Desirable and realistic futures of the university: a mixed-methods study with teachers in Denmark

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Abstract

In this paper, we put in dialogue the local dimension of a nation-state with the global challenges faced by universities worldwide. We focus on the case of Denmark, a nation that was exceptionally active in implementing international university reforms and where digitalisation is a high priority of the public sector governance. The article seeks to contribute to speculative research and critical studies by presenting a mixed-methods study that explores higher education teachers' views about desirable and realistic future scenarios in Denmark. The study draws on data from a survey applied at a large Danish university, analysed both quantitatively ($N = 755$) and qualitatively ($N = 53$). The findings show that teachers share clusters of concern about uncontrolled digitalisation and teaching automation, commodification of education, and modularisation of university courses, the latter being a contested but realistic perspective in the latest political reforms. They reaffirm the mission of the university as preparing students for solving real problems and contributing to the challenges of the present time. The paper concludes with a call for university management to recalibrate future imaginaries to the values expressed by the teachers, and the university they wish to create.

Keywords: Future of the university, Digitalisation, Higher education teachers, Speculative research, Denmark

Introduction

In the last two decades, international organisations such as the Organisation for Economic Cooperation and Development (OECD), the World Bank, and the European Union have joined forces to reform universities worldwide. National governments have been called to direct universities toward the production of high-skilled graduates, in response to the needs of a 'future global knowledge society' (Wright, 2020), and with expected returns to the national economies. Curricula have been reshaped to focus on so-called 'competencies', which made it easier to assess institutions comparatively (Tröhler, 2021).

At the same time, a range of private business companies that operate transnationally have turned to the university to participate in research, consulting, auditing, and offering

study-work programs for students (Wright, 2020). The emerging normative frameworks and newly institutionalised relations of power have challenged the societal role of public education, as well as the academic values based on the idea of the university as a 'common good' (Barnett, 2004).

In addition to the uncertainty generated by this landscape of reforms and the general influence of private companies in the public sector, universities are also deeply transformed by digitalisation, with increasing institutional reliance on technological tools that automate student services, provide platforms for online teaching, and integrate analytics into advising and grading (Bygstad et al., 2022; Tømte et al., 2019). Accelerated and entrenched during the COVID-19 pandemic (Rosak-Szyrocka et al., 2022), digital solutions are often framed as 'silver-bullets' (Campbell-Verduyn, 2021) for improving higher education and developing the competencies for the future global society. Nevertheless, digitalisation challenges higher education teachers' autonomy and trust, with opaque procedures of data collection and manipulation (Beetham et al., 2022; Gràcia and Sancho-Gil, 2021) and the redistribution of teachers' roles in a direction that points at deprofessionalisation (Grimaldi & Ball, 2019), loss of ownership (Czerniewicz et al., 2023), and erosion of academic values (Feenberg, 2012).

In this paper, we put in dialogue the local dimension of a nation-state with the global challenges faced by universities worldwide. We focus on the case of Denmark, a nation that was exceptionally active in implementing university reforms since the Bologna process (Wright, 2019, 2020), and where digitalisation is a high priority of the public sector governance (Tømte et al., 2019). We aim at exploring the role of digital technologies not only in current Danish higher education, but also in the imaginaries that the academics have about the future universities. That is, their projections, suppositions, and speculations of how current trends will transform institutions in the future.

To do this, we move from a sociotechnical perspective that understands imaginaries as co-produced by several actors in the interaction of the forms of power they exercise (Jasanoff, 2016). Policy makers have the power, through reforms, to change the nature of the organisations and the dynamics among the different actors involved (Carney, 2020). The market has the power to anticipate trends and create narratives about research on future innovations (Ross, 2023), spreading ideals of growth, efficiency, and progress (Macgilchrist, 2019) over the pursuit of knowledge (Wilkinson & Wilkinson, 2023). Scientific problem framings have the power to influence social narratives and the related instruments of governance, economic policies, and engineering solutions (Jasanoff, 2016). In a tight relationship to science, technology has the power not only to carry/enact the values of systems of meaning and ethics in which it is embedded, but also to make its workings of power invisible. This is materialised in the capacity of largely unregulated digital giants to act as 'data oligarchs', which are more powerful than national governments in mobilising subjects and consensus (ibid.).

Despite the complexity of these discursive-material interactions, we understand universities as sites where the different forms of power can be historicised and discussed (Means, 2018), and where educational imagination can be nurtured towards projects of 'revolutionary futurity' (Freire, 1996).

In this article, we explore how teachers are responding to the current changes of the university and how they envision the future of Danish higher education, in the face of

the increasingly dominant imaginary of a technology-driven university (Bayne & Gallagher, 2021). The study departs from speculative future research, defined by Ross (2023) as a research approach to imaginatively explore the question of 'what's next' for higher education. Quite unconventionally in relation to the tradition of speculative research, we use quantitative and qualitative data from a large-scale survey with university teachers, guided by the following research questions:

> *RQ1: Which future scenarios do higher education teachers find desirable and realistic in Denmark?*

> *RQ2: How do individual teachers interpret and position themselves within the proposed scenarios?*

In the next sections, we begin by introducing the Danish context of university reforms and its relationship to the global context. We then move on to describe our conceptual research framework – speculative futures and imaginaries – and the data and methods of our study. Next, we present the results of our analysis and discuss them with the theoretical support of critical studies.

Higher education in the Danish context

International organisations such as OECD and EU have largely impacted higher education in Denmark in the last two decades. Since 2000 up until 2015, there has been an emphasis on internationalisation, lifelong learning and the need to attract international students and faculty to increase academic excellence (Vlachou & Tlostanova, 2023). At the same time, international trends such as the financial crisis in 2008, the migration crisis in 2015, and Brexit have led the Danish governments to take political initiatives focused on regional capacity building, adjustment of international student intake and national protectionism (Brøgger et al., 2023).

A quality system based on accreditation has been introduced after the university reform in 2003, which increasingly defines higher education institutions as market actors (Danish Government, 2006). Combined with the attempts of the universities to enrol more students, this system has significantly transformed higher education governance in the direction of competition, not only on a global scale but also between national programmes (Rasmussen, 2014).

Some of the latest political reforms faced major criticism from the universities (Wright & Ørberg, 2019). In particular, the regionalisation-initiative that was presented in 2020 and 2021 which focused on increasing regional development and reducing social inequalities became the object of intense debate. More recently, a political reform approved in 2023 established to reduce 30% of all graduate degree programmes by 50% (from two years to one year and three months) to increase students' labour-market value. The reform received heavy criticism from the university management (Uddannelses- og Forskningsministeriet, 2021) and has spread uncertainty among academics, who are left with no information about the programmes that will be affected, and the way curricula will be reshaped to comply with the requirements.

The Danish government has long been at the frontline of developing digital solutions in the public sector, including higher education institutions (Haase & Buus, 2020),

and even before the pandemic the uptake of digital technology in education was high (Vintergaard, 2018). Early initiatives focused on the use of digital tools for teaching and learning, but in recent years there has been a shift in focus towards digital competencies and computational thinking (Christensen, 2023; Nicolajsen et al., 2021). Previous studies report how external and internal processes of digitalisation of higher education are always working together (Riedner & Pischetola, 2021; Tømte et al., 2019). On the one hand, governments influence how universities handle technology through policies, funding, infrastructure, and requirements for quality. On the other hand, digitalisation is driven internally by IT units and staff that sometimes do not have pedagogical knowledge, which can result in processes that reflect institutional goals but with limited impact on teaching and learning practices (Rienties et al., 2013; Tømte et al., 2019). The struggle between external and internal process of digitalisation is also evident in the case of Denmark as well as in the university in focus here.

In 2019, the national government introduced an action plan to enhance digital competencies among higher education students, backed by an investment of 45 million Danish Krones (around 6 million Euro) for long-term staff development (Uddannelses- og Forskningsministeriet, 2019). Internally, the use of digital technologies is backed up by Danish university strategies, although the way digitalisation is vaguely defined in national policy documents causes problems at the level of implementation (Brøgger et al., 2023; Haase & Buus, 2020).

As a whole, international/national reforms and action plans situate Danish higher education teachers in a system that is increasingly digitalised, contending with internationalisation and global trends, student and faculty cutbacks, new internal structures with shorter education, and competition on the market. These are the contextual issues informing the future imaginaries we studied among Danish teachers.

Speculative futures and imaginaries

An observation from critical studies in education is that the dominant future imaginary of the university is increasingly technologised, datafied, and surveillant (Bayne & Gallagher, 2021). In this imaginary, value is given to predictive analytics, blended and hybrid delivery on digital platforms, and machine learning able to provide customised educational paths for ubiquitous learning (Means, 2018). This imaginary lies on the assumption that educational change will depend more on technologies than on social relationships (Pischetola, 2021), despite scarce research evidence that the implementation of digital tools enhances education in lasting ways (Selwyn, 2023).

According to Clark (2023), the positive appraisal of digital technologies in education is rooted in three grounding narratives: transformation, social justice, and economic reimagination. Characterising higher education as outdated, the transformation narrative positions digital technologies as a need for institutional renovation. At the same time, educational technology is described as a tool empowering individuals and creating more equitable learning environments (Ossiannilsson, 2021), advancing social justice. Finally, this grounding narrative is emblematic of liberal views, with student-centred learning, flexibility, merit, and self-motivation as core values – and is strongly encouraged by commercial interests (Williamson, 2021).

To craft a project where the potential of the university is fully expressed, several authors suggest seeking alternatives to the dominant digital narrative (Fűzi et al., 2022; Williamson & Komljenovic, 2023). This entails supporting open-ended and generative approaches to keep open the possibility of novelty in the future (Facer & Sandford, 2010; Selwyn et al., 2020). In other words, when we think about the future of the university, we should acknowledge that the role of digital technologies in it is yet to be decided (Czerniewicz et al., 2023; Means & Slater, 2023).

Imagining the future of education has a long tradition in research (Facer, 2022; Means, 2018; Selwyn et al., 2020) and central to such work is the understanding that there is not *one future*, but rather multiple imagined futures (Ross, 2023). Speculative research works with the future as a space of uncertainty, in line with traditions that tackle complexity, non-linearity, and wicked problems.

Speculative methods take various forms, including fictions, design activities, role-play scenarios, and speculative analysis. Across these methods, the purpose is not to explore what is effective—which is a common approach in future research focused on evaluating and designing technology (So & Bonk, 2010)—but rather what is desirable and realistic beyond the present (Facer, 2021).

Speculating about the future as multiple rather than singular is informed by the concept of sociotechnical imaginaries—a discursive construct that reflects collectively held understandings of desirable futures (Jasanoff, 2016). In a sociotechnical perspective, technologies are always embedded in situated assemblages, where they exercise some kind of agency in educational environments, and where their *doing* often has unexpected consequences (Alirezabeigi et al., 2020; Pischetola et al., 2021). Sociotechnical imaginaries are relevant tools to speculate about the future of technology in education as they carry with them powerful sets of beliefs and ideals. By speculating about the (non-)desirability of a sociotechnical imaginary, the participants are invited not only to express their beliefs, but also to reaffirm their agency and their power, and to challenge the status quo.

A recent example of speculative work treating teaching as an imaginative profession comes from Bayne and Gallagher (2021). In their Near Future Teaching project, they conducted participative and collective processes of speculation about alternative imaginaries. They argued that an exercise of 'critical anticipation' might support the co-design of an institutional vision that rejects for-profit values. Based on this idea, they created a set of possible future scenarios distilled from reviews of technological and social trends that were discussed in relation to core values for university education. Based on their first study and in collaboration with Jen Ross, they outlined in December 2022 eight new speculative scenarios for the future of higher education (University of Edinburgh, 2022). In Table 1 later in the text, it will be clarified to what extent each scenario has been a source of inspiration for the eight scenarios proposed in our study.

Methods

Speculative futures research typically involves presenting artifacts or scenarios that spark discussion, a method that gathers in-depth insights from participants (Ross, 2023). What we are presenting here is a descriptive study based on a survey with mixed-methods analyses, which offers a starting point to develop further in-depth qualitative studies at our institution. We frame our approach as co-evaluative (Krogstrup & Mortensen,

Table 1 Scenario development

#	Survey scenario	Source of inspiration	Survey Prompt
1	**Orientation towards 'real' problems**	Adapted by merging two scenarios from the University of Edinburgh (2022): **Extinction-era universities:** "Climate disaster is well underway, resulting in global food and water insecurity, uprisings and mass movements of people. Universities lead the global response. They no longer compete for funding or prestige, but work through global research networks focused on coordinated responses to planetary crises" **Justice-driven innovation:** "Unrest arising from acute societal division and unequal access to wealth prompts radical political change, and pressure to develop new economic, social and governance models Universities' 'third mission'—to create and share knowledge to resolve societal challenges—becomes their first mission. In the large research-intensive universities, disciplinary structures give way to radical transdisciplinarity focused on specific social challenge areas: poverty, climate, equality, governance and justice." We have moderated and adapted these two scenarios inspired by a Danish tradition for problem-based universities. Especially Roskilde University and Aalborg University	Education increasingly focuses on global crises and sustainable behaviour, and teaching is aimed at acting on and solving 'real' problems
2	**AI-supported teaching**	Based on the original scenario **AI Academy:** "AI is working across massive, linked databases do all the heavy lifting of academic work (…). Conventional student assignments are no longer required, as AI-enabled analysis of historic, behavioural and neuro data provides an instant categorization of their capabilities" (University of Edinburgh, 2022)	Tasks related to preparing and delivering teaching are increasingly automated and supported by artificial intelligence (AI)
3	**'On demand' education**	Based on the original scenario **The universal university:** "Anyone anywhere can participate in university as new routes to access are mandated by governments across all countries" (University of Edinburgh, 2022)	Universities will have fewer master's degree students and instead offer intensive and focused courses that can be taken throughout people's working lives

Table 1 (continued)

#	Survey scenario	Source of inspiration	Survey Prompt
4	**Commodification of education**	The original scenario **Extreme unbundling** is divided into two concerns, Commodification and Modularisation. We have made one prompt based on the first half of the original scenario: "Teaching is sold through a hyper-fragmented market of education services, and higher education is re-framed as 'super-skilling'" (University of Edinburgh, 2022)	Education will become a commodity with universities competing against private education providers
5	**Modularisation of education**	and one prompt following the second half of the **Extreme unbundling** scenario: "People learn through life, accumulating various forms of microcredit in a portfolio validated through reputation management systems and performance analytics" (University of Edinburgh, 2022) The reason for considering these as two different questions in a Danish context is that while the governmentally driven model for university funding is unchallenged – there is a large push for providing lifelong learning and modularisation	The educational structure shifts from being based on curricula and defined degree programmes to modules that each student can combine as they see fit
6	**Integration of data science**	Integrating data science into the disciplines is very much in line with the strategic ambitions of the University of Copenhagen, but it also frames the future in terms of a natural continuation of the existing division in disciplinary fields. In this sense, it can be seen as a less radical version of the scenario **Return to the ivory tower** (University of Edinburgh, 2022)	Data science is integrated in other disciplines
7	**Development of critical skills**	Based on the original scenario **The university of ennui:** "(…) there is massively increased demand for higher education that advances creative, critical, philosophical and social skills" (University of Edinburgh, 2022)	Degree programmes increasingly focus on developing students' creativity, problem-solving skills and critical sense
8	**Datafication of learning**	Based on the original scenario **Enhanced enhancement:** "Enhanced campuses incorporating routine use of facial, engagement and emotion recognition technologies are mainstream across all education sectors" (University of Edinburgh, 2022)	Students' use of digital tools and platforms generates data that teaching staff use for planning, assessing and supervising

2021) and argue that it sits within the family of research that uses speculative methods to favour collective world-making and value people's abilities to provide solutions to social problems (Suoranta & Teräs, 2023). At this respect, Krogstrup and Mortensen (2021: 72) suggest that practitioners can provide "an all-round knowledge basis" for research, which is essential to achieve better results.

Study design

In February 2023, a survey on digitalisation was distributed at the University of Copenhagen, as part of a longitudinal survey of teachers' practices and beliefs around teaching and technology use in education, which began in 2020. Here, the mission foregrounded in the university strategy paper was to "(…) develop and disseminate the use of digital teaching methods" (UCPH, 2017). To enact this strategy, the university provided teacher training and dedicated support units, focusing both on the pedagogical use of technologies and on the administrative use of digital tools to improve student learning processes, tasks, and outcomes. The third and last author of the paper have been involved in formulating and distributing the survey as part of a project group working under a mandate of the university strategic digitalisation initiative. While the survey was distributed by the management of the university, the teachers were promised anonymity, and the analysis of the data was conducted by a team led by the last author of this paper.

Due to our interest in exploring the relationship between general trends in digitalisation and higher education from a speculative perspective, we included in the last survey nine new questions (of which the last one was open-ended) inviting teachers to co-evaluate a set of futures of the university. We took the future scenarios and materials created by the Centre for Research in Digital Education (University of Edinburgh, 2022) as our starting point and developed eight scenarios relevant to the context of Danish higher education outlined above. In this process, we adapted three scenarios of the original source of inspiration, while we maintained the core focus of five of them. Each scenario was then included in the survey as a prompt that corresponds to a short description (see Table 1).

For each scenario, participants made binary ratings of whether the scenarios were 1) desirable or undesirable, and 2) realistic or unrealistic within the next 10 years. The participants could also choose an "I do not want to respond" option. In addition to the eight scenarios that the participants rated, open-ended responses were elicited by asking in a final question: "If you envision other significant changes to the teaching, you are welcome to elaborate here."

Participants and data collection

Participants were recruited at the University of Copenhagen, Denmark, and included employees with teaching duties in the fall term of 2022. The survey was distributed to 5,949 teachers and teacher assistants who were assigned teaching roles in the fall 2022, of which 915 (15%) replied to the survey. The analyses for this paper are based on 755 participants who responded to the subsection of the survey about future scenarios and 53 responses to the open-ended questions.

The participants worked in various disciplines spanning natural sciences (31.9%), medicine (35.6%), social science (9.9%), law (5.8%) and humanities (14.9%), among others (1.3%). Compared to the overall distribution at the university, we see a slight overrepresentation of teachers from the humanities, and an underrepresentation of teachers from medicine and natural sciences. The participants were 42.3% female, 55.1% male, 0.7% other, and 1.9% chose to not respond. The binary share of men and women is not significantly different from the university overall. Additionally, compared to the general staff,

the respondents are to a higher degree permanently employed (67.8%), tenured employees (61.1% with 10 + years' experience), and to a lesser degree teaching assistants (14%).

Lastly, the survey was administered in Danish and English. Participants could participate in whichever language they preferred. In the Results section, quotes indicated by an asterisk (*) were written in Danish and have been translated to English for presentation.

Quantitative data analysis

In the quantitative data analysis, two of the authors analysed the rating questions to identify patterns in terms of participants' general attitudes towards the described scenarios. To do so, the authors used a two-tailed one-sample proportion test without continuity correction to determine whether the observed participant response differed from a 50% / 50% split to a statistically meaningful degree (correcting the resulting *p*-values for multiple tests). Due to the nature of our survey-items, the authors included responses from participants who did not wish to fill out all the questions. For transparency, the authors also included the share of participants who did not want to reply. To identify patterns across what teachers found realistic and desirable, we correlated (Pearson product-moment) the proportions of desirable and realistic responses between all eight scenarios and tested whether the likelihood of this correlation occurring by chance with a t-test.

Qualitative data analysis

Given the exploratory nature of our study, our qualitative analytical approach followed a coding process based on Grounded Theory (Glaser & Strauss, 1967), which was performed in three iterations. First, codes were developed inductively, which involved three authors reading through the responses and individually generating initial codes from the data set. Next, the authors compared and discussed their coding results, with the support of visual schemes (see one example in Fig. 1 below, from the last author of the paper).

As we had developed very similar codes, the first and second authors of the paper proceeded to review the codes to decide on overall themes and categorise the responses accordingly. In this second iteration, we developed links between the themes as they emerged in the data set. This included a process in which the initial codes were used to link the answers to one/multiple scenario(s). Finally, in the third iteration we interpreted these results through explanatory themes that could relate more consistently the quantitative ratings to the open-ended responses.

Results

RQ1: Which future scenarios do higher education teachers find desirable and realistic in Denmark?

Table 2 below presents each scenario and the percentage of respondents rating the scenario desirable and realistic. We summarise the resulting trends about how teachers imagine the future in terms of desirable, undesirable, realistic, and unrealistic futures.
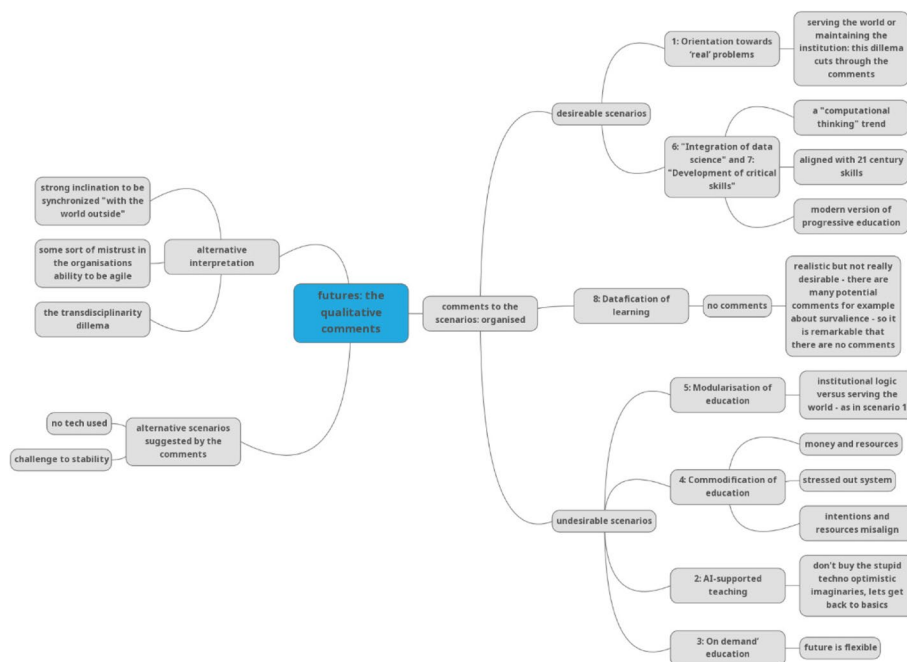
Fig. 1 Mind map visualising the qualitative coding process of one of the authors

Table 2 Percentage of teachers rating each scenario desirable and realistic

#	Scenario	Desirable	Realistic	No Reply
1	**Orientation towards 'real' problems**	63%*	76%*	18%[†]
2	**AI-supported teaching**	32%*	62%*	8%
3	**'On demand' education**	28%*	71%*	13%
4	**Commodification of education**	11%*	53%	12%
5	**Modularisation of education**	36%*	53%	8%
6	**Integration of data science**	87%*	90%*	12%
7	**Development of critical skills**	96%*	77%*	8%
8	**Datafication of learning**	72%*	82%*	16%[†]

[*] *p*-value < .001, which supports rejecting the null hypothesis that the proportion is a 50/50 split

[†] *p*-value < .001, which supports rejecting the null hypothesis that the proportion differs from the average "no reply" rate of 12%

Desirable futures

Regarding the desirability of the scenarios, scenarios 1, 6, 7, and 8 were rated as desirable (proportion test statistics are respectively, $c^2 = 45.73(1)$; $c^2 = 355.24(1)$; $c^2 = 585.83(1)$; $c^2 = 120.70(1)$, Table 2 shows the proportions and significance levels). The two most desirable scenarios prioritise developing students' creativity, problem-solving, and critical thinking (scenario 7, 96% rated it desirable) in a university that incorporates data science into existing disciplines (scenario 6, 87% rated it desirable). The other two scenarios, rated as desirable but to a lesser degree, focus on solving real world problems (scenario 1, 63% rated it desirable) and using data collected from the students' activities on digital platforms to improve teaching (scenario 8, 72% rated it desirable).

Undesirable futures

In contrast, scenarios were rated as undesirable by a majority participants (undesirability is indicated by a low desirable column in Table 2; respectively, $c^2 = 89.47(1)$; $c^2 = 129.78(1)$; $c^2 = 414.47(1)$; $c^2 = 51.30(1)$). These scenarios imagine a future in which teaching is automated (scenario 2, 32% rated it desirable), advanced degrees are replaced with on-demand work-focused short courses (scenario 3, 28% rated it desirable), ultimately rendering education a service in which curricula are replaced by students' choices (scenario 5, 36% rated it desirable). The least desirable scenario is a future which sees the university replaced by private for-profit education (scenario 4, 11% rated it desirable).

Realistic and divided futures

In rating whether scenarios were realistic or not, all the scenarios—except 4 and 5 ($c^2 = 1.88(1)$, 95% CI [49%,56%]; $c^2 = 1.96(1)$, 95% CI [49%,57%])—were rated as realistic by the majority of the university teachers (respectively, $c^2 = 176.51(1)$; $c^2 = 43.19(1)$, $c^2 = 116.04(1)$; $c^2 = 419.84(1)$; $c^2 = 206.08(1)$; $c^2 = 247.05(1)$). The respondents were divided regarding how realistic it is that the university could be completely restructured, allowing students to build their own courses of studies (scenario 5, 53% rated realistic) and compete with private education by becoming a commodity (scenario 4, 54% rated realistic)—we label these divided futures. None of the scenarios was rated as unrealistic by the majority of the respondents.

Contentious futures

Table 2 shows the proportion of teachers that selected "I choose not to respond" for each future in the *No Reply* column, which varied between 8 and 18%. This was an active response option, rather than just leaving the question blank. Scenarios 1 (16% chose not to respond) and 8 (18% chose not to respond) were above the average not responding rate (M = 0.12; $c^2 = 15.02(1)$; $c^2 = 13.52(1)$), this suggests that giving rating these scenarios may be contentious for the respondents, although they are considered desirable futures by the majority.

Overall trends

Overall, four scenarios were rated as desirable and four were rated as undesirable. Six scenarios were rated as realistic, and none were rated as unrealistic. For two scenarios, responses were undecided in terms of how realistic the scenarios were. There was a strong positive correlation between the proportion of respondents rating scenarios as desirable and realistic, as shown in Fig. 2, in which each scenario is plotted in terms of how realistic and desirable it was rated ($r = 0.84$, $t = 3.75(6)$, 95% CI [0.32,0.96], $p < 0.01$). Figure 2 shows that, in general, the more desirable futures are also rated as more realistic.

RQ2: How do individual teachers interpret and position themselves within the proposed scenarios?

In the following, we present six main themes identified in the qualitative data. The themes comprise different orientations underpinning teachers' perspectives on future
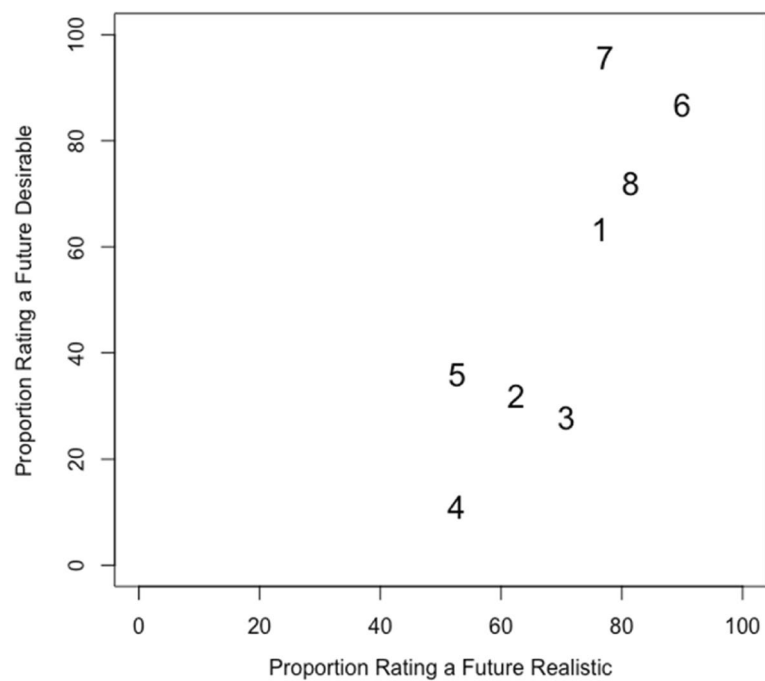
Fig. 2 Correlation between desirable and realistic future scenarios

higher education and factors driving these futures. The themes reaching the highest number of coded texts are: 1. Maintain our mission to educate new generations, 2. Inspiring teachers, inspired students, and 3. Arguable demands. The themes appearing in the lowest number of open-ended answers are 1. Hybrid borders, 2. Not sitting on an academic pedestal, and 3. Disruption of practice. Table 3 presents an overview of the main themes and subthemes, and the distribution of themes within the dataset. Among the subthemes, we underline in italic the ones that relate more specifically to the foreseen role of technologies in higher education. The main themes are unfolded in detail and with examples in the following.

Maintain our mission to educate new generations

This theme is defined by a focus on research at the core of education. Teachers expressing this focus connect research to the mission of the university. As stated by a teacher:

> *Regarding that the teaching will be more about "real problems", I fear to a great extent that this will be at the expense of the absolutely necessary theoretical and meta-theoretical foundation that you need to understand a so-called "real problem". There is a tendency for theory and scientific theory to be underprioritised. (Quote 21*)*

Further, a research-based approach offers a valuable critical approach to emergent phenomena in the world, such as digitisation and AI. This is also understood as an important part of maintaining the educational mission of the university. Some examples are listed below:

Table 3 Overview of coded themes

Main themes and subthemes	Description
Maintain our mission to educate new generations (*n* = 15)	
A research-based approach to the world	Interest in critical and research-based approaches to problems in the world
The mission of higher education	In defence of academic practices and values. Concerns for deterioration of academia, higher education differs from schools with an applied perspective
Lifelong learning	Higher education offers foundational knowledge as a stepping stone for lifelong learning
Erosion of professional identities	Concerns for loss of a strong professional identity
A critical approach to technology	*Interest in approaching technology such as AI from a critical perspective but without rejecting them per-se*
Inspiring teachers, inspired students (*n* = 12)	
Student learning	Concerns about low quality student learning and engagement
Quality teaching	Interest in old-fashion teaching which is of high quality
Time	Concerns about having limited time to do quality teaching
Automatisation	*Concerns for automatisation of teaching and learning*
Limitation of digital technologies	*Concerns about the role of digital technologies/devices and suggestion for digital degrowth*
Arguable demands (*n* = 12)	
Corporate influence	Concerns for the influence of corporate companies
Financial cuts	Concerns for the government's management of universities
Modules of knowledge	Concerns for modularisation of education
Buyers' market	Universities are presented as offering services, and students as buyers
Well-being	Concerns for students and teachers' well-being and level of stress
Hybrid borders (*n* = 6)	
Benefits beyond cognitive knowledge	Statements of the university as a place of identity formation and embodied encounters, beyond knowledge (with students in mind)
Interdisciplinarity	Interest in expansion of disciplinary practices and knowledge through the integration of other disciplines
Internationalisation	Statements that present the university as (becoming) a global institution
Diversity	Inclusion of student diversity
Not sitting on an academic pedestal (*n* = 4)	
An applied approach to education	In favour of presenting real-world problems to students and assessing students' ability to apply what they have learned
Disruption of practice (*n* = 4)	
Digital technologies as disrupters	*Statements of the ways that digital technologies and applications might disrupt existing practices*
Revisiting core elements of teaching and learning	Statements expressing a desire for modifying core educational elements such as examination practices

Incorporating a more historical and critical approach to technology in general courses on methodology or the history and theory of science within different fields will be crucial if we are to maintain our mission to educate new generations and to maintain the university as the primary site for this education. (Quote 11)

Digitization is not a yes/no question. Some digitization is good, some is inevitable, no one takes a position on the ethical aspects of it, nor on the health and social consequences of it. We must be aware of the consequences this has for the education and the students' social skills etc. before we blindly follow the "flow" of digitalisation. (Quote 35*)

This approach also comprises giving value to solid disciplinary knowledge. Alternatives such as having to integrate several knowledge fields are seen to disrupt the purpose of higher education. As one teacher expresses:

> *Interdisciplinarity is going to dilute professionalism. Courses are becoming more generic rather than specialist. It will ultimately erode the purpose of the university. (Quote 17*).*

Finally, the theme includes perspectives that depict research-focused academic degrees as foundational for lifelong learning:

> *There will be plenty of courses outside the university to learn people soft skills and update people on equipment and techniques. But the hard skills and time to form oneself should be kept as the core of the university. (Quote 38)*

Inspiring teachers, inspired students

This theme comprises statements in which teachers express concerns for situations involving a decline in student learning and engagement. Some teachers blame students' study culture. Others focus on the influence of external structures and initiatives hindering quality teaching such as limited time to prepare teaching, financial cuts and digitalisation:

> *I believe, there are a lot of great research and intentions on creating better educational systems. But if the resources are constantly being cut, I don't think the students will benefit from all the good intentions. (Quote 15)*

Propositions to limit digital devices in teaching and learning to improve student learning and social connects are also put forward. As suggested by a teacher:

> *Forbid use of computer during lectures and in class! It's been forbidden in high-scale universities out of common sense, as the tools minimise students' intake of curriculum and ignores the tactile stimulation between writing in hand and learning. (Quote 13)*

Following the same line of thought:

> *Another big issue will be whether we can at all be allowed to keep the class free from digital devices and internet access once in a while. It would be a great educational gain and a great human gain if we taught the students to be concentrated and attentive and not to be dependent on internet access as a comforting teddy bear. (Quote 27*)*

Issues of student learning and dependency on technology are supplemented by issues of legal rights and questions of who owns the digital material developed by teachers. Ultimately, some suggest returning to old-fashioned teaching which will allow for better achievements in student learning:

> *I believe that a key element in teaching students for the next 10 years still is the old-fashioned lecture with well-prepared slides and well-prepared comments by an inspiring teacher. (Quote 16)*

Arguable demands

Another understanding of education portrays concern for external demands. Teachers are concerned with the prospect of a buyer's market based on needs that are not justified. As stated here:

> *A demand culture that is difficult to meet - students will demand something from teachers, without necessarily having the basis to evaluate if what they demand is the optimal/needed way of learning. (Quote 43)*

Others critique local management practices of presenting academic staff with demands that are not supported in practice. As expressed by one teacher:

> *There is a fundamental gap between the ambitions and rhetoric of the university's senior leadership and the realities. My Faculty, e.g., encourages me to structure courses as part of their post-graduate program but then completely fails to invest any energy into actually branding them. (Quote 22)*

Finally, teachers question the underpinning truth of the demands put forward. In particular, some statements indicate that the increasing demands for online courses and activities overlook the value of the university as a physical place:

> *The strength of the University will increasingly be the study environment and physical proximity. As online courses and resources increase and improve what University can offer in terms of a 'place' to study will naturally be more important. As politicians try to ensure social cohesion the University will be asked to attract a true diversity of students and there will have to be 'room' for people. Online will not be able to fulfil our basic needs to be together. (Quote 54)*

A pool of statements concerns the way external demands, such as governmental reforms, influence teachers' and students' well-being:

> *I imagine: Reform in the university area which entails savings and redundancies. This leads to an increasing degree of pressure on teaching, more people collapse due to stress, which causes chaos for course completion and increased pressure on the remaining lecturers. All this will impair the education. (Quote 33*)*

> *Stress and bureaucracy will just increase and increase, and quality and job satisfaction will steadily decrease. (Quote 18*)*

> *(T)here should look at the balance etc. the requirements for the teacher and the requirements for the students in relation to what is provided) I think both a well-being and social problem. (Quote 42*)*

The statements make clear that teachers see universities as places for work and study, regulated by norms, practices and structures that might overlook human needs. Some teachers fear that low levels of well-being will lead to low-quality teaching at Danish Universities and increasing number of skilled students with degrees from international universities. Others depict a division of students into very skilled and less skilled, reflected in the course offerings:

Employers will notice soon that our smartest graduates are less skilled, disciplined and independent, and there will be a reckoning. The consequence might be that we'll create "honors" programs and classes for the best 25% of students, and the rest of the students will take the "normal" (=the current, dumbed down) classes. (Quote 25)

Hybrid borders

The theme illustrates an orientation towards new ways of teaching and working. This involves expectations towards working in a global community and working globally from home:

Presumably we will draw more on foreign colleagues for especially MSc courses who can teach online – and we will do the same, just with the opposite sign. (Quote 23*)

Working across disciplinary borders:

Hopefully the human sciences will also be integrated into other disciplines - more interdisciplinary please! And in all faculties. (Quote 4*)

Having flexibility in time and space:

I believe that the future will be flexible in relation to meeting times, meeting places (online/physical) and no homework. (Quote 24*)

As well as having students from different geographical locations or carrier levels meet to benefit from each other:

That the teaching of young students and externs on continuing education took place at the same time, so that they could benefit from each other. (Quote 45*)

The possibility of connecting with other students around the globe is open via digital platforms. So students from Denmark sitting somewhere nice discussing in a cross-disciplinary way issues like (depression or co2 emissions cost-effective approaches or water quality or halting extinction) and connecting with students from India, Brazil, US... that could be so cool. :-). (Quote 49)

Not sitting on an academic pedestal

Statements in this category involve a gaze firmly locked on proving the value of education to the world:

We will have to show the outside world that we are not sitting on an academic pedestal, but that we exist in the same world as everyone else, and that we want to lift up as a group, but with sharpened skills, against the big problems we are in the middle of in, as well as looking into. (Quote 40*)

Thus, another aspect is to contribute to solve emergent problems in the world. As stated by a teacher (quote 6): "We need students who can reflect and systematize in the real world, not isolated from the world in an academic pocket".

Disruption of practice

A few statements illustrate that some teachers long for a disruption of academic norms and practices. Here, digital technologies and applications might play an important role with facilitating such disruption:

I hope digital tools can disrupt and challenge existing (often stale) teaching methods. But I doubt it. We will probably just be teaching in the same boring manner as now 20 years from now. (Quote 51)

ChatGPT and similar easy-to-use AI technologies will be unavoidable and should hence be incorporated in teaching and exams instead of discouraged. Will require new approaches to exercises/homework and exams, e.g. let ChatGPT answer a query and write an essay about why its answer is insufficient/plain/tedious etc. Will be a big help for short cutting students' coding skills, i.e. as a quick way to get scripts for plotting that are otherwise time-consuming and not part of the core curriculum. (Quote 19)

Others talk in general terms of revisiting core educational components such as examination forms that are perceived to be "extremely bad at assessing what a student has learned, some people do extremely poorly in such situations regardless of how much they actually know about the material." (Quote 47*)

Overall, the first three themes illustrate that the teachers interpret higher education as a place for foundational knowledge and critical approaches to emergent phenomena in the world, underpinned by research practices and thinking. As practitioners, teachers are concerned with demands hindering favourable teaching practices and manifestations of low-quality learning. The following three themes are shaped by an orientation towards expanding and disrupting higher education. The statements make clear that the institution and its focus are on a state of flux, moving beyond a homogeneous knowledge-based group of people and solutions towards a future which is fundamentally uncertain.

Discussion

Which future scenarios do higher education teachers find desirable and realistic in Denmark?

Four out of eight future scenarios seemed to be desirable: Orientation towards 'real' problems (1), integration of data science (6), development of critical skills (7) and datafication of learning (8). Six scenarios were rated as realistic, and none were rated as unrealistic. By contrasting what the respondents desire and hope for with what they find realistic, our study shows that the most desirable futures are the ones that are also deemed most realistic: developing critical thinking, understanding better the functioning of digital tools and technologies that occupy the learning environment, defending the active role of the university in contributing to improving society. On the other hand, the most dreadful scenarios are not considered realistic by most respondents. In spite of a political context that shows that the modularisation of learning and the commodification of higher education are concrete and *real* possibilities, some teachers contend the

possibility of these scenarios becoming the future of the university. We interpret this as some teachers use the survey to communicate their opinion to the management. They stand for what they refute.

Our study shows that there is a clear resonance between national and global issues, which is reflected in the concerns expressed by Danish teachers when asked about future imaginaries. However, besides the concerns, the participants also mentioned a few alternatives to the mainstream narratives, which emerges not only from the qualitative analysis but also from the quantitative analysis.

How do individual teachers interpret and position themselves within the proposed scenarios?

The teachers express three main clusters of concern about the current situation and the future imaginaries of the Danish university: (1) maintaining the mandate of the university, (2) negotiating boundaries and (3) dealing with digitalisation. We will start with maintaining the mandate of the university, conceptualised as the past-present-future continuum.

Past-present-future continuum

A first concern expressed by the participants is how to maintain the mandate of the university in a setting of economic pressure, political turbulence, and public education reforms. The demands in terms of teaching workload, administrative tasks, and measures of impact, according to global criteria of excellence, are considered unattainable by the teachers, who would rather focus on preparing inspiring lessons and improving teaching quality. This issue is sometimes coupled with a conservative reaction, with comments pointing to the need to re-establish the identity of the university, in a continuum from the past – when higher education was considered the *locus* of knowledge – and towards a future that does *not* include perspectives such as the commodification of education (*Undesirable future 4)*, modularisation (*Undesirable future 5)*, or education 'on demand' (*Undesirable future 3)*. In some cases, this search for identity gives rise to radical positions in the open-ended answers, with teachers claiming the need to divide disciplines more clearly (e.g. against inter-disciplinarity) and/or to return to the ivory tour model of a university isolated from society.

Negotiation of boundaries

A second theme concern emerging from the data has to do with the boundaries of the university, both in material and metaphorical terms. There are many sub-themes that can be traced within this topic. First, academic values are discussed when the relationship between the university and the market is present and visible. Some comments stress the need for the university to innovate or even disrupt the practices in place. This is suggested to happen in the future as a possible consequence of (1) the reliability of teaching on digital technology and (2) the connection with local companies that could be beneficial for the students who wish to test their practical skills. The quantitative analysis complements this qualitative result, by identifying two *Contentious futures*, respectively *1 – orientation toward 'real-world' problems* and *8 – datafication of learning*. These results show how the participants are conflicted on the meaning and implications of allowing

companies and technologies 'inside' and of extending the university influence 'outside' in society. The participants seem to wonder: should we let the university steer the curriculum or should we see what the companies have to offer in a positive key? Should we let the data extraction be essential for control over university strategic decisions?

Another aspect that more closely refers to concrete boundaries is the focus on fluid workflows and hybrid environments of the post-pandemic university. The participants stress the efficiency of online meetings for administrative and even research purposes, but they maintain that teaching and student groupwork should be done in presence. These answers are reflected in the fact that *scenario 2 – AI-supported teaching* is seen as an *Undesirable future.*

Finally, a theme that refers to boundaries in a broader perspective is the one that situates the institution within an international landscape of global knowledge. Will modularisation of the university incentivise Danish students to collect modules, instead of diplomas? Will the students choose to attend online courses from globally recognised universities rather than in Denmark? The fact that *scenario 5* is among the *Undesirable futures* but nonetheless considered realistic by many respondents is a clear mirror of the worries expressed in the open question.

Digitalisation

This brings us to the third concern. When asked to position themselves about desirable scenarios related to the role of technologies, the respondents stressed the need for a broad understanding of digital literacy at university, which would include data science across the disciplines (*Desirable future 6 – integration of data science*) and a higher level of critical thinking about technology in education and in society (*Desirable future 7 – development of critical skills*). In this view, the development of students' critical skills must be preserved as the most important outcome of teaching, especially considering the increasing presence of AI and automation-supported learning tools. In this line of thought, the most desirable future is one that sees the students as being able to contribute to real-world problems (*Desirable and Contentious future 1 – orientation toward 'real' problems*), with both technical and knowledge-based skills.

On the other hand, in the open-ended answers the participants expressed their concerns about the role of digital tools that support learning/collect data and of which they are not in control (*Undesirable future 2 – AI-supported teaching; Desirable and Contentious future 8 – datafication of learning*). Some respondents suggest limiting the use of digital screens in teaching and at exams, to guarantee more quality in students' learning. This perspective goes somehow in parallel with the idea that engaged teachers, who can deliver a good lecture and are attentive to students' improvements, are still the pivotal element of quality in higher education. However, the teachers cannot always provide good teaching. They feel under pressure between political reforms and trends of the market (*Undesirable futures 5 – modularisation of education, and 3 – 'on demand' education*). This is evident in both the quantitative data analysis that lists commodification of education (*Undesirable future 4 – commodification of education*) as the least desirable scenario, and in the qualitative data analysis, where the respondents express their struggle with 'a demand culture that is difficult to meet' coupled with political reforms based

on cuts and savings, with the result that 'more people collapse due to stress' and 'bureaucracy will increase and increase'.

In many open-ended answers, these concerns take the form of worries about a sociotechnical future where the mission of the university is at risk. A mission framed by university teachers as a research-based approach to the world, which is inevitably different from professional and vocational higher education and from applied studies. A mission that still involves educating new generations in a lifelong perspective, as well as contributing to society not from a pedestal but addressing the problems of our time.

To sum up, the respondents show distrust in the institutional ability to solve urgent dilemmas – that is, to manage the tensions between private companies and the public sector, to define the boundaries between physical and hybrid settings, and to provide answers to conflicting requirements at the local and the global levels. In line with recent research studies across Europe (Boehm, 2022; Veiga & Seidenschnur 2022), our participants have questioned the loss of autonomy in academia, the declining quality of work conditions, and the unattainable demands that they are constantly facing (Wright & Zitnansky, 2023). In search for answers, some have even suggested that we should step back from technology, in a sort of digital degrowth perspective (Selwyn, 2023), or that the university should go back to an ivory tower where disciplines do not converse with each other.

On the other hand, the participants also expressed their willingness to reclaim their agency in re-imagining the university role in society in a broader perspective (Nøhr et al., 2023). They describe teaching as their closest space of agency, where they can pursue critical thinking, be of inspiration for the students, and push back towards AI-supported unintelligible processes and uncontrolled datafication of learning. They question what digital technologies are *doing* to our universities (Alirezabeigi et al., 2020), expressing their ability to address complex problems. In society, they see themselves as contributing to finding solutions for real problems, which is restated as the core element for the identity of higher education. Finally, the teachers also claim agency when they ask for a higher level of participation in political and institutional decisions for the futures scenarios of the university, giving a clear message to the management that participation in surveys is not a sufficient level of involvement in decision-making processes. In terms of power and equity, the study paves the way for further research into how to realise the futures they imagine.

Limitations and methodological considerations

In this section, we reflect on both the limitations and methodological affordances created by translating speculative methods into a survey-based study.

First, regarding the interpretation and relevance of these future scenarios in a Danish context, this study lacks in-depth details about how the participants made sense of the scenarios and whether these scenarios adequately encapsulate the future imaginaries held by Danish university teachers. We attempted to address this limitation in two ways: 1) we adapted the scenarios developed in the UK (University of Edinburgh, 2022) to Denmark based on our prior knowledge and research experience; 2) we included an open-ended response option to capture both how the participants interpreted and added to the scenarios we presented—which only a small proportion of the respondents used.

Second, regarding the participants' positioning and perceptions in response to the tool used to collect data, the survey in this study was distributed by university management. Thus, the responses could be interpreted as a way the teachers found to position themselves strategically in relation to the current debates at the institution, including about ongoing political and administrative reforms. In fact, over the multiple distributions of the survey to teachers, it was evident that some teachers interpreted the survey as a communication channel to the Dean of Education, which was sometimes addressed directly in the open answers. This situates the imaginaries in a political context, important for how we can interpret both the quantitative response patterns and the open-ended comments.

Finally, this study highlights more general methodological considerations regarding how our study differs from qualitative speculative futures research. Our mixed-methods approach is limiting in terms of *generation* in speculative research. Typically, speculative research favours methods such as role-playing, co-design, and interviews to create spaces for in-depth dialogue, debate, critical engagement, and participation. This was also commented by one participant in the open answers to the survey, stating "I think we need to discuss the challenges together and not just in questionnaires." We agree with this participant and recognise the need for future work at our institution to create a space of imagination and creative experimentation to live up to the transformative potential envisioned by speculative methods. In comparison, we find that our focus on characterising responses to primarily pre-constructed futures is a more closed format than the above-mentioned methods. Despite its limitations in *generation*, this study provides insight into connections and patterns between different imaginaries of the futures, potentially opening a discussion of alternatives based on a more levelled foundation, where the broad reception of futures can be taken into account. Lastly, by using a survey method, we studied a wide group of academic staff, encouraging speculative research to test the meaning and presences of imaginaries across contexts and move towards issues of power and agency associated with specific futures.

Concluding remarks and implications for the future

The present study set out to disclose Danish university teachers' engagement with speculative educational futures derived from global trends and national reforms. By deliberately submitting these trends to teachers, we hope to have given voice to a group of stakeholders rarely invited to evaluate emerging futures. Instead of exploring a small number of teachers' engagement with emerging futures through in-depth research methods, we wanted to survey the meaning attributed to global and national imaginaries by teachers themselves (desirability) and the presence of these in the Danish context (realisation) among a broad group of faculty members.

It is perhaps unsurprising that it is difficult to extract one clear-cut suggestion from our study to improve future education. Perhaps one of the most fruitful suggestions is to undertake similar studies at other higher education institutions to create arenas for larger collegial discussions around the future of the university. In our case, the data reports (mainly obtaining aggregated descriptive statistics) describing teachers' responses have been published on the university intranet and made accessible by all employees and students. Several actors at the university have shown interest in these

data, leading, among others, to the cross-institutional and cross-disciplinary collaboration on this paper. Additionally, the third and final author of this paper have used the data as a steppingstone for a discussion of educational presents and futures with the strategic digitalisation committee chaired by the pro-rector of the university.

There is clearly a need to challenge and test hypothetical relations between societal trends and universities, and educational imaginaries and academic staff. Such knowledge qualifies strategic work undertaken at universities and helps identify constraints and solutions within an academic environment (Suoranta & Teräs, 2023). On the basis of our study and as highlighted in the prior section, we might conclude that co-evaluative approaches (Krogstrup & Mortensen, 2021) can serve as a knowledge basic for university management. In other words, it provides a useful "temperature check" and helps us plan for emerging futures and pose important questions about academic staff and their engagement with education and how this affects their engagement with societal trends.

In dialogue with global trends and challenges faced by higher education worldwide, it is clear from our findings that imaginaries about educational futures are never neutral but carry structures of values and power. These results urge higher education institutions to develop their capacity for manoeuvring educational disruptions and to disincentivise the realisation of futures that are deemed less desirable by most teachers. At the same time, the findings suggest for institutions to critically assess the work environment for teaching offered to academic staff, as well-being is strongly challenged by the current conditions. We conclude by affirming the need for further research to explore how imaginaries are viewed differently by different subgroups at the university and in different disciplinary fields, as a way to address the justice in who gets to envision the future at the university.

Declarations

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