Higher Education
https://doi.org/10.1007/s10734-024-01256-4

Waiting for the revolution: how higher education institutions initially responded to ChatGPT

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Accepted: 21 June 2024

Abstract
Although debates regarding the integration of digital technologies in higher education are far from new, the launch of ChatGPT in November 2022 was considered by many as something different from the developments that had come before. This article explores how higher education institutions make sense of the potentiality inherent in artificial intelligence and the early responses to the proliferation of ChatGPT. Through a qualitative interview-based study carried out at three HEIs in Norway, and applying Scott's (2005) three pillars of institutions as an analytical framework, the article examines the type of change pressure ChatGPT was perceived to represent in the period following its launch and the type of organizational response this perception warranted. The findings show that while it was expected that ChatGPT and related technologies not only could threaten — and potentially challenge — key norms and values in the long run, in the short term it was primarily perceived as a regulatory issue that needed to be controlled by higher education institutions. The article points to an epistemic and temporal imbalance in both the expectations and response to ChatGPT, coupled with a lack of technological competence to fully consider the kind of transformation that artificial intelligence technology potentially represents. Coupled with the sense of artificial intelligence being a "moving target", this led higher education institutions to an initial state of organizational paralysis, in turn adopting a "wait and see" strategy.

Keywords Artificial intelligence · ChatGPT · Digitalisation · Higher education · Sensemaking · Organisational response

Introduction

The relevant and appropriate use of digital technology is by no means a new debate in higher education. Expectations concerning online education and the use of various digital tools have consistently obtained attention, associated with paradigmatic changes (Harasim,

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Published online: 03 July 2024

2000) and vast unused transformative potential (Garrison & Kanuka, 2004). Some of these debates concern developments that can largely be seen as supplementary (e.g. online learning, MOOCs), whereas others suggest a fundamental transformation of higher education. However, while expectations and claims of disruption and transformation have been plentiful, higher education as an institution has been remarkably durable in the face of such challenges[1].

The launch of ChatGPT in November 2022 has by many been seen as something different. A variant of OpenAI's Generative Pretrained Transformer (GPT) language model, ChatGPT is designed with the purpose of generating text indistinguishable from that written by humans (Rudolph et al., 2023). Lauded as heralding the "death" of the student essay (Marche, 2022) or, even more dramatically, possibly leading to the "end of education as we know it" (Williamson, 2023), both scholars, journalists and others have been vocal regarding the fundamental impact that artificial intelligence (AI) technology will have on teaching and assessment practices. Whereas some accounts of AI technology have seen it as something positive or transformative in nature (see e.g. Cheng, 2017; Marshall, 1986; Shibani et al., 2020), many have adopted a more negative, dystopian view (see e.g. Carson, 2019; Williamson et al., 2020). What all these accounts have in common, however, is the expectation that recent developments in artificial intelligence will lead to a transformation of higher education, necessitating an organized, systematic and imperative response from higher education institutions (HEIs) (Bearman et al., 2022).

Whereas previous instances of technological change — for example the shift seen during the covid-19 pandemic towards "emergency remote teaching" — have largely led to a replacement or mimicking of traditional educational practices, the introduction of ChatGPT appears to represent something new. At present, HEIs are having to respond not only to an extremely abrupt but also, for most institutions, a vastly unfamiliar technological development. This makes the introduction of ChatGPT in November 2022 a fruitful case from which to examine more general questions regarding how HEIs respond to rapid and unfamiliar technological change.

The purpose of this paper is to explore these issues, by answering the following research question: *how did HEIs view and respond to the emergence of ChatGPT and other LLMs concerning their educational tasks?* We employ Scott's (2005) three pillars of institutions as our analytical framework to examine the type of change pressure ChatGPT was perceived to represent in the period following its launch and the type of organizational response this perception warranted. As such, we are particularly interested in the measures the HEIs adopted immediately following the launch of ChatGPT and their reflections regarding their appropriateness. Understanding these initial views and responses is important, as they will ultimately have laid the foundation for the subsequent decisions being made regarding the regulation of ChatGPT and related technologies — both at the local HEI and national level. With this in mind, the empirical scope for this analysis is how Norwegian higher education institutions viewed, responded to and made sense of ChatGPT in the initial period after its launch in November 2022 until spring 2023.

[1] Consider, for example, the expectations related to the introduction of MOOCs and the consequent labels of "bubble" and "fad" it obtained.

ChatGPT and artificial intelligence in higher education

AI does not describe a single technology but is an umbrella term referring to "computers which perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving" (Baker & Smith, 2019, p. 10). Although perceived by many in higher education and elsewhere as a new development, chatbots build on extensive AI technology and research going back decades. Already in the 1980s, Marshall (1986, p. 205) advocated the relevance of AI technology for higher education, arguing how "Intelligent Computer-Assisted Instruction" allows 'the student [to be] involved actively in generating his [sic] knowledge base'…". Despite calls to take AI into use, widespread examples of HEIs using AI in their educational tasks have until recently been scarce. In general, digitalisation efforts in higher education have been described as laggard, even after the experiences with emergency remote teaching during the covid-19 pandemic (Flobakk-Sitter & Fossum, 2024). The launch of ChatGPT has, to a large extent, revitalised this discussion.

ChatGPT is, at this point, likely to be the most widely known example of AI technology.[2] More specifically, ChatGPT and its relatives are based on LLM (Large Language Model) technology, described by Rudolph et al. (2023, p. 344) as "an artificial intelligence-based software application which can engage in human-like conversations". LLMs are a subset of generative AI, referring to machine learning algorithms that have been designed to produce new data based on extensive training. This may include text, images, sound, and other kinds of data. LLMs are able to "learn patters and relationships in the language and to generate new text that is similar to the text it has been trained on" (Rudolph et al., 2023, p. 350). This makes them suited to generating text appropriate for a given purpose based on prompts, and the text appears as relevant and similar to what humans would produce given a similar prompt.

AI technology may be used to further personalise adaptive learning, for example through intelligent tutoring systems (ITS) (Zawacki-Richter et al., 2019). Furthermore, it may enable the reduction of academic staffs' workload, by automating assessment and personalised feedback mechanisms (Baker & Smith, 2019). It may also be of relevance for HEIs' administrative tasks (Baker & Smith, 2019). As such, LLMs and generative AI more broadly may be integrated into different tools employed in higher education. What is particular by ChatGPT is that it has significantly improved the quality of text produced compared to pre-existing tools. Unlike other tools and software which may have incorporated elements of generative AI, it is also widely accessible to students and HEI staff alike.

As ChatGPT was only launched in November 2022, the existing literature addressing the consequences of this specific technology for higher education is still limited, especially when looking for studies that examine how HEIs are reflecting on and responding to the change.[3] The majority of articles published thus far either take the form of

[2] ChatGPT is by no means one of its kind. Since the launch of ChatGPT by OpenAI and Microsoft, and at the time of writing this article, most major tech companies were working on developing their models.

[3] The following search was carried out in Web of Science 15.12.23: ((TI=(ChatGPT)) OR AB=(chatgpt)) AND AB=("higher education"), generating a total of 58 results. A similar search carried out in Google Scholar, reveal additional articles published as working papers and presumably under academic review. It is reasonable to assume a significant number of academic papers on this topic are currently under review, and will be published in due course.

autoethnographic studies, narrating the authors' experiences with and reflections on ChatGPT (see e.g. Iskender, 2023; Stojanov, 2023), or they focus on the impacts of ChatGPT on academic integrity and the assessments of students (see e.g. Cotton et al., 2023; Crawford et al., 2023; Currie et al., 2023; Perkins, 2023; Rudolph et al., 2023). Few of the articles published thus far focus on how HEIs view the advent of ChatGPT, their response — if any — to this development, and the way in which ChatGPT and related technologies have the potential to transform HEIs more generally. These are themes we specifically want to address in this article.

HEIs and (potentially) disruptive change

Our theoretical reasoning in this article stems from a neo-institutionalist line of thinking. We utilize Scott's (2005) view of institutions as comprising of three analytical elements — hereafter referred to as 'pillars'. We use this as a framework to specify various aspects of educational provision as an institutionalised practice and how the three pillars allow for different explanations of how ChatGPT may challenge current institutionalized practices. This distinction also forms a basis for discussing perceptions of ChatGPT and how these interpretations are related to the initial responses that emerged during the six months immediately following the public launch of the LLM. At this point, it is still rather unclear what kind of change to higher education ChatGPT is perceived to be. While some of the public debate has been both apocalyptic and utopian, what matters for HEIs' behaviour is how the emergence of ChatGPT and related technologies are perceived locally, and how such perceptions are linked to specific organizational action.

A starting point for this argument is that HEIs are organisations where education represents a highly institutionalised task. If we follow March and Olsen's (1989) definitions of institutions, institutions compose of organized practices, relatively durable social structures, role division, symbolic elements and routinised access to resources. While the specific organization of educational delivery may vary between countries and HEIs, the basic architecture of education as a practice is reasonably well established. A consequence of this is that abrupt, comprehensive and widespread change in educational delivery is less likely. Indeed, the overall educational function of universities has been reasonably resilient, and universities remain recognisable institutions (see also e.g. Kerr, 1982). This does not mean that change never takes place or that digital technology has had no effect on higher education. However, while considerable innovation and change may occur among individual academic champions locally, these often remain localised rather than representing broader institutional changes (Kirkup & Kirkwood, 2005).

From an institutionalist perspective, when legitimacy is at stake, HEIs may opt to comply with expectations to provide more digital education. However, the result of such compliance may also be decoupling from core processes, implying that the influence of such changes on work processes (including education) would remain limited (Meyer & Rowan, 1977). As an example, this can lead to surface claims of success — for example by institutions focusing on reporting on their digital infrastructure as an indicator of success in digitalizing education — rather than a genuine transformation of teaching and learning practices. An open question is then whether the proliferation of AI in society could provide a more substantive external shock that would shake the institutional foundations of higher education.

In our analysis, we take a point of departure in Scott's (2005) notions of three pillars when unpacking potential change in institutionalized practices. The *regulative pillar*

underlines that institutions have a regulative dimension where rule-setting, monitoring and sanctions are essential activities. Rule systems are characterized by a high degree of obligation, precision and delegation to apply the rules to assure compliance. The *normative pillar* focuses on institutions, including values and norms, with values being "the preferred or the desirable" and how this might be assessed, and norms being "how things should be done, (…and) legitimate means to pursue valued ends" (Scott, 2005, p. 64). Norms and values determine prescriptions for behaviour, where a key driver is appropriateness. Finally, the *cultural-cognitive* pillar emphasizes the taken-for-granted elements and shared conceptions of reality. In other words, how cultural frameworks are being interpreted locally in a nested form (Scott, 2005).

From this conceptualization, one could also conceive of a distinction between how external change pressures are perceived and subsequently responded to. For example, a shock that is primarily perceived to affect the regulatory dimension, would imply the introduction of new formal rules and sanctions to regulate behaviour. In the context of ChatGPT, if the technology is primarily viewed as a tool for enabling cheating at exams as students use ChatGPT to generate student essays, a way to address ChatGPT would be to create clear rules regulating when it can and cannot be used. Similarly, if ChatGPT is primarily perceived as a shock to the normative dimension, for example by challenging what are considered relevant exam forms, relevant steps to take would be to establish a new consensus regarding what exams and assessments ought to achieve. If, however, a threat is perceived to challenge the cultural-cognitive dimension, this would to a larger extent also question the taken-for-granted elements of educational provision. These may include the shared understanding of what it means to provide higher education, or more general cultural beliefs about technology use that would also penetrate institutional practices.

Thus, when ChatGPT is presented as a new and potentially transformative development, the way in which one may respond to it, is likely also related to how this threat is being interpreted locally. What this entails is also that the change pressure on the different pillars may vary and is dependent on how institutional actors make sense of this new technology.

Data and methods

The analysis builds on a qualitative interview-based study carried out at three HEIs in Norway during spring 2023. The selected institutions represented a most-different-case selection principle, varying in terms of their age and profile (traditional research university versus more professionally oriented institutions, and single versus multi-campus institutions). The study consisted of a document study and individual semi-structured interviews with a total of 17 key stakeholders. These include persons in senior leadership roles (3), representatives from HEI administration (including IT) (7) and academic development units (5), and academic staff involved in strategic decisions about the use of digital technology at their institution (2). These respondents were selected in the capacity of the role that they inhibit in the respective HEIs; they were all individuals who held a core position of advising on, or making decisions about, how the institution should address digital technology. As such, they are particularly information-rich respondents who have special insights into the inner life of their institution.

Data collection followed established ethical procedures for qualitative research. The study was reported to the Norwegian Social Science Data Services before the start of the data gathering process, and the participants gave informed consent to participate after

Table 1 Overview of respondents (role and institution)

Higher education institution 1:	Higher education institution 2:	Higher education institution 3:
1. Institutional leadership (1a)	8. Institutional leadership (2a)	12. Institutional leadership (3a)
2. Administrative staff (1b)	9. Administrative staff (2b)	13. Administrative staff (3b)
3. Academic development unit staff (1c)	10. Academic development unit representative (2c)	14. Academic development unit staff (3c)
4. Academic development unit staff (1d)	11. Technical staff (2d)	15. Technical staff (3d)
5. Academic development unit staff (1e)		16. Technical staff (3e)
6. Academic staff (1f)		17. Technical staff (3f)
7. Academic staff (1g)		

receiving information about the study. They also had the option to withdraw their consent at any point, without giving reason. All interviews were audiotaped, transcribed verbatim, and subsequently anonymised (Table 1).

The interviews included specific questions on ChatGPT and how the institution had responded to those, as well as broader questions of how the institution was working to integrate digital technology into their educational tasks. A thematic coding was carried out on all the interview elements relating to artificial intelligence (including ChatGPT), digital technologies and transformative trends in higher education. Following Gibbs (2007), thematic coding involves the process of identification and analysis of themes or patterns within and across qualitative data. In our analysis, we have employed an abductive approach. This means that we have built on a pre-existing theoretical framework, while maintaining an openness to find meaningful categories within the data. In our analysis, we focused on how the various respondents gave meaning to ChatGPT and related technologies and how they rationalised their (potential) consequences for higher education. Subsequently, we analysed each of those elements in line with Scott's (2005) three pillars, resulting in a matrix approach where we look for the three categories in each of these three themes.

This is an explorative qualitative study of the responses of individual actors within three Norwegian HEIs. As such, it does not make claims of external validity or representativity beyond the examined institutions. Nevertheless, as the three institutions do have different organizational profiles, yet show several shared elements in their reflections and responses, we do believe that the interpretations and debates may have relevance to those taking place at other HEIs, both in Norway and elsewhere.

Findings

We now present our findings based on two distinct themes in the data. Utilizing Scott's (2005) three pillars, we first examine the type of change pressure ChatGPT was perceived to represent in the period following its launch — whether it was perceived as an external challenge or threat, and the challenges and implications that artificial intelligence could pose for higher education. Secondly, we outline how the HEIs responded to ChatGPT, the priorities made in the process and why particular choices were made in light of these perceptions.

What kind of external shock was ChatGPT?

Nothing really new, but it feels different

A reoccurring theme in the interviews was whether ChatGPT and related technologies represented something fundamentally new, or whether they simply were a new development in a long line of changes in the higher education system. There were differing opinions on this topic. For example, one leadership representative described ChatGPT as being part of a continuous development — "*to me, it's not revolutionary at all*" (R.1a). In contrast, another respondent in an equivalent position described it as "*radically different, in that it will affect the way we think about what we [need to] teach our students and what kind of knowledge they should have when leaving university*" (R.2a). Those giving voice to the former position pointed to the fact that several of their research communities, particularly within computer science and related subjects,

have been advocating the use of such technologies in higher education for a long time. They also point to other, equally important — and arguably even more groundbreaking — technologies arising all the time, which do not receive the level of attention as ChatGPT.

Although not necessarily recognising ChatGPT as something radically different per se, most of the respondents agreed that it *feels* different from other technologies, pointing to an interesting distinction between the technology itself (as neutral, not-new, machine-like) and the kinds of emotive responses it raises. When asked why they believe this to be the case, one respondent — an academic development unit representative — reflected that it may be because it questions what it means to be human:

"*The challenge here is that (…) it influences how you see yourself. It is so urgent, because here we have a task that only humans can do, which is now being imitated by a machine. That is why I think it has created so much interest and debate. It mostly lies in the fact that this is something that penetrates who we are*" (R.2c).

This was supported by a senior leadership representative from another institution: "*You start to realize that this is more than a gadget, right? It enters me. Why can [ChatGPT] do things that used to require me? I don't think people quite understand that - that it sort of replaces [us]*" (R.3a). Some pointed out that this specifically has to do with the fact that ChatGPT is a large language model. As expressed by one administrative respondent:

"*Our language is hacked. And this is why this feels so fundamentally different from anything else (…) There is so much fear (…) because there are many who see that what they are doing – that is, their work – is becoming redundant. And it is scary*" (R.3e).

Sentiments like these also point towards ChatGPT being seen to challenge wider cultural scripts concerning authorship, language and work, which in turn evoke deeply personal emotions. Moreover, these also point towards ChatGPT being expected to potentially shape some of the fundamental cultural frameworks of our society, pointing towards the cultural-cognitive pillar. As expressed by a senior leadership representative: "*Those who have worked with programming have seen this for a long time, right? So when people like me [social scientists] and administrative staff start to feel that one is becoming redundant, then it has hit a new segment*" (R.3a). In other words, this type of technology is experienced as different because it has a large impact on academic subjects which until this point have largely been insulated from rapid technological change, particularly the humanities and social sciences.

Such perceptions mostly evoke wider cultural-cognitive elements that have for a long time been taken entirely for granted — for example writing as a task, what it means to be an author of a text, or the epistemic process underlying text. Most of the interpretations described here seem to view ChatGPT as a tool that would substantively change how we view many basic elements in higher education.

Fear of the unknown coming at high speed

The feeling that this is something different appeared to be enhanced by the fact that many people in higher education did not really understand what ChatGPT is and what the technology is — and is not — capable of. As expressed by a representative from an academic development unit: *"There is quite a big [knowledge] gap. Everyone probably knows about [ChatGPT] by now. But then there are very different understandings of what it is, how it works and so on"* (R.2c). Several respondents emphasised the level of fear experienced by many HEI staff, often connected with the lack of basic understanding of the underlying

technology. This was supported by an administrative respondent, who highlighted this as a point that distinguishes ChatGPT from other types of technology that has come before: "*There is a great fear and a great uncertainty, because (…) it is shaking things up*" (R.3e).

According to the respondents, the experience of fear and uncertainty is enhanced by the speed by which this development is taking place. Not only did the launch of ChatGPT come out of the blue for many, the development of the technology since November 2022 has been rapid. This further enhanced the feeling that this is something that the average person cannot keep up with. As expressed by one administrative respondent: *"the access to knowledge is suddenly much faster in this case (…) And perhaps we humans are not able to use it well enough, fast enough"* (R.3e). This meant, according to an academic staff representative, that it becomes "*absolutely impossible to land, in a way. That is what is so demanding*". In other words, it is not one specific and determined new technology higher education needs to respond to — it is a continuously moving target.

This uncertainty has important consequences. It shapes how the technology is understood — or not understood — locally. There is a sense of disconnect between the perception that the technology is rapidly changing, while those within higher education institutions have difficulties in keeping up and gaining sufficient knowledge about this development. As will be discussed further below, this disconnect also appeared to influence the actual responses — or lack thereof — of the HEIs.

Changing and challenging higher education as we know it

The idea that advanced language models and AI technology force us to reflect upon the purpose of higher education was something that was present, either explicitly or implicitly, in most of the interviews. Some highlighted their impact on what we consider academic knowledge development, as the reproduction and compilation of knowledge will fall within the language models' range. Others emphasised the effect of these technologies on academic research methodology, as both data gathering, processing and analysis could be something that future models are able to do equally well to humans.

There were varying opinions as to whether this development was something to be embraced or questioned, although most agreed that it is something that cannot be stopped or delayed indefinitely. Whereas some saw this as a positive development — "*[ChatGPT] does the type of work that I find boring. So I'm looking forward to it" (R.3e)* — others emphasised how this may further contribute to what they already see as a "*de-humanisation*" of higher education. As expressed by one academic development unit representative:

"*This, in a way, leads the whole system a bit ad absurdum (…) With ChatGPT, one can potentially imagine that students use ChatGPT to write the exam answers, [but] you also have plagiarism control, which will try to uncover this. And then you basically only have the systems talking to each other (…) and the students and staff, they just participate. They do nothing.*" (R.2c).

Regardless of whether they viewed these developments as being positive or negative for higher education, most respondents agreed that these implications will force HEIs to reflect upon what and how they teach their students — essentially suggesting that there is also a need to change standard operating procedures concerning educational provision. Because ChatGPT and similar LLMs are able to generate text on close to any subject, it will become increasingly important to focus on teaching students generic skills, including critical thinking, creativity and collaborative work forms.

Specifically, the respondents highlighted a need to expand on what critical thinking entails in a digital era, so that students gain a "*knowledge-based, realistic understanding of what AI-generated text is, and what AI-generated graphics currently look like*" (R.3c). There was an expectation that this requires a competence boost among students and staff regarding how this technology works, its possibilities and limitations. As expressed by one administrative respondent, this has to do with the basic digital skills that we as members of a digital society must have going forward:

"[It is important] to have some basic understanding of how computers work. For there are some fundamental limitations here. And knowing them is important, because it is also the key to being able to manage it so that we do not end up in all these sci-fi dystopian images of the future (…) Because it does not come from an independent intelligence. Even if we perceive it that way, that intelligence is, after all, limited" (R.3e).

The latter is important, as not only does this challenge what HEIs teach their students. It also requires a change in how students are taught. As expressed by a senior leadership representative: *"you need to have much, much more awareness of educational design. (…) And that awareness is lacking today"* (R.1a).

Furthermore, some respondents emphasised that the potential implications of these kinds of technologies may go beyond simply teaching and learning, again pointing to shifting cultural norms. As expressed by a senior leadership representative: *"I don't think it only changes teaching and assessment, it also changes the way we have to think about academia. Because if that development continues, then we're going to have to change the types of candidates we produce as well"* (R.2b). When asked to elaborate, the respondent reflected on how this development may lead to HEIs in the future not being required to admit as many students as is currently the case, as the type of jobs and careers many of today's candidates are doing will be performed by machines.

From this discussion, we see that immediately after the launch of ChatGPT, the technology was largely perceived to represent a shock to the normative and, to some extent, the cultural-cognitive pillars. Some of the respondents described the technology as a continuation of what have come before, and therefore just another tool to be regulated and managed. The majority nevertheless perceived ChatGPT as representing something fundamentally different, potentially challenging our current conception of what the purpose of higher education is.

HEIs' response to ChatGPT

In addition to questions regarding what ChatGPT is and its implications for higher education, the respondents were asked to describe how the three institutions had actually responded to the development in the semester following the launch of ChatGPT. Their answers indicate a sense of paralysis regarding how to respond to change pressures along the normative and cultural-cognitive pillars, opting instead for a tentative regulatory response in the short term.

Uncertainty breeds uncertain responses

According to several of the respondents, a high degree of uncertainty, alongside the widespread lack of knowledge, made it very difficult to respond to ChatGPT in the period immediately following its launch, despite pressure from staff and students to develop clear rules and guidelines. At all three HEIs included as part of this study, the concrete response

to ChatGPT was still pending at the time of the interviews, meaning that few decisive steps had so far been taken. As described by one administrative respondent: "*It is obvious that the response is still very immature, how we should actually handle it (…) This is only the beginning*" (R.3d). This stands in contrast to the sense of urgency and transformative expectations voiced by many of the respondents above.

The area where the need for action was felt most urgently was in higher education assessment, representing an example where both the normative and regulative dimensions are present. Echoing much of the debate seen in the media, LLMs were perceived to pose a threat to traditional forms of assessment because of their ability to generate text near indistinguishable from that written by humans. This was not necessarily the case for the more traditional, on-campus exams, where access to the internet might be limited or restricted altogether. Instead, ChatGPT was particularly seen to pose a threat for take-home or essay-based assessments, where students are at liberty to make use of all available aids and sources, including resources found online.

A topic of discussion raised at all three HEIs was whether to return to campus-based exams in order to prevent students making use of ChatGPT when writing their final assessment papers. At least among the senior leadership representatives, there was a clear sense that this would equate to "*going backwards*" (R.3a) and that they had to "*meet this technology in a more offensive way*" (R.2a). However, a few of the respondents — particularly those who had the role of administrator for specific courses in addition to their more strategic roles — described how they had decided to change the format of the exam back to campus. According to these respondents, this was, at least at that time, one of the most efficient ways to prevent students using ChatGPT to write the answers for them.

On a more general level, respondents from all three HEIs described how they had begun the process of updating their guidelines on the use of ChatGPT in exams and other forms of formal assessment. As described by a senior leadership representative, "*ChatGPT challenges us in a positive way to some extent, that we will have to re-think our assessment methods. And I think higher education benefits greatly from that*" (R.1g). However, as emphasised by the same respondent, academic staff must have the necessary *"time, resources and pedagogical skills"* to do so, which they do not necessarily possess at present. In addition, it requires that academic staff explain to students what the purpose of assessment in fact is. As expressed by a representative for an academic development unit:

"*When I write, there is a lot of learning in the writing process itself. It is not like you can outsource it. Yes, ChatGPT can write the text for me, but I develop my thinking through writing. And I think that is something we need to talk to the students about a lot more. Why should you write this assignment? It is not just because you have to get a grade*" (R.2c).

Aside from updating their guidelines concerning GDPR and assessment respectively, all respondents described how their primary focus had been on facilitating discussions, both through strategic and open forums and seminars. These discussions had focused on what ChatGPT is, how it may be used practically and pedagogically, and on the implications of ChatGPT going forward. As described by another administrative respondent:

"*We are probably very similar to the other [Norwegian HEIs] here. We do not have the answers. But we have had a decent number of good discussions around it and (…) organized a couple of seminars on artificial intelligence (...) it is probably the most concrete thing we have so far*" (R.3d).

All three HEIs have also created contact points where staff — and, in some cases, students — can receive help and advice regarding concrete issues and questions. This was partly in response to what several of the respondents described as an increased demand from academic staff for competence development and information regarding ChatGPT and

related technologies. This was, according to the respondents, connected to the fact that "*more people [are] realizing that we are in a bit of trouble, because we do not fully understand what is going on*" (R.3a). This reflected the large sense of confusion regarding what ChatGPT actually is.

There will be a revolution, just not yet

Some of the respondents described how they have started the process of updating courses directed at staff and students regarding information security and information evaluation. These courses were by many seen as important for the long-term response to this kind of technology. As described by one senior leadership representative: "*we have to think about both the short term and the long term*" (R.2a). In the short term, they argued that focus must inevitably be on how to guide lecturers and others to create better exam papers, avoid the use of LLMs in assessments and so on — a combined regulatory and normative response. In the long term, however, the respondent described how "*it is clear that we must use the technology (…) and embrace it, rather than thinking that it is a threat to us*" (R.2a) — emphasising the cultural-cognitive pillar.

Similar to this respondent, several of the others interviewed described how the current developments were "*something that must be embraced*" (R.3f), something that "*we should not put an end to*" (R.3e) and that they had to "*approach the technology more offensively*" (R.2a) than is currently the case. As described by a senior leadership representative: "*I think we should hurry slowly and not be rushed*" (R.3a). However, they were all rather vague regarding what this would actually entail in practice and how this was to be done. As will be discussed in more detail below, this appeared to be connected to what they saw as the fundamental nature of the implications associated with ChatGPT and related technologies for higher education.

This suggests that in terms of concrete activities, short term responses were primarily envisaged along the regulative pillar, while the anticipation remained that long term changes would be more in line with the transformative expectations. At the time of the interviews, however, few of the key respondents had a good idea what this would mean in practice or what conditions that would have to be in place for this to happen.

Discussion

The data above suggests considerable uncertainty as to how to tackle ChatGPT as a tool in higher education. Looking in more detail as to what kind of pressures ChatGPT represents, we find a range of interpretations within the three pillars outlined by Scott (2005).

As regards the regulative pillar, it is clear from the findings that the introduction of ChatGPT and other LLMs — particularly in the short term — was viewed as a change that needed to be regulated and to some extent controlled, particularly when it came to their use in exams and other forms of formal assessment. All three institutions reported on how there was a demand among staff for more precise rules regarding the use of ChatGPT and related technologies. Due to the perceived lack of such clarity, some members of staff had expressed a wish — or even opted — to return to in-person exams at campus, to guarantee that artificial intelligence was not used to complete the examination. This suggests that when faced with uncertainty, the immediate response would be to return to a familiar

option that 'works' rather than engage in immediate innovation. After all, in-person exams still are among the standard operating procedures for HEI assessment.

Secondly, within the normative pillar, ChatGPT also posed a challenge to conceptions of appropriate ways to go about activities in higher education. In particular, well-established forms of assessment — where students are asked to reproduce and, depending on their academic level, produce new knowledge — were perceived to be challenged by a form of technology which precisely has the reproduction and recombination of known knowledge as its primary strength. As shown above, the respondents described how ChatGPT had led to the questioning of the appropriateness of certain forms of assessment, which again forced them to "*change the way [they] think*" about exams. Some described how this has brought to the fore an issue which was already present in higher education, namely the fundamental purpose of assessments and the learning that should be involved in it. At the same time, there were few options ready, which in turn meant that the path towards entirely new assessment methods in a broader scale was still quite long.

Finally, ChatGPT appeared to challenge what higher education is and the purpose of the students and staff found within it, that is, elements within the cultural-cognitive pillar in Scott's (2005) conceptualisation. Reflecting on how ChatGPT and related technologies may make many jobs currently in existence superfluous, including jobs associated with research and education, the respondents described the existential fear and uncertainty that many of their colleagues were experiencing. If artificial technology replaces many of the people who in HEIs are tasked with educating, what will be the point of teaching?

Despite the realisation that ChatGPT represented a shock to both the regulative, normative and cultural-cognitive pillars, and the rapid nature in which these developments were happening, it is interesting to note the pending and tentative nature of the HEIs' response during the first six months after ChatGPT's launch. There was a clear distinction between short- and long-term interpretations, and between the transformative expectations and the practical regulative responses that had taken place. Although most agreed that this technology was something to be "*embraced*" and approached "*offensively*" (in the long run), none of those interviewed showed a clear sense of what this entailed in practice. Focus primarily appeared to be on the need to regulate exam situations and the unlawful and unethical use of the technology.

Instead, the interview material illustrates a sense of stasis. It appeared to be an expectation that ChatGPT and related technologies would challenge both wider cultural frames, as well as norms and values concerning educational practices. Yet, no obvious solutions seemed to exist, resulting in a form of organisational paralysis where the action taken was incremental, mostly addressing side effects. This further accentuates the temporal tension in this debate. Developments around AI and ChatGPT took place at an enormous speed, while responses seemed to be slow.

The fact that ChatGPT is viewed to present a challenge to all three pillars could suggest that it is seen to have the potential to challenge the institutional fabric of educational provision. How precisely this would take place, however, remains to be seen. A step suggested as a potential way forward was to improve both students and staffs' knowledge about what this technology is, its possibilities and limitations. In other words, it points to an expectation that the influx of AI technology requires both a technological and pedagogical competence change among staff and students, not least as it is also set to change the disciplines and professions themselves — and the labour market receiving the graduates.

While seemingly a 'simple' solution and one which is often proposed as a transversal answer to a number of issues, this expectation of competence upgrade presents a considerable challenge for HEIs. The scope of training needed is considerable, if academic staff

now need to be sufficiently competent to educate future technology users with relevant digital skills, and to be aware of limitations and opportunities inherent in the technology. This cannot be isolated into a single LLM course but would need to penetrate across different subjects and courses to make it relevant for the subject domain. The required boost in digital competencies among staff is thus no simple boon for the HEIs, nor is the need to further boost pedagogical skills. The required competence enhancement has to do with how the subject matter is becoming digitalised also out in society as a whole.

However, it is telling that in the interviews, these changes were envisaged to take place within existing or well-known institutional structures. The respondents talked of "*updating*" their current courses, for example the basic university-pedagogical course for staff or the critical thinking course for students. This may indicate a need to bring these technological developments within something known and familiar. However, the institutional implementation of training for all staff and students in relatively advanced AI technology is likely to require greater institutional change than merely updating existing structures.

Conclusion

The starting point for this analysis was how HEIs respond to a rapid and unfamiliar digital development, exemplified by the abrupt launch of ChatGPT in November 2022. Our analysis points towards several patterns. First, there are mixed impressions of what the technology entails, and what its potential consequences would be. There is both an epistemic imbalance in that many do not understand the technology well enough to know what it can or cannot do, and there is also a general uncertainty over what this technology could and should mean for higher education. Questions concerning regulative issues — for example rules for using additional resources at exams — have been the first element to obtain attention, as this is also the most obvious arena where the introduction of ChatGPT has challenged existing rule systems. LLMs enable new forms of rule-breaking, and rules must be changed in order to prevent that from happening.

Second, while the regulative elements concerning educational provision (particular assessment) have received much attention at this point, ChatGPT has also evoked expectations that suggest that key norms and values are at stake. In other words, it brings to the fore questions regarding how education as a task should be carried out, what are the roles and responsibilities of those participating in a learning process, and what are appropriate elements for a course design. While discarded by some respondents, it has raised debates about the "death" of the student essay and take-home exams. Moreover, there are also expectations of wider cultural-cognitive shifts concerning fundamental concepts that may need to be entirely reinterpreted — including authorship, writing and originality. The fact that ChatGPT is viewed to potentially challenge both regulative, normative and cultural-cognitive aspects of higher education suggests that there is a potential for far-reaching changes. At the same time, it is also likely that these changes would impact different disciplines in different ways.

For the HEIs, these expectations resulted in a strong temporal tension. Due to uncertainty concerning the nature of the technology and rapid development making it a moving target, there was considerable organizational paralysis regarding how to respond. While there seemed to be agreement among respondents on the necessity to be "*proactive*" and "*embrace*" this new technology, few solutions and ideas on what to do and how to do it were brought to the fore. A general approach seems to be to "wait and see". This may be a

concern but is it not unique for higher education. Society at large is also struggling to keep up with the development of AI technology, that is currently taking place at a neck-breaking speed. As such, it is perhaps not surprising that also HEIs are in a state of paralysis. Nevertheless, regulation and oversight of artificial intelligence have been lagging behind in a drastic manner, and experts in various sectors have been calling for more regulation of AI. "Wait and see" may thus not be a viable strategy in the long term.

This study is limited to the views and responses of three Norwegian HEIs to ChatGPT and, as such, may not be taken as a blueprint for how the higher education sector more generally has dealt with and addressed this development. More research — both quantitative and qualitative in nature — is urgently needed to address the substantial knowledge gap created by the introduction of ChatGPT and related technologies in higher education. This article has shown that the issues and challenges raised by ChatGPT and LLMs more generally, may not be something that HEIs and public authorities may simply "regulate" their way out of. They concern fundamental questions within various disciplines and professions, and how HEI should educate for a future labour market. It also raises questions about appropriate action on an organisational level, what should remain within the specific knowledge domains, and whether this balance, too, might be influenced by technological development. It might be worth viewing this situation as an opportunity to engage in a deeper discussion regarding what the purpose of higher education is in the twenty-first century, what skills and competences we wish and expect students to have when leaving university, and what role digital technology — and artificial intelligence technology in particular — ought to play in this process.

Acknowledgements Alongside the authors, Aslaug Louise Slette and Lone Wanderås Fossum were central in the data collection process underpinning this study. The article also benefited from feedback from Elisabeth Hovdhaugen and the anonymous reviewers. All errors remain the authors' own.

Funding This study is part of an ongoing research project on the use of digital technologies in higher education. The project is led by The Nordic Institute for Studies of Innovation, Research and Education (NIFU), in collaboration with University of Oslo and Inland Norway University of Applied Sciences. The research project was instigated and funded by the Norwegian Directorate for Higher Education and Skills (HK-dir), the Norwegian Agency for Shared Services in Education and Research (Sikt), and the Norwegian Agency for Quality Assurance in Education (NOKUT).

Declarations

Conflict of interest The authors declare no competing interests.

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