted of four subcategories: 4.1 Financial challenge, 4.2 Ethical challenges of the teacher and the degree program, 4.3 Student-related ethical challenges, and 4.4 Trustworthiness of the information. This was one of the main categories that the data from the workshops (Data 2 and 3) enriched considerably and provided more many-sided points of view of the topic, thus suggesting the need for the four subcategories. The economic challenges (4.1) are related to the chargeability of AI. Who will pay if AI becomes chargeable? There was also a fear that universities will be asked to educate more students with the same resources as before because AI saves time.

In addition, AI was seen to challenge teachers and educational programs in many ways (4.2). Can the use of AI tools be banned in studies when they will be needed in working life? Finally, attention was drawn to the equal treatment of students when it comes to the usage of AI. It was pointed out that strong students may benefit from using AI because they know what they are doing, whereas weaker students may use AI to avoid doing the work themselves (and do not learn).

Both the interviewees and the participants in the workshops identified the need to develop an ethics course for students (4.3). The students' ethical challenges were either related to the use of prohibited AI applications or learning. Good students benefit from the use of AI, but the weak ones get caught up in it. On the other hand, obedient students do not use AI against the rules, but students who ignore the rules do use and obtain better grades. In some disciplines, grades play a role when entering the job market.

The more general challenges posed by AI concerned the nature of AI (4.4). AI generates fake sources whose authenticity is difficult to verify. In addition, the problem is that artificial intelligence has been trained with limited data. The respondents were also concerned for the well-being of teachers and students as the efficiency requirements brought about by AI increase, as well as for the loss of some skills with AI.

The fifth main category, the development of AI or its use in the future (5), consisted of several views on the direction toward which AI will develop and whether this development is seen as an opportunity or a challenge. By far the most often mentioned challenge was related to the various threats that AI may pose to teaching and learning. The challenges related to big social issues like the increase in global inequity (biased information) and trustworthiness of knowledge, and who has access to knowledge. Among the risks brought forward was that teaching will take more time because there is a need to check whether information is true, and the production of learning material will be in the hands of only few actors and nationally produced learning materials will vanish. There were also mentions of the possibility that AI will diminish the need for face-to-face interactions. Finally, there was

a fear that AI might take over altogether. Only generic means to avoid these threats were mentioned, including the need to harness AI needs for good so that it cannot take control.

Even though threats and challenges were discussed a lot, there were also other viewpoints. Some took a more neutral approach and foresaw that the use of AI will become commonplace and the hype around it will diminish. Others were unsure how AI or its use will develop and pondered that the development of AI is dependent on how much money will be used to develop it. There were also some doubts about AI's future. If AI does not develop considerably from its current state, its impact will remain small. Teachers also recognized that the magnitude of AI's impact on teaching and learning is related to whether AI will remain free of charge or not. If it remains free, the magnitude of the impact will be larger.

Teachers pinpointed several opportunities as well. AI could support students learning and inclusivity of studying in many ways, for instance, by helping students with learning disabilities to grasp the essence of longer texts. In general, students may use AI as a virtual tutor and also ask simple questions. AI may act as a motivator for change for teachers and teachers need to "step up their game". Teachers' lack of knowledge of AI may hinder or slow down utilizing the opportunities of AI in teaching.

The last main category was the nature of the change brought about by artificial intelligence (6). There were some discussions and notes on the nature of change relating to AI. First, the change was seen as inevitable and that it will be a big if not one of the biggest challenges of the future. There were some inconclusive thoughts on how fast the change will be. If a lot of money is used to develop AI, the change will be faster. However, it was not clear yet how big the changes that AI will cause will be: whether it will bring as big changes to teaching and learning as COVID-19 with remote teaching or if the changes will be smaller. One positive aspect mentioned was that because of recent big changes due to COVID-19 on teaching, we are now already more used to tackle change. There are some existing procedures that can be reused.

4.3. The Results though TPCK Framework

Finally, we used the Technological Pedagogical Content Knowledge (TPCK) framework [35] to summarize our findings. The framework illustrates different knowledge types teachers need in their work and thus provides one way of organizing our findings. We took a look at the six categories and their subcategories, which are described in detail in Section 4.2. and mapped them into the TPCK framework to see which types of knowledge AI-related discussions activated. In this process, we interpreted the original knowledge types loosely and expanded the framework to cover the TPCK type of thinking to an institutional level too. For instance, the original content knowledge (CK) describes teachers' knowledge of the content that they are teaching. We built on this understanding of CK but expanded it to include also thoughts on the quality of knowledge in general and more broader thoughts on the intended learning outcomes and goals of higher education. Technological pedagogical knowledge, on the other hand, was interpreted as the community of teachers' knowledge about pedagogically meaningful technology (AI).

Looking at Figure 2, we see that AI-related discussions among staff and faculty members have clearly activated especially content knowledge (CK) and the combination of all knowledge types (TPCK). The ideas that were recognized as challenges are marked in red font, and opportunities are written in blue font. The uneven number of challenges and opportunities suggests that staff and faculty members identified more challenges than the opportunities of AI.

5. Discussion

5.1. Findings and Implications

The aim of this study was to explore university faculty and staff's perspectives regarding the influence of artificial intelligence on the higher education teaching and learning landscape following the global launch of free-to-use OpenAI ChatGPT in the autumn of

2022. Although AI was not initially a focus of the study nor even mentioned in the interview questions, it spontaneously emerged in every focus group interview. Respondents raised the topic of AI when discussing future opportunities or challenges for teaching and assessment. The results show that AI has a broad impact on teaching and studying in higher education. Six main categories related to the impact of AI on higher education teaching or learning were identified, with the impact of AI on teaching being the most prevalent. The majority of the effects of artificial intelligence that emerged were seen as challenges for higher education teaching and learning. The use of AI, especially large language models like ChatGPT, was highly relevant during the data collection period due to its recent widespread availability for common use.

The participants discussed the impact of AI on teaching most extensively. They identified several challenges related to the use of AI in education, such as the need to develop and re-evaluate learning objectives, content, materials, teaching methods, and the ethical aspects of assessment. Nevertheless, they also recognized AI's potential to improve and innovate teaching and assessment practices. The focus on challenges in these discussions aligns with previous studies [24,32], which suggest that staff often find technology-based teaching complicated due to the difficulties posed by new technologies [30].

The results revealed contrasting perspectives on the future of AI in education; teachers recognized both its opportunities and challenges. AI was seen as both increasing and decreasing the time teachers spent on teaching. While it was anticipated that teachers would need to spend more time verifying the accuracy of information, it was also believed that AI would free up more time for discussions in teaching, as information could be easily retrieved through AI. These examples illustrate that predictions about the future often contain contradictory elements [6]. Therefore, it is crucial for higher education to support teachers in developing anticipatory and future-oriented skills, and to prepare for the challenges brought about by change [6].

The second largest category, the development of AI or its use in the future, reflected the informants' concerns about the impact of the development of artificial intelligence on teaching and studying. Various challenges of global inequality and changes in teaching were considered. Money was seen to have an impact on the development of AI as well as on the use of teaching and studying; with larger financial investments, AI would develop more in the future, but it should not become chargeable to have a wide impact on teaching and studying. These concerns about inequality can also be found in the OECD Guidelines on Accessibility [29]. On the other hand, AI was seen to be able to support studying in many ways in the future, but it also requires the expertise of teachers, which emphasizes the importance of digital competencies as part of the skills needed by the teachers in their work [9,30].

The impact of AI on students' learning processes emerged as a prominent topic in the discussions. Interviewees discussed challenges related to ensuring students' competence in the relevant and critical use of AI, preventing a decline in mastery of knowledge, and ensuring the quality of learning. These challenges align with previous observations regarding the disadvantages of AI on learning [24,33]. Conversely, possibilities were perceived in AI's potential to facilitate learning and the development of critical thinking skills, which resonates with the assertion by Kramm and McKenna [31] that AI can assist students to build transformative relationship with knowledge.

In addition, themes such as the nature of the change brought about by artificial intelligence, AI and ethical and economic issues, and the knowledge required of future employees and the impact of AI on them emerged in the discussions; among other things, the speed of the change brought about by artificial intelligence, the ethical challenges faced by university teaching and studying (e.g., cheating), as well as the changes in working life and its effects on the skills required of future employees were discussed. Based on the Learning Café discussions, it appeared that ethical and economic issues were discussed more than a year earlier in focus groups. The weight of this perspective is also supported

by the fact that concerns about students' academic misconduct with AI have also surfaced in previous studies [24,32].

Despite the dominance of discussions on AI across all participant groups, we observed variations in both the respondent groups and the focus of their discussions. There was a lot of discussion about the impact of artificial intelligence on teaching in all groups, but there was variation in other themes. Young teachers and educational technology experts talked about the themes of all categories relatively evenly, whereas themes about the impact of AI on study processes and future developments in AI sparked discussion among experienced teachers. The directors of the degree program discussed artificial intelligence surprisingly little. The results partly support previous studies on the impact of educational experience on beliefs about teaching [9,36], as well as confidence in the use of technology [37,38]. On the other hand, young teachers may have acted as early adopters of artificial intelligence [39,40] as it quickly became part of a broad sphere of life. Similarly, educational technology experts have had to face the phenomenon quickly in their work.

The results highlight the fact that, in addition to general guidelines, teachers and students need support and training in the use of AI. Here, not only educational technology experts but also community-based development and sharing of good practices play an important role. In particular, clear guidelines are needed for the assessment of learning, and teachers' assessment skills due to the advent of artificial intelligence must be developed. Artificial intelligence affects curriculum work, as the changing needs of working life, as well as the pressure to develop teaching, learning, and the assessment of learning, among other things, force changes in university teaching. Based on this research, it is possible to continue this research on a solid basis, as the effects of artificial intelligence with its challenges and opportunities have been studied on a broad front from the very beginning.

The message that the results of this study suggest for the upper management of universities is that we cannot afford to neglect the challenges and opportunities of AI in our teaching and learning. The possibility that AI-produced information becomes biased and narrow is a serious challenge not only for the future of learning but also for the future of our society. A profound challenge lies in the quality of learning of our future generation of experts in various fields. Universities should take a proactive role to tackle this challenge.

5.2. Strengths and Limitations

This study on artificial intelligence in higher education, which includes the perspectives of faculty and staff on its challenges and opportunities, is highly relevant. Our data encompassed faculty and staff from diverse academic fields across all campuses of a multidisciplinary university. A notable strength of the study is its two-phase collection of research data, which facilitates a thorough investigation and conceptualization of this evolving topic. Analyzing focus group interviews using content or thematic analysis [52] was particularly apt given these methods' suitability for exploring novel research areas [53] and examining interviewees' understanding and perspectives [52,54]. Additionally, the use of the Learning Cafés provided an innovative approach to gathering research material, offering fresh insights that enhanced and refined perspectives on the transforming subject.

In the focus group interviews, there were consistently two interviewers present. However, the interviewers varied from session to session, potentially impacting the dynamics of the interviews. Nonetheless, the same interview template was employed across all focus group sessions, having undergone a pilot phase before actual data collection commenced.

We took several measures to enhance the trustworthiness of this study [46,49–51]. We used researcher triangulation and cross-comparison of two qualitative data types, meticulously documented the data collection and analysis processes, and tested the preliminary findings within the study group to reach a consensus.

We also acknowledge the limitations of this study. Teaching staff and educational technology experts who actively participated in enhancing teaching and learning were invited to focus group interviews. This selection may have led to more enthusiastic perspectives on new technology and AI compared to the teaching staff as a whole, potentially influencing

the results, i.e., our data were collected from a group of staff and faculty members where innovators and early adopters of new innovations might be overrepresented. Another potential limitation lies in the focus group interviews and Learning Café format. Dominant participants could steer discussions towards topics and emphases that interested them, while the views of quieter, more withdrawn participants may not have been sufficiently represented.

We assessed our collected material to be adequate, reaching saturation. Hennink et al. [55] examined code saturation and meaning saturation in focus group interviews across various data sizes, finding that code saturation could be achieved after four and meaning saturation after five focus group discussions. Our observation of data saturation was consistent with their findings, confirming that conducting five focus group interviews was sufficient.

6. Conclusions

The emergence of AI has profoundly impacted higher education, prompting a need to understand university teachers' perspectives on future opportunities and challenges. Collaboratively building future scenarios with teachers ensures their direct involvement in shaping the educational landscape. This study explored perspectives on AI's influence on teaching and learning following the global launch of ChatGPT in 2022. We delved into aspects of AI discussed among university faculty and staff, as well as the challenges and opportunities they recognized in its implementation.

AI is already making inroads into higher education, and participants underscored its dual impact on teaching and learning, highlighting both opportunities and challenges. While teachers recognized AI's potential to enhance teaching and assessment methods, they also acknowledged the need to adapt their courses accordingly. Faculty and staff members highlighted the fact that AI can be a very useful tool for both teacher and students. On the one hand, teachers can use AI to assess short, simple tasks and therefore the teacher can use the saved time to provide individual feedback to students. On the other hand, students may use AI to support their writing or as a facilitation discussion partner. Faculty and staff members also expressed concerns about understanding AI's impact on students' learning quality and own contributions to learning assignments. In addition, several informants discussed the ethical challenges and possibility of biased information in the future. Finally, there was also uncertainty on what kinds of competencies universities are expected to teach in the future. The participants emphasized the necessity of providing support and training for teachers to ensure that AI is meaningfully and effectively integrated into teaching and learning practices and landscapes.

Author Contributions: Conceptualization, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; methodology, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; validation, V.K., P.K., A.H.-M., N.K. and L.M.; formal analysis, V.K. and P.K.; investigation, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; resources, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; writing—original draft preparation, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; writing—review and editing, V.K., P.K., E.P., A.H.-M., N.K. and L.M.; visualization, P.K.; project administration, V.K., P.K., E.P., A.H.-M., N.K. and L.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study due to local legislation and institutional requirements. The study did not involve elements requiring ethical review (Finnish National Board on Research Integrity, 2019 https://tenk.fi/en/ethical-review, accessed on 2 June 2024).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets presented in this article are not readily available because the data are part of an ongoing study. Requests to access the datasets should be directed to the first author.

Acknowledgments: We thank Jussi-Pekka Järvinen and Tomi Tiittanen for the opportunity to collect data in the workshops they organised, as well as everyone who participated in the focus group interviews and learning cafe discussions. We thank Klaus Helkama for help in language checking.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A. Interview Guide for Focus Group Discussions

Could you please introduce yourself and say what is the best thing about teaching?
What is essential in teaching?
What is essential in assessment of learning?

What future opportunities do you see for university teaching?
What future opportunities do you see for the assessment of learning at the university?
What needs to happen for these opportunities to be realized?

What future challenges do you see for university teaching?
How should teaching change to meet future challenges?
What future challenges do you see for the assessment of learning?

How should assessment change to meet future challenges?
What kind of support is needed to face these challenges?
What challenges does the future pose for the role of the teacher?
What skills should the future (university) teacher have?
What challenges does the future pose for the role of the (university) student?
What skills should the student have in the future?

Appendix B. Instructions for the Learning Café Discussions

Participants were instructed to discuss and write down their thoughts according to the following:
Welcome to this workshop to discuss the impact of artificial intelligence on teaching and learning. During this workshop, you will be able to discuss artificial intelligence-related topics in small groups. You can record your thoughts anonymously on Flinga.

Consent for the research:
May we use the responses you provide during this workshop for the research that we are currently conducting in xx on the future perspectives of teaching and learning? Please kindly complete the short consent form: xxx. If you do not wish to participate in the study, please record your thoughts on Flinga using the green color (others may use any color other than green).

Discussion topics:

1. The impact of artificial intelligence on studying: What opportunities/challenges does artificial intelligence offer to university students?
2. The impact of artificial intelligence on teaching content and teaching methods: What opportunities/challenges does AI offer to university teachers?
3. Artificial intelligence and assessment:
   What opportunities/challenges does artificial intelligence offer to university teachers/students?
4. Ethical and economic issues of artificial intelligence in teaching and studying
5. How will the use of AI in teaching/studying develop in the future?
   (think about a 5-year time span)

References

1. Coleman, K.; Uzhegova, D.; Blaher, B.; Arkoudis, S. *The Educational Turn: Rethinking the Scholarship of Teaching and Learning in Higher Education*; Springer Nature: Singapore, 2023. [CrossRef]
2. Czerniewicz, L.; Cronin, C. *Higher Education for Good: Teaching and Learning Futures*, 1st ed.; Open Book Publishers: Cambridge, UK, 2023. [CrossRef]

3. Future of Teaching 2035′ Scenarios for the Futures of Teaching and Learning. Available online: https://teaching.helsinki.fi/instructions/article/starting-points-teaching#paragraph-7436 (accessed on 16 May 2024).
4. Barnett, R. University Knowledge in an Age of Supercomplexity. *High. Educ.* **2000**, *40*, 409–422. [CrossRef]
5. Barnett, R.; Hallam, S. Teaching for supercomplexity: A pedagogy for higher education. In *Understanding Pedagogy and Its Impact on Learning*; Mortimore, P., Ed.; Paul Chapman: London, UK, 1999; pp. 137–155.
6. Rubin, A. Hidden, inconsistent, and influential: Images of the future in changing times. *Futures* **2013**, *45*, S38–S44. [CrossRef]
7. Demneh, M.; Morgan, D. Destination Identity: Futures Images as Social Identity. *J. Futures Stud.* **2018**, *22*, 51–64. [CrossRef]
8. Rubin, A.; Linturi, H. Transition in the making. The images of the future in education and decision-making. *Futures* **2001**, *33*, 267–305. [CrossRef]
9. Myyry, L.; Kallunki, V.; Katajavuori, N.; Repo, S.; Tuononen, T.; Anttila, H.; Kinnunen, P.; Haarala-Muhonen, A.; Pyörälä, E. COVID-19 Accelerating Academic Teachers' Digital Competence in Distance Teaching. *Front. Educ.* **2022**, *7*, 770094. [CrossRef]
10. Kallunki, V.; Katajavuori, N.; Kinnunen, P.A.; Anttila, H.; Tuononen, T.; Haarala-Muhonen, A.; Pyörälä, E.; Myyry, L. Comparison of voluntary and forced digital leaps in higher education—Teachers' experiences of the added value of using digital tools in teaching and learning. *Educ. Inf. Technol.* **2023**, *28*, 10005–10030. [CrossRef]
11. Turnbull, D.; Chugh, R.; Luck, J. Transitioning to E-Learning during the COVID-19 pandemic: How have Higher Education Institutions responded to the challenge? *Educ. Inf. Technol.* **2021**, *26*, 6401–6419. [CrossRef]
12. Guppy, N.; Verpoorten, D.; Boud, D.; Lin, L.; Tai, J.; Bartolic, S. The post-COVID-19 future of digital learning in higher education: Views from educators, students, and other professionals in six countries. *Br. J. Educ. Technol.* **2022**, *53*, 1750–1765. [CrossRef]
13. Ramos, J. Futureslab: Anticipatory experimentation, social emergence and evolutionary change. *J. Futures Stud.* **2017**, *22*, 107–118.
14. Aalto, H.-K.; Heikkilä, K.; Keski-Pukkila, P.; Mäki, M.; Pöllänen, M. Tulevaisuudentutkimus Tutuksi—Perusteita ja Menetelmiä. Tulevaisuuden Tutkimuskeskus, Turun Yliopisto; Tulevaisuudentutkimuksen Verkostoakatemian Julkaisuja. Turku, Finland. 2022. Available online: https://urn.fi/URN:ISBN:978-952-249-563-1 (accessed on 2 June 2024).
15. Grassini, S. Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. *Educ. Sci.* **2023**, *13*, 692. [CrossRef]
16. Masters, K. Ethical use of Artificial Intelligence in Health Professions Education: AMEE Guide No. 158. *Med. Teach.* **2023**, *5*, 574–584. [CrossRef]
17. Boscardin, C.K.; Gin, B.; Golde, P.B.; Hauer, K.E. ChatGPT and Generative Artificial Intelligence for Medical Education: Potential Impact and Opportunity. *Acad. Med.* **2024**, *99*, 22–27. [CrossRef] [PubMed]
18. Flanagin, A.; Bibbins-Domingo, K.; Berkwits, M.; Christiansen, S.L. Nonhuman "Authors" and Implications for the Integrity of Scientific Publication and Medical Knowledge. *J. Am. Med. Assoc.* **2023**, *329*, 637–639. [CrossRef] [PubMed]
19. Lingard, L. Writing with ChatGPT: An Illustration of its Capacity, Limitations & Implications for Academic Writers. *Perspect. Med. Educ.* **2023**, *12*, 261–270. [CrossRef] [PubMed]
20. OpenAI, Introducing ChatGPT. Available online: https://openai.com/blog/chatgpt (accessed on 15 October 2023).
21. Lock, S. What Is AI Chatbot Phenomenon ChatGPT and Could It Replace Humans? Available online: https://www.theguardian.com/technology/2022/dec/05/what-is-ai-chatbot-phenomenon-chatgpt-and-could-it-replace-humans (accessed on 5 December 2022).
22. McKinsey & Company. What Is Generative AI? Available online: https://tinyurl.com/McKinsey-Generative-AI (accessed on 15 October 2023).
23. Pisica, A.I.; Edu, T.; Zaharia, R.M.; Zaharia, R. Implementing Artificial Intelligence in Higher Education: Pros and Cons from the Perspectives of Academics. *Societies* **2023**, *13*, 118. [CrossRef]
24. Currie, G.; Barry, K. ChatGPT in Nuclear Medicine Education. *J. Nucl. Med. Technol.* **2023**, *51*, 247–254. [CrossRef] [PubMed]
25. UH, Guidelines for the Use of AI in Teaching at the University of Helsinki. Academic Affairs Council. Available online: https://teaching.helsinki.fi/system/files/inline-files/AI_in_teaching_guidelines_University%20of%20Helsinki_0.pdf (accessed on 16 October 2023).
26. UO, Guidelines for the Use of Artificial Intelligence in Education. University of Oulu. Available online: https://www.oulu.fi/en/for-students/studying-university/guidelines-use-artificial-intelligence-education (accessed on 16 October 2023).
27. JYU Using AI-Based Applications for Studies—JYU's Instructions and Guidelines. University of Jyväskylä. Available online: https://www.jyu.fi/en/study/administrative-rules-and-regulations/using-ai-based-applications-for-studies-jyu2019s-instructions-and-guidelines (accessed on 16 May 2024).
28. Zawacki-Richter, O.; Marín, V.I.; Bond, M.; Gouverneur, F. Systematic review of research on artificial intelligence applications in higher education—Where are the educators? *Int. J. Educ. Technol. High. Educ.* **2019**, *16*, 39. [CrossRef]
29. OECD-Education International. *Opportunities, Guidelines and Guardrails on Effective and Equitable Use of AI in Education*; OECD Publishing: Paris, France, 2023.
30. Koehler, M.J.; Mishra, P. What is technological pedagogical content knowledge? *Contemp. Issues Technol. Teach. Educ.* **2009**, *9*, 60–70. [CrossRef]
31. Kramm, N.; McKenna, S. AI amplifies the tough question: What is higher education really for? *Teach. High. Educ.* **2023**, *28*, 2173–2178. [CrossRef]
32. Newell, S.J. Employing the interactive oral to mitigate threats to academic integrity from ChatGPT. *Scholarsh. Teach. Learn. Psychol.* **2023**, *in press*. [CrossRef]

33. Yeo, M.A. Academic integrity in the age of Artificial Intelligence (AI) authoring apps. *TESOL J.* **2023**, *14*, e716. [CrossRef]
34. Shulman, L. Knowledge and teaching: Foundations of the new reform. *Harv. Educ. Rev.* **1987**, *57*, 1–23. [CrossRef]
35. Mishra, P.; Koehler, M.J. Technological pedagogical content knowledge: A framework for integrating technology in teacher knowledge. *Teach. Coll. Rec.* **2006**, *108*, 1017–1054. [CrossRef]
36. Ertmer, P.A.; Ottenbreit-Leftwich, A.T.; Sadik, O.; Sendurur, E.; Sendurur, P. Teacher Beliefs and Technology Integration Practices: A Critical Relationship. *Comput. Educ.* **2012**, *59*, 423–435. [CrossRef]
37. Al-Awidi, H.M.; Alghazo, I.M. The Effect of Student Teaching Experience on Preservice Elementary Teachers' Self-Efficacy Beliefs for Technology Integration in the UAE. *Educ. Technol. Res. Dev.* **2012**, *60*, 923–941. [CrossRef]
38. Han, I.; Shin, W.S.; Ko, Y. The effect of student teaching experience and teacher beliefs on pre-service teachers' self-efficacy and intention to use technology in teaching. *Teach. Teach.* **2017**, *23*, 829–842. [CrossRef]
39. Rogers, E.M. *Diffusion of Innovations*, 5th ed.; Free Press: New York, NY, USA, 2003.
40. Hixon, E.; Buckenmeyer, J.; Barczyk, C.; Feldman, L.; Zamojski, H. Beyond the early adopters of online instruction: Motivating the reluctant majority. *Internet High. Educ.* **2011**, *15*, 102–107. [CrossRef]
41. Elo, S.; Kyngäs, H. The qualitative content analysis process. *J. Adv. Nurs.* **2008**, *62*, 107–115. [CrossRef] [PubMed]
42. Graneheim, U.H.; Lundman, B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Educ. Today* **2004**, *24*, 105–112. [CrossRef]
43. Hsieh, H.-F.; Shannon, S.E. Three Approaches to Qualitative Content Analysis. *Qual. Health Res.* **2005**, *15*, 1277–1288. [CrossRef]
44. Mayring, P. Qualitative Content Analysis: Theoretical foundation, Basic Procedures and Software Solution. Social Science Open Access Repository (SSOAR). 2014. Available online: http://nbn-resolving.de/urn:nbn:de:0168-ssoar-395173 (accessed on 2 July 2024).
45. Patton, M.Q. *Qualitative Research & Evaluation Methods*, 3rd ed.; Sage Publications: Thousand Oaks, CA, USA, 2002.
46. Robert, K.Y. *Qualitative Research from Start to Finish*, 2nd ed.; The Guilford Press: New York, NY, USA, 2016.
47. Vaismoradi, M.; Turunen, H.; Bondas, T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs. Health Sci.* **2013**, *15*, 398–405. [CrossRef] [PubMed]
48. ATLAS.ti Scientific Software Development GmbH [ATLAS.ti Windows, v23.4.0.29360]. Available online: https://atlasti.com (accessed on 23 February 2024).
49. Denzin, N.K.; Lincoln, Y.S. (Eds.) Introduction: The discipline and practice of qualitative research. In *Handbook of Qualitative Research*; Sage Publications: Thousand Oaks, CA, USA, 2000; pp. 1–29.
50. Lincoln, Y.S.; Guba, E.G. *Naturalistic Inquiry*; Sage: Beverly Hills, CA, USA, 1985.
51. Shenton, A.K. Strategies for Ensuring Trustworthiness in Qualitative Research Projects. *Educ. Inf.* **2004**, *22*, 63–75. [CrossRef]
52. Wilkinson, S. Focus groups. In *Qualitative Psychology: A Practical Guide to Research Methods*, 2nd ed.; Smith, J.A., Ed.; Sage: Thousand Oaks, CA, USA, 2009; pp. 186–206.
53. Flick, U. *An Introduction to Qualitative Research*, 2nd ed.; Sage: Beverly Hills, CA, USA, 2002.
54. Matthews, B.; Ross, L. *Research Methods: A Practical Guide for the Social Sciences*; Longman: Harlow, UK, 2010.
55. Hennink, M.M.; Kaiser, B.N.; Weber, M.B. What Influences Saturation? Estimating Sample Sizes in Focus Group Research. *Qual. Health Res.* **2019**, *29*, 1483–1496. [CrossRef] [PubMed]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.