Holograms or Hemorrhoids? Student Teachers' Imaginings of the Digital Futures of Education

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ABSTRACT
This study reports preservice teachers' perceptions of desirable and undesirable digital futures for education. Empathy-based stories were collected from 74 student teachers in Finnish professional teacher education. The findings were arranged into three positive and three negative future scenarios. In the positive scenarios, digital tools support human interaction and are subject to the teacher's agency. Teaching and learning remain essentially human activities, whereas technology has a supportive role. In the negative scenarios, learning is reduced to the acquisition of mechanical competences managed by technology and teachers becoming machine operators. These results could guide the development of teacher education, decision-making, and education policy toward meaningful digital futures.

Keywords: *digitalization, teacher education, method of empathy-based stories*

1. Introduction

In much of the research literature relating to teachers and technology, technological development is accepted as an inevitable outside force that determines the future (Markham, 2021). Technological development and the concept of digitalization remain unquestioned and under-problematized, since the focus is on the constant need for

teachers to adapt and upskill, so as not to be left behind. In his examination of techno-logical determinism, Dafoe (2015) points out that if technological change proceeds too quickly and extensively, and if people are not conscious of their technological choices, the probability of unintended – and unwanted – consequences increases. Individuals can have control over their initial technology choices, but if they lack awareness of the potential consequences of those decisions, society may be unintentionally impacted.

Although teachers and prospective teachers necessarily play a central role in digital educational futures, their role in the respective discourse has been limited. As such, teachers have often been seen as objects of digitalization, their role being restricted to its operationalization in education contexts (see Lee & Lee, 2023). Policy documents, vision papers, and roadmaps are used to formulate and present narratives of digita-lization, which turn into generally accepted "truths" concerning digital futures in education, and shape educational practice on different levels (Ljungqvist & Sonesson, 2022; Teräs, M., et al., 2023). Related discussion takes place in what Marcuse (2002) has described as "a closed discourse universe," where specific meanings of a concept have been repeated to the point where they become the one and only way to interpret the concept, rendering other angles of approach unthinkable (Suoranta et al., 2022). In such a climate, narratives of digital futures do not sufficiently consider in-service and preservice teachers' beliefs, values, and expectations in relation to the future of education and digitalization.

This study examines a simple but seldom asked question: What are student teach-ers' perceptions of desirable and undesirable features in alternative digital futures for education? Our approach is in line with research as future-forming, since we aim to create a vision of what education could become, rather than simply illuminating what already exists (Eskola, 1984; Gergen, 2014).

2. Setting the scene: Teachers and digitalization

For the past decade, teachers have been encouraged – or expected – to incorporate dig-ital technologies into their teaching practice (Blankson et al., 2010). Not only that, but the entire working environment of teachers has become increasingly digital (Selwyn et al., 2017), often resulting in growing amounts of digital bureaucracy and admin-istrative tasks (Teräs, H., et al., 2022). In some areas, teacher education programs have mandated preservice teachers to enroll in technology courses to equip them with technological skills (Blankson et al., 2010). Teachers are surrounded by different tech-nological tools, devices, apps, and platforms, and some are already autonomously per-forming pedagogical tasks and supporting different types of learning (Selwyn, 2019). These trends have had a tremendous impact on the teaching profession and the way educational institutions operate.

Reducing the topic of digitalization to teachers' willingness or capability to utilize a specific set of tools does not effectively serve the future of learning and teacher edu-cation. The question is much more complex, and its implications are more profound. Indeed, in the zeal to react to what is happening or is presumed to happen in a (digital)

future, the question often left unasked is the one Neil Selwyn (2019) poses in his book *Should Robots Replace Teachers*: Are we even clear on what we would prefer to happen? The present study attempts to provide perspectives on this question through vocational student teachers' imaginaries of alternative digital futures.

Much of the related research has concentrated on teachers' digital skills and technology acceptance (or lack thereof). The attitudes of teachers and preservice teachers towards technology have raised interest, for instance, in the question of whether they would be eager or reluctant to adhere to the (under-problematized) expectation of adopting digital tools and technology in their practice. (see Hong et al., 2021; Scherer et al., 2018; Yusop, 2015). In addition, in Nordic countries and neighboring areas, popular research topics on teachers and technology have included: examining whether teachers possess the required digital competence to teach in a digitalizing society (see Saikkonen & Kaarakainen, 2021); whether teacher training sufficiently equips new teachers with these skills (Gudmundsdottir & Hatlevik, 2017); or what would be the most effective ways of enhancing teachers' lacking digital skills and competences (see Heinmäe et al., 2021). Various different approaches to this task have also been studied, ranging from digital badging and micro-credentials (Brauer et al., 2018) to educational robots (Heinmäe et al., 2021).

Another area of research has been the impact of digitalization on the profession. In Sweden, Roumbanis Viberg et al. (2019) found that teacher educators' "being and acting" in professional practice are greatly affected by digitalization through implicit and explicit requirements to be digitally competent, and constantly continue to upskill. The digital demand may cause feelings of inadequacy, even professional guilt. Unless teachers develop their digital competences, and enhance their professionalism in the digital realm, their students' future success is at jeopardy (Engeness, 2020; Roumbanis Viberg et al., 2019; Teräs, H., et al., 2022). The pace of digitalization may feel staggering, as educational institutions constantly adopt new digital systems and tools, requiring ongoing learning from teachers. This has given rise to a related research topic, namely teachers' experienced digital or "technology fatigue" (Halupa & Bolliger, 2020).

At the same time, the overly strong focus on the need for teachers to constantly upskill and develop their digital competences have drastic consequences. In addition to professional guilt and digital fatigue, it keeps teachers too busy to have space for reflecting and acting on the ethical dilemmas associated with the digitalization of education, which may arise from phenomena contradicting teacher's values and professional identities (Lee & Lee, 2022; Teräs, H., et al., 2022). The teaching profession is thus in danger of losing human subjectivity, autonomy, and ethical and pedagogical decision-making.

On the other hand, many of the attempts to engage and consult teachers in discussions and policymaking in relation to the digitalization of education can remain on the level of pseudo-engagement (Suoranta et al., 2022). Often events organized for this purpose presuppose the "positive potential" of digitalization, and as such, subjectify teachers as part of the grand narrative of digitalization. Such "engagement" could be

criticized the same way participation in deliberative democracy has been criticized, as engaging people to merely legitimate the existing order (Böker, 2017). Thus instead of genuinely affecting decision-making and providing alternatives, it simply creates the feeling of empowerment and involvement (Eskelinen, 2020).

This study seeks to bridge this gap by engaging student teachers in imagining desirable and undesirable digital futures. By doing this it hopes to bridge two gaps. First, instead of seeing student teachers as objects of a study examining what currently is or is not, it asks them to envision what could be, or indeed, what they think should or should not be in the future. Second, instead of looking at how educators should react to the current or predicted demands of the digital, it turns the tables and asks them to imagine proactively how the digital should be shaped in the future.

3. Methodology: Imagining alternative futures with the method of empathy-based stories

Even conscious attempts to break the grand narrative and imagine alternative futures have proven difficult. For example, Markham (2021) used the Museum of Random Memory methodology to provide scaffolding, through prompts and models for participants to create future imaginaries. Markham interacted with people who had access to endless streams of discourses through different channels (corporate, popular fiction, and everyday conversations) that offer no alternative imaginaries, just the grand narrative where data collection is totalizing, decisions are increasingly automated, and humans continue to merge with machines. They noticed that people's understanding of sociotechnical relations seemed locked inside this grand narrative and its various "discursive closures." As such, their future imaginaries were based on the assumption that the future is inevitable and unchangeable (see also Feenberg, 1999, p. 225).

Art and fiction are often seen as entirely different from science and research (Nisbet, 1977). The former has been considered the venue for using imagination and the free play of fancy. At the same time, the latter is left with "objective" facts and various kinds of methodological procedures. Still, various authors have noted the role and importance of imagination in research (see Mills, 2000; Nisbet, 1977), as well as the similarity between fiction and research texts (Alvesson, 2003, p. 173). Imagination has been seen as the ability to change perspectives (Hannula et al., 2014, p. 12), as the ability to be surprised (Cerwonka & Malkki, 2007), and thus a way to real understanding (Gasset, 1932, p. 12).

Fiction, much like critical theory, has the ability to make the common appear strange, and therefore help imagine alternative futures (Freeman, 2000). With its imaginative capabilities, fiction can be used as a vessel to speculate on how we want the future to look, and to offer possible routes to study and develop a better world (Jasanoff & Kim, 2015, p. 339). Imagination and fiction can also make us dive deeper into our present conditions or technological futures, and their certain sociotechnical formations, and show how there is nothing natural or deterministic in them (Jasanoff

& Kim, 2015). Furthermore, speculative future stories have been argued to help break free from retelling the past and the current hopelessness, and rather be a transformational force for the present (Tomin & Collins, 2024). Imagining alternative futures with the help of fictive methods may therefore be more fruitful than asking the participants to think about what they see as probable or plausible.

The method of empathy-based stories (MEBS) has been seen as an approach to unleash the capacity to imagine different viewpoints and alternative futures (Eskola, 1984; Särkelä & Suoranta, 2020). MEBS has an interdisciplinary history based on role-taking, simulating everyday experiences, and allowing participants to consider different options. (Wallin et al., 2019). It began to be used more frequently, especially in Finland, since the 1980s. The basic idea of MEBS is simple. Research participants are given a brief frame story with which they are asked to empathize, and then write a short story of what has happened before, how the case will proceed, or what will happen in the future. The goal is to tease out ideas and insights which are not self-evident and obvious. The methodological trick is to vary one element of the frame story so that half of the participants receive a slightly different frame story than the other half. This way, the method produces differences and various accounts of the research theme. (Ikonen, 2013; Nishimura-Sahi et al., 2017; Rytivaara et al., 2019; Särkelä & Suoranta, 2020; Wallin et al., 2022.) The varied elements of the frame story are derived from the research question(s), and often the variation is between a positive and a negative version of the story, such as the success or failure of a certain phenomenon (Wallin et al., 2022).

3.1. Participants and context of study

In the present study, the research participants consist of 74 students in a professional teacher education program in Finland. In their stories they imagine desirable and undesirable digitalized futures in education. In the Finnish educational context, professional teacher education is a postgraduate program leading to pedagogical qualification to work as a teacher in vocational upper secondary schools, universities of applied sciences, non-formal adult education, and general education. (Government Degree on Universities of Applied Sciences, 1129/2014). Many student teachers entering the professional teacher education program already work as teachers during their studies. They are typically mature students with former degrees, professional qualifications, and work experience. Their perspectives on digital futures of education are thus interesting and relevant in several ways. First, they are already experienced professionals and have an understanding of their field of study, and therefore are likely to be able to link digitalization to their own teaching context. Second, they are future teachers at the beginning of their teaching careers, which means they are still likely to practice the profession in the future, depicted in the empathy-based stories. Third, they represent different subjects, which brings variety to the stories and makes the results and findings of the study widely relevant and applicable.

3.2. Data collection and analysis

The study was granted ethics approval, and the handling and storing of data were carried out in accordance with the research ethics and data protection guidelines of the university. The participants were provided with information about the study, ethics approval, and data protection protocols, and they had the opportunity to either give or withhold consent to using their story as research material. They had the opportunity to write a story without participating in the research. One respondent chose this option, and their story was not included in the study.

Collection of the MEBS was conducted online using synchronous meeting software. The participants were randomly divided into two groups, utilizing the breakout room function of the software. Each group was then presented with a link to a Microsoft Forms questionnaire, which included information about the research, the opportunity to give or refuse consent to use the story as research material, the frame story, and space to write the story anonymously. No personal information or demographic background was collected, as this was not relevant from the perspective of the research questions.

Half of the participants were given a positive frame story:

> We are living in the year 2050. The practices of digitalization in education have advanced considerably. The situation is very good from the teachers' point of view. Why is this? What makes the situation good? Imagine a situation and write a short story about it.

The other half were presented with a negative version of the frame story:

> We are living in the year 2050. The practices of digitalization in education have advanced considerably. The situation is very bad from the teachers' point of view. Why is this? What makes the situation bad? Imagine a situation and write a short story about it.

We received 39 stories based on the positive frame story, and 35 based on the negative alternative. The stories varied greatly in length and depth. Some were only a few sentences long, whereas some others were much longer and more detailed, with milieu descriptions, protagonists, and imaginative scenarios. However, even the short and seemingly plain ones often contained useful insights. It is noteworthy that in MEBS, the length of the story or the writing skills of the respondents do not necessarily correlate with the usefulness of the data.

The first step of the analysis involved thematization of both the positive and negative stories. Recurring themes were derived from the data, and these were combined to form categories, as illustrated in Table 1 below. Next, the stories were arranged under categories to build scenarios. Excerpts of longer stories could be classified into more than one category.

Table 1: Example of themes and categories

THEMES	CATEGORIES
Sustainable and ethical values guide digitalization	Digitalization slows down and well-being increases
There is a return to analogue and face-to-face modes of working	
Digital tools are used only when clearly justified	
Digital tools support human interaction	
Mundane, boring, and labor-intensive work tasks are automatized	Digital technology genuinely facilitates teacher's work
Technology has become user-friendly	
The number of digital platforms has decreased	
Digital tools and platforms are compatible	
The use of digital tools is subject to the teacher's professional judgment	
Advanced technology enables teaching and learning from anywhere	Ubiquitous learning and quality of life with advanced technology
Advanced virtual technology enables learning practical skills remotely	
Digitalization enables more international learning opportunities	

The identification of themes and categories was followed by rewriting the responses into thematical scenarios, aiming to identify and capture the key elements of the respondents' stories.

4. Results: Positive and negative futures of the digitalization of education

Three positive and three negative scenarios were constructed based on the data. These are presented below.

4.1 Positive narratives

4.1.1 Scenario 1: Digitalization slows down and well-being increases

Digitalization has slowed down, even reversed. People realize that not everything has to be digitalized. Instead, they have rediscovered the value of human interaction. People have come to appreciate the well-being of teachers, students, and the environment, and all technological choices and developments are directed by sustainable, ethical values: "The knowledge worker is not molded into a part of a machine or a robot, constantly running and struggling on the brink of a digital burnout. Organizations have adopted meaningfulness and well-being of employees, teachers, and students as their core values." In fact, technology is only used when it clearly supports these goals. Many traditional, non-digital ways of doing things have resumed as people have realized the negative implications of digitalization. Social interaction, physical presence,

and hands-on learning activities are being valued and promoted again. As a student put it, "People have reduced their use of digital technologies to the bare minimum and moved to a simpler, more sustainable lifestyle."

At the same time, social well-being has become a major purpose of digital tools. Instead of balancing at the edge of "digital burnout" mentioned above, teachers and students engage in social interaction, dialogue, and critical thinking: "Machines serve equality and social justice, and are enablers of discussion on societal issues. Teachers' main task is to teach and facilitate critical thinking and discussion, so that people will again learn what it is to be a human."

4.1.2 Scenario 2: Digital technologies genuinely facilitate teachers' work

Scenario 2 introduces ideals similar to Scenario 1, but here they are attained through the help of digital technology, rather than by reducing or giving up the use of technology. In this scenario, digitalization has proceeded to the point where it genuinely makes teachers' work easier. All bureaucratic and mundane work tasks have become automatized, and teachers have much more time than before to concentrate on human interaction, teaching, facilitation, and guidance of students. There are only a few digital tools and platforms, and they are very intuitive to use. They are also compatible with each other. In fact, they have become almost invisible. As a student put it, "Technology works well, and the teacher doesn't even notice it when teaching. Teachers can manage their own work, and their agency and subjectivity overrule the restrictive and imposing practices and structures of ICT systems." Digital tools are used for well-defined purposes, and only when there is clear added value. "Digital tools are used only when there is a clear benefit. Digital tools are a means to an end, there's no digital for the sake of the digital."

Because technology takes care of many burdensome tasks, teachers are less busy, and can concentrate on activities that support the learning and growth of their students. Teachers have agency and control over technology. "We have gone back to a time when digital tools were just tools, and they exist for humanity to advance well-being and sustainable living."

4.1.3 Scenario 3: Ubiquitous learning and quality of life with advanced technology

In Scenario 3, technology has advanced significantly, and its use has increased rather than decreased. In this scenario, highly advanced virtual technology enables lifestyles that were not possible in a world where many work tasks required physical presence in a given location. Technology makes it possible to work remotely, and therefore many have escaped hectic urban environments and relocated to the countryside, or other locations they prefer to live in. This has slowed down urbanization, as many are finding better quality of life in more remote areas. Moreover, as technological development has advanced, teaching practice-oriented vocational subjects remotely has become possible. A student envisioned a future as a vocational teacher with wonderful work-life balance.

> I log in to my smart watch in a wilderness cabin in Lapland, letting it know my workday is starting. Students are already there as I put on my 3D glasses, and we move to study in a virtual restaurant environment. Students can touch dishes and utensils in the learning environment and prepare "real" food virtually. … We move on to evaluate the dishes, and AI provides us with a helpful analysis of pros and cons, as well as tips for future improvements. After the workday I inform my watch that the day is over, and it logs me out of all work applications. I move out onto the deck to admire the autumn colours of the Lappish countryside, and congratulate myself for graduating as a vocational teacher back in 2022.

Such technologies also enable traveling, international networking, and exciting professional opportunities, as in the story of one student who described attending a professional fair in Milan and sharing the experience with their students through advanced virtual technology. The story ends with a vivid description of a smiling, happy teacher admiring the students' good learning outcomes, while sitting in a chic bar in Milan sipping a refreshing drink.

4.2 Negative narratives

4.2.1 Scenario 1: Pedagogy is not needed

In scenario 1, digital tools, such as artificial intelligence, have changed the role of the teacher. Preparing courses, teaching, facilitation, assessment, and helping and guiding students are no longer a part of teachers' work. These tasks are carried out by digital technologies. Instead, the teacher's role is to be a "machine operator," managing an ever-increasing digital bureaucracy.

> The work of the teacher is mainly about managing different applications, user interfaces, and programs. Teachers don't meet students face-to-face, and not even through video calls. Students have become a series of numbers and data points that the teachers manage and move from one system to another.

Bureaucracy has not been automatized the same way as teaching and learning activities are. The most important skills of a teacher are now related to managing a daunting number of digital applications and tools. Pedagogical skills are no longer needed. Teachers must use digital tools for everything, most importantly for tailoring and managing highly individualized learning pathways for all students. Teachers' work has become burdensome, repetitive, and mechanistic. Their contact with students has been reduced to managing student data on digital learning platforms that utilize learning analytics. The well-being of teachers has plummeted. At the same time, students' learning has become more superficial. Students rely on technology, and do not invest much time and effort into learning. The following excerpt of a story paints a sad picture of a teacher's work.

> All teaching is online. I haven't met any students in person for years. There's a lot of data available on their actions, but I wonder if it tells anything about their learning. My work is also constantly monitored and surveilled through data, which puts an awful lot of pressure on me. Digital work is exhausting. My well-being has plummeted, I suffer from constant brain fog.

4.2.2 Scenario 2: Teachers are not needed

Scenario 2 takes the development one step further. In this scenario, teachers are not even given the role of a machine operator, they are no longer needed at all. They have been completely replaced by artificial intelligence and digital applications and tools. At the same time, the nature of learning has been reduced to acquiring isolated competences, information delivery, and completing assignments and assessment tasks, which are automatically prepared and marked by artificial intelligence. Learning has become an individual pursuit, without much contact with other people. "Everything is online, AI designs learning tasks and marks them. There is no social interaction anymore, everyone is learning independently on their own."

Consequently, social and health problems have increased significantly. Anxiety and fear of social situations have become commonplace, and the lack of social interaction has led to the deterioration of social and communication skills. "...People can no longer interpret or produce facial expressions and communicate or show their feelings." As everything takes place online, students remain locked in their homes for days, playing video games, not eating healthily, and even ignoring their personal hygiene. "The virtual and the physical are completely intertwined, causing isolation, fear of social situations, self-destructiveness, and other issues." Physical ailments resulting from immobility have also increased, as one story depicts. "Both teachers and students suffer from back pains, indigestion and hemorrhoids, because they are constantly sitting in front of the computer."

4.2.3 Scenario 3: Teaching and learning are not needed

Scenario 3 takes this development to the extreme – not only pedagogy and teachers, but the entire concept of learning has become obsolete. Nobody needs to spend time teaching or studying anymore, because technology has finally developed to the point where one either has a device installed in their brain, or they can purchase microchips that contain a desired set of skills and competences. "Everyone has a device installed in their brain that constantly transmits and receives information. This device is installed in preschool." Anyone can acquire a desired set of skills simply by injecting the microchip into their body. Needless to say, these microchips are costly, and they have become a lucrative business. The more prestigious the profession, the more expensive the chip. For instance, a lawyer chip is much more expensive than a nurse chip. This leads to even greater inequality than before, since studying, hard work and good performance no longer mean anything. "Technology has advanced so much that studying has been replaced by microchips, which people can buy and have installed in

their bodies. This leads to massive inequality, because the best-paying professional microchips are very expensive, and students who cannot afford them cannot work towards better jobs by studying hard."

In this scenario, science is frowned upon, and learning has been reduced to acquiring and installing competences. The few who still believe in science, education, and critical thinking meet each other in secret sessions where mobile devices are not allowed so that they cannot be tracked. "Science is not appreciated anymore. Megacorporations rule the world with their propaganda. Teachers meet the few who still want to learn in secret sessions in physical spaces that are more difficult to track and locate."

5. Discussion

The stories written by the student teachers provide valuable insight into their perspectives on digital technology, but they also reveal some key elements of their perception of the teaching profession, and the values and principles on which their professional identities are built. These observations create a lens through which their ideas on technology can be interpreted in more depth, going well beyond the simplistic approaches where teachers' relationship with technology is perceived as a set of digital skills that they either possess, or need to acquire. The question of teachers' digital future is thus more than an imagination of the kinds of tools and technologies that should (or should not) be in use in the coming decades. Instead, the frame stories teased out significant reflections on agency, identity, and the essence of teaching and education.

In the positive scenarios, technology was described as either absent or unobtrusive, even unnoticeable. Technology's role is to stay in the background, in a supportive and subordinate role, freeing teachers' time and energy for the pedagogical tasks that are at the core of their expertise. The positive scenarios emphasize the importance of social interaction in teaching and learning, and see this as an essentially human endeavor that cannot be satisfactorily substituted by technology. Indeed, fostering this human interaction, and facilitating the learning that takes place through it, are seen as key elements of the teaching profession. Similarly, learning is understood as a human activity, taking place in and being enabled and supported by human interaction.

The negative scenarios depict a gradual loss of the essential elements that constitute the writers' sense of professional identity, professional pride, and expertise. In the first scenario, pedagogical expertise becomes obsolete, as technology replaces teaching and learning activities, leaving teachers with mundane and burdensome bureaucratic tasks, and the management of digital tools and applications. The second scenario goes a step further, rendering teachers useless, as artificial intelligence takes over the tasks that used to be essential to the teaching profession. Finally, even education itself becomes needless, as learning and education are reduced to the mechanistic acquisition of skills and competences, which can be downloaded on a microchip as technology develops. Indeed, education in the traditional sense of the term becomes punishable, since it involves critical thinking, which apparently threatens the consumeristic worldview that prevails in this scenario.

Essentially, both positive and negative scenarios reveal how the student teachers understand the profession of a teacher, and what they value in it. Human interaction, teaching, supporting, and facilitating learning, spending time with students, and the opportunity to exercise creatively one's pedagogical and subject matter expertise stand out as key elements of the teaching profession. Also, the work-life balance and well-being of both teachers and students are clearly important, recurring themes in the stories. The positive future scenarios describe situations where these elements are present and fostered, whereas in the negative ones they are either threatened, or completely removed. For these key factors to be in place, the stories assumed that technology would be "out of the way," either by being completely absent, or by having become intuitive, user-friendly, and genuinely helpful, because it automates tasks that are not seen as teachers' key competences, such as reporting, student management, or other bureaucratic work tasks. The assumption of invisible or non-existent technology as the prerequisite for a positive digital future is interesting and may suggest that some of the writers now see technology as a hindrance or an impediment, which somehow interferes with or complicates what the writers perceive as teachers' core work tasks.

Artificial intelligence stands out as one of the technologies singled out in the stories. Again, its usefulness is assessed by the degree to which it functions as a tool that frees teachers' time and energy to exercise pedagogical expertise, by performing the bureaucratic and routine tasks on behalf of the teacher. In the negative future scenarios, the situation is the opposite. AI has taken over the pedagogical tasks, whereas teachers are left with reporting, monitoring and data management. The scenarios touch upon questions such as the essence of a teacher's competence, professional expertise, and job description now, and in the future, as well as the role that technology plays in all this.

The stories provide practical examples that illustrate the point Selwyn (2019) has made with regard to the importance of remaining mindful of the socio-technical implications of AI in education. Indeed, AI should be seen as more than a mere tool that may or may not be used in education, as it "...involves likely reconfigurations of power, especially in terms of who gets to decide what 'teaching' and 'learning' is" (Selwyn, 2019, p. 103). As such, what is often disregarded is that the implementation of AI, and who uses it for whatever purpose, is not only a technical question but also a political one, related to power and governance (Crawford, 2021). It also encompasses a vision of centralized technological control, which thwarts thinking of other forms of social organization (Crawford, 2021, p. 368).

Current developments in educational policy and decision-making globally form a context in which these questions are justified and expected. Educational policymaking has, in recent years, been increasingly preoccupied with the effective and measurable production of predefined and demonstratable learning outcomes and competences (Biesta, 2013; Zeide, 2017). Technologies, such as learning analytics and AI, are harnessed to streamline the process and allow its constant monitoring. At the same time,

the prevailing educational narrative is permeated by the expectation of education providers to develop their operations to facilitate continuous learning through individualized, flexible learning paths, modular courses, micro-credentials, MOOCs, and other activities, which build on a conception of learning as the acquisition of competences, rather than on the philosophy of education stance promoting the holistic development of the learner. These digitally driven educational approaches are highly individualized for effectiveness, placing increased demands on learners' self-direction, and offering decreased opportunities for social interaction, dialogue, and collaboration with others (Roumbanis-Viberg et al., 2020). Moreover, in their reliance on measurable, quantifiable activities, these approaches may shift education away from a plurality of purposes. The negative scenarios portray situations where this development has reached the point in which all social and collaborative aspects of learning have been reduced to machine-readable interactions, and the role of the teacher is merely to operate the technology that is used for the mass production of competences. These stories align with the predictive analytics narrative presented by Jarke and Macgilchrist (2021):

> In this story, the primary role that teachers are given is as managers who oversee, design interventions, check the effects of their interventions, improve efficiency and effectiveness, etc. The multiple further roles of teachers (as carers, entertainers, justice activists, confidants, etc.) are rendered invisible, 'out there', and thus irrelevant to this understanding of successful education. (p. 7)

Narratives told by such technologies are compelling and affect the future, however these technologies do not objectively capture the messiness of everyday working contexts (Jarke & Macgilchrist, 2021, p. 12; see also Thatcher & Dalton, 2021, p. 7). Indeed as, for example, O'Neil (2016) has discussed, technologies such as predictive models are developed by people with their own views of reality, and what matters in specific contexts. Technologies are designed with social and economic choices in mind, they do not stem from objective reality (Thatcher & Dalton, 2021). Instead of being depictions of the world, data also create it (Staunæs & Brøgger, 2020).

One could argue that the stories in this article depict a conservative approach to technology, and the return to a nostalgic history of the teacher as the "sage on the stage." Naturally this might be true for some teachers, but it would sustain the unfortunate and sometimes prevailing narrative that teachers are against development or digitalization. Instead, the stories emphasize the importance of human interaction and community. Since the dawn of e-learning, online learning, and computer/technology-mediated communities in general, many authors have acknowledged the importance of human interaction and the role of fostering a community for learning and knowledge building (Garrison et al., 2010; Herrington et al., 2010; Howland et al., 2014; Palloff & Pratt, 2007; Roberts, 2004; Scardamalia & Bereiter, 2014; Wenger et al., 2009).

The learning community has been recognized as an important factor in engaging learners with their studies, constructing new knowledge, and providing peer support in studies (Vesley et al., 2007). In these texts, often based on the social constructivist perspective, knowledge and understanding emerge through learning community interaction, instead of individuals consuming information on their own (Jonassen & Rohrer-Murphy, 1999; Palloff & Pratt, 2007). It appears that many of the latest developments in the digitalization of higher education seem to emphasize the "information" part of *information and communication technologies.* Perhaps these teachers' future visions are indicative of this shift, and of the fact that using technology for building online learning communities elicits less attention than the potential of technologies such as learning analytics, artificial intelligence, and the like.

The results also pertain to the question of how the teaching profession is understood. Teachers' digital identity has been discussed earlier by Engeness (2020), who suggests that such an identity can be developed by teachers' engagement in online learning and the design of digital environments to support student learning, as well as the acquisition of cultural (digital) tools that enable participation in and contribution to social practices. However, this discussion still remains within the boundaries of the discursive closures observed by Markham (2021), as emerging technologies not only put pressure on professional competence, but also lead to reimagining the role of the teacher altogether (Selwyn, 2019). Whereas the discourse concentrating on teachers' ability to use digital technologies for pedagogical purposes is still associated with the teacher's role as a pedagogical expert, digitalization of education carries more far-reaching implications. Indeed, the very notion of teacher professionality is shifting towards the role of a managerial data analyst, whose task is to monitor and interpret dashboards, and make decisions based on that data (Jarke & Macgilchrist, 2021). Furthermore, recent data practices standardize teachers' work and thus, how they see, experience, and interact with students (Grant, 2022; see also Selwyn, 2022). They remove pedagogical decision-making from educators to automated, data-driven systems, thus narrowing teachers' academic autonomy, and depriving them of the opportunity use their core expertise (Zeide, 2017). Therefore, teachers acquiring new digital competences is not only a matter of upskilling, but also of creating and adopting a new teacher identity or subjectivity, teachers as "data-workers," which is more in alignment with neoliberal logic (Ball & Grimaldi, 2021; see also Knox et al., 2020). The question of teachers and digitalization thus goes well beyond methods and tools for teaching and learning. Instead, as Selwyn (2019) points out, there are several social, cultural, economic, and political connections and implications that need to be explored and critiqued. He also goes on to emphasize that AI in education is inseparably connected to the fundamental existential question of our time – also raised in the stories of this study – what does it mean to be human in a digital age? The words of Castadeña and Selwyn (2018) capture the sentiments also expressed in the stories of this study:

...digital technologies do not simply support the transmission or exchange of information between staff and students. Instead, these technologies mould peoples' values, beliefs and behaviours. Conversely, it is also necessary to explore how these digital technologies are themselves shaped by people's emotions, moods and feelings − for example, exhaustion and excitement, boredom and flow, discomfort and relief. All of these issues highlight an area of change that is difficult to pin down − that is, how digital technologies are altering what it is to be human while at university. (p. 4)

In his book *The Revolution of Hope: Toward a Humanized Technology* (1968), Erich Fromm, the German sociologist associated with the Frankfurt School of Critical Theory, asked where we are now and where we are headed. He argued that humanity has developed a machine, which has begun to live its own life and determine our thinking. Perhaps a dire claim, but his point was to focus our thinking to ask: Do we even know what we want to use our technologies for? Currently, there are various competing agendas, also in education. On one hand, digital transformation is seen as something that universities should embrace in the name of a competitive edge (Mohamed Hashim et al., 2022). On the other hand, digital technologies in the service of "techno-commercial logic" and "assetization of education" are argued to have dire transformative impacts on education, which can lead to corporations and commercial logic gaining unwarranted control over the educational sector and its people, processes, and pedagogy (Hansen & Komljenovic, 2022). At the same time the benefits of, for example, automation and its social and societal implications remain contested and need further research. This is the pressure encompassing the results of the current study. When developing educational and organizational policies, do we consider only commercial logic, the abstract notion of efficiency, and keeping up with the times (Selwyn, 2022), or do we also include peoples' hopes and dreams as part of developing future policies and practices? We argue for the latter.

A viable framework for achieving this is what Robert Jungk and Norbert Müllert describe in their 1986 book *Future Workshops: How to Create Desirable Futures.* They introduce future workshops as a tool for engaging people to imagine their future, in order to democratize it. We have used this method with mixed groups of stakeholders, in order to envision digital futures for a higher education institution from multiple perspectives. Our work in this area is currently in progress, and we will report the results in the near future. However, mere imagination is not enough. We should also determine how we operationalize these hopes and development ideas within our current time and context (Troxler & Kuhnt, 2007). The results of speculative and participatory studies should be used as background study material in strategic organizational development. Otherwise, such imaginaries of the digital futures of education will remain a mere exercise, without impact. Such approaches should fit especially well into the Nordic countries' policymaking culture, given that Nordic values and public policy are traditionally based on the ideals of democracy and equity. Indeed, the idea of the "Scandinavian model" is still an important concept for policymaking (Ljungqvist & Sonesson, 2022).

6. Conclusion

In this study, student teachers' hopes and fears relating to the digital futures of education have become visible through the method of empathy-based stories. The positive narratives present the need for a higher degree of teacher control over the use of technology, as well as well-planned and meaningful use of digitalization. The negative stories illustrate futures in which pedagogy, teachers, and teaching and learning become gradually obsolete.

At the beginning of this paper, we referred to Dafoe's (2015) sobering remark on the dangers of under-problematizing technological development and the concept of digitalization: Being insufficiently conscious of the technological choices made, and their consequences, may lead to fundamental but unintended – or unwanted – changes in society. The negative scenarios presented in this study are imaginaries of such unwanted and fundamental changes in what education essentially is, what the role of the teacher is, and even what it means to be a human in the digital future of education. Teachers, let alone student teachers, are not typically asked these questions when educational policies are formed, and decisions are made. Instead, they are faced with the continuous expectation to busy themselves with professional learning activities, and to keep up with technological developments.

In these futures, artificial intelligence and other digital technologies have replaced the teacher's agency, while the teacher has been left with menial bureaucratic tasks as "the machine operator." The positive and negative scenarios indicate that the respondents consider the digitalization of education from multiple perspectives, going well beyond the often-heard questions of teachers' digital skills and competences. The stories describe implications for social interaction, well-being, and the very conceptions of teaching and learning. Essentially, the stories involve questions of professionalism and identity, and the impact digitalization may have on them. As noted also by Selwyn (2019), the stories recognize that digital technologies in education are more than simple tools. Rather, they carry assumptions about what education is, and can potentially alter roles, goals, and values associated with it.

Feenberg (2009, p. xiv) has argued that regarding technology only as a deterministic phenomenon that washes over us might enforce the idea that nothing that we do can affect these developments. This is also related to Markham's (2021) notion of inevitability: If teachers experience digitalization and datafication as a huge wave that just rolls over them, it will directly affect their sense of agency, and how eager they are to develop their work (see Teräs, H., et al., 2022). Instead, as Feenberg (2009) continues, we can influence these technological developments, but we need to involve our perspectives actively in their design and implementation. This is especially important in the development of policies and practices related to teacher education, considering the inherent future orientation of the field. We see the combination of the positive and negative scenarios presented in this study as suggesting steps toward this. Instead of relying merely on the taken-for-granted positive grand narrative of digitalization and datafication, more collaboration and exchanging of ideas are needed.

In terms of educational policymaking and professional practice, the findings of the study provide valuable insights and the perspectives of prospective teachers, who are key players in the future of education. It is worth noting that the teachers' stories may not necessarily advocate a reduction in the use of technology. Instead, they recognize learning and teaching as complex human activities, which cannot be driven by technology without significantly altering their purpose, towards a more simplistic and mechanistic reality. By recognizing the need for technology to function as a supportive tool for fostering meaningful human engagement, educators aim to strike a balance, where technology enriches pedagogical practices by facilitating collaborative learning experiences, rather than replacing the essential human element in education.

Acknowledgments

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