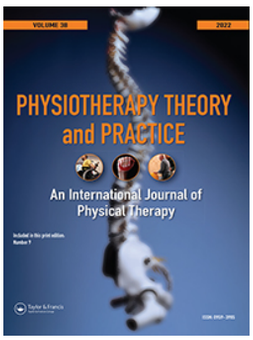

Taylor & Francis
Taylor & Francis Group

Physiotherapy Theory and Practice
An International Journal of Physical Therapy

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iptp20

"Learning is about being active, but the digital is not really active": physiotherapy teachers' attitudes toward and experiences with digital education

Nina Bjerketveit Ødegaard, Yngve Røe & Tone Dahl-Michelsen

To cite this article: Nina Bjerketveit Ødegaard, Yngve Røe & Tone Dahl-Michelsen (2022): "Learning is about being active, but the digital is not really active": physiotherapy teachers' attitudes toward and experiences with digital education, Physiotherapy Theory and Practice, DOI: 10.1080/09593985.2022.2119907

To link to this article: https://doi.org/10.1080/09593985.2022.2119907

Published online: 04 Sep 2022.

PHYSIOTHERAPY THEORY AND PRACTICE
https://doi.org/10.1080/09593985.2022.2119907

Taylor & Francis
Taylor & Francis Group

"Learning is about being active, but the digital is not really active": physiotherapy teachers' attitudes toward and experiences with digital education

Nina Bjerketveit Ødegaard, MEd, MS[a], Yngve Røe, PhD, PT[a], and Tone Dahl-Michelsen, PhD, PT[a,b]

[a]Department of Rehabilitation Science and Health Technology, Oslo Metropolitan University, Oslo, Norway; [b]Department of Health, VID Specialized University, Oslo, Norway

ABSTRACT

Background: Digital education is expected to transform higher education teaching and learning. Despite high expectations, higher education teachers have been slow to implement active digital learning.

Objective: The aim of this study was to investigate physiotherapy teachers' attitudes toward and experiences with digital education and what the teachers' considered prerequisites to a digital transformation of teaching and learning in physiotherapy.

Methods: Qualitative in-depth interviews were conducted with 12 teachers in physiotherapy education. The interviews were analyzed using inductive thematic analysis.

Findings: The findings illuminate teachers' attitudes toward and experiences with digital education and their views on prerequisites to a digital transformation of teaching and learning in physiotherapy education, presented as four themes: 1) skepticism toward digital education; 2) digital technology as a tool to support the established teaching practice; 3) longing for teacher collaboration; and 4) calling for time to plan and learn, and significant academic leadership.

Conclusion: This study shows how physiotherapy teachers are skeptical about digital education, primarily viewing it as a threat to established teaching practices. Taken together, the findings demonstrate a potential for digital transformation in physiotherapy education, which can be released by informing the current teaching practices with evidence from research showing how use of digital technology can improve teaching and learning in physiotherapy education.

ARTICLE HISTORY
Received 5 December 2021
Revised 27 August 2022
Accepted 27 August 2022

KEYWORDS
Digital education; digital transformation; teacher collaboration; academic leadership; physiotherapy teachers

Introduction

Digital education is an umbrella term for various teaching approaches that involve a multitude of concepts, methods, and technologies (Car et al., 2019). Digital education designs are commonly termed blended learning; they combine digital online learning and in-person learning activities or fully apply distance learning (asynchronous or a combination of asynchronous and synchronous learning) on various application platforms and software. The recent Digital Education Action Plan (2021-2027) of the European Commission states that digital education should facilitate more personalized, flexible, and student-centered teaching and learning (European Commission, 2021). Despite these intentions until now, digital technologies have mostly been used to support traditional teaching approaches instead of pedagogically planned implementation of the technology (Bates, 2015; Lillejord, Børte, Nesje, and Ruud, 2018). There is evidence to suggest that digital learning designs in the form of blended learning and distance learning are equally or more effective compared with traditional teaching in physiotherapy education (Ødegaard, Myrhaug, Dahl-Michelsen, and Røe, 2021). Nevertheless, physiotherapy educators have been hesitant to implement digital education (Rowe, 2018; Unge, Lundh, Gummesson, and Amnér, 2018). In line with the findings from Lillejord, Børte, Nesje, and Ruud (2018) Rowe (2018) pointed out how physiotherapy is characterized by knowledge transmission rather than knowledge transformation. Whereas the first concept entails an understanding of teaching as a delivery of content where learning is teacher focused, the latter involves an active student-centered approach to learning. Here knowledge is developed by transformation and the role of the teacher is to organize so that students can active re-construct their knowledge as to create a new understanding of their knowledge (Rowe, 2018). Our position as educational researchers are in line with the understandings forwarded by Lillejord, Børte, Nesje, and Ruud (2018) and Rowe (2018).

The slow changes in teaching and learning approaches are far from unique to physiotherapy education. For decades, the slow implementation of student

CONTACT Nina Bjerketveit Ødegaard ninabjer@oslomet.no Department of Rehabilitation Science and Health Technology, Oslo Metropolitan University, Post Box 4. St. Olavsplass. Oslo 0130, Norway

active learning approaches at universities has been highlighted as a serious problem for higher education (Bates, 2015; Bonwell and Eison, 1991). A recent review on barriers to student active learning in higher education concluded that better alignment between research and teaching practices, supporting infrastructure, and staff professional development were prerequisites to transformation and success (Børte, Nesje, and Lillejord, 2020).

Until now there has been little research devoted to teachers' attitudes toward and experiences with digital education and what teachers consider to be prerequisites to a digital transformation of teaching and learning in physiotherapy education. Accordingly, the aim of this study was to investigate this topic. We addressed the following research questions: What are physiotherapy teachers' attitudes toward and experiences with digital education, and what do they consider prerequisites to a digital transformation of teaching and learning in physiotherapy education?

Methods

This study included human participants, and ethical approval was obtained from the Norwegian Center for Research Data (ref. # 862743). Ethical consent, data collection and storage, and ethical care of the research participants were integral to the research design, as well as to planning and carrying out the whole study. To investigate these research questions this study was designed as a qualitative study involving individual in-depth interviews with 12 teachers in Norwegian physiotherapy education. The interviews were conducted in line with recommendations from Kvale and Brinkmann (2009, 2015). All interviews took place between June and November 2019.

Recruitment

The participating teachers were recruited from three different locations offering physiotherapy education in Norway. In the recruiting process, we emphasized that participants had varied teaching experiences and ensured diversity in participants age and gender. In the recruitment process, the first author contacted the educational leaders (i.e. department heads) of Norwegian physiotherapy education programs. The leaders received information about the study, which they passed on to their subordinates. Following this initiative four teachers contacted the first author all of whom were included in the study. Additionally, the first author contacted four teachers suggested by one of the department heads; however, no teachers were recruited through this strategy. Furthermore, seven participants were contacted directly by the first author. This contact was based on an available employee overview at one of the institutions, and we considered this a follow-up, as these teachers had already received information from the educational leaders. One of these teachers did not want to participate in the study, whereas the six others accepted the invitation and were included in the study. In addition, we used the snowballing strategy, which implied that candidates for the study were proposed by already included participants. We recruited two participants using the snowballing strategy.

Interviews

Altogether 12 interviews were conducted. Of these, seven were in person and five were online using Skype (https://www.microsoft.com). All interviews were conducted by the first author and lasted for an average of 60 minutes. The face-to-face interviews were recorded with the app Diktafon (https://www.uio.no/tjenester/it/adm-app/nettskjema/hjelp/diktafon.html) and software program Audacity (https://www.audacityteam.org/) and the online interviews were recorded using the audio-recording tool in Skype and the Diktafon app. Before the interviews started, participants gave their informed consent to participate in the study. The interviews were based on a semi-structured interview guide, ensuring an open and free conversation with the participants. The main questions were related to participants' educational background, role as a teacher, views on and experiences with digital education, thoughts about digital education in the future, and questions related to concerns, barriers, and prerequisites to implementing digital education in physiotherapy education.

Use of a semi-structured interview guide also offered an openness for the participants to address themes they were particularly engaged with; thereby there was a certain variation among the interviewees (Kvale and Brinkmann, 2009). The participants' teaching experience ranged from 2 to 30 years (Table 1). For anonymization each participant was given a number (1–12).

Data analysis

The interviews were analyzed using a stepwise, inductive thematic analysis, as outlined by Braun and Clarke (2006, 2021). The first step concerns familiarizing yourself with the data, including transcription, rereading of data, and noting initial ideas. Next, initial codes are generated from the whole data set. The next phase is searching for themes by sorting and collating all the coded data and merging these codes into new themes. The identified themes are then "mapped" and named.

Table 1. The participants' characteristics.

Participant	Gender	Job title and level of education	Teaching experience	Teaching level experience	Teaching subjects	Experiences with digital education
1	Male	PhD, Associate professor Course in Teaching and Learning in Higher Ed.	10 years	Undergraduate level inPhysiotherapy Further education Entry level	Theoretical subject	Undergraduate learning Digital storytelling Canvas (used as an information and communication platform)
2	Female	MA, Assistant professor Course in Teaching and Learning in Higher Ed.	10 years	Undergraduate level inPhysiotherapy	Theoretical and practical subjects	Undergraduate learning (flipped classroom) Kahoot, Padlet, Ted Talks, YouTube Canvas (used as information and communication)
3	Female	MA, Assistant professor Course in Teaching and Learning in Higher Ed.	30 years	Undergraduate level inPhysiotherapy, Occupational therapy and Teacher education	Theoretical and practical subjects	Undergraduate learning Videos (theoretical and practical skills) Reflection on the videos Students involved in finding digital learning resources Canvas (information and communication)
4	Female	MA, Assistant professor Further education in supervision Course in Teaching and Learning in Higher Ed.	26 years	Undergraduate level inPhysiotherapy Further education	Theoretical and practical subjects	Undergraduate learning Interactive e-learning course (basic/micro-course): videos, tests, illustrations Apps, web pages Canvas
5	Female	PhD, Associate professor Course in Teaching and Learning in Higher Ed.	30 years	Undergraduate level inPhysiotherapy Entry level	Theoretical and practical subjects	Undergraduate learning e-learning course Discussion forum Digital quizzes (assessment) Canvas, EdX
6	Female	PhD, Associate professor Course in Teaching and Learning in Higher Ed.	5 years	Undergraduate level inPhysiotherapy Further education	Theoretical and practical subjects	Blended learning Videos, Kahoot, Podcasts E-learning resources Canvas
7	Female	PhD, Associate professor Course in Teaching and Learning in Higher Ed.	8 years	Undergraduate level inPhysiotherapy	Theoretical subjects	PowerPoint presentations Pictures Digital figures
8	Female	PhD, ProfessorCourse in Teaching and Learning in Higher Ed.	23 years	Undergraduate level inPhysiotherapy Further education Entry level PhD level	Theoretical and practical subjects	Undergraduate learning and flipped classroom) Canvas (e-learning course) Apps VideosQuizzes Websites
9	Female	MA, Assistant professor Ongoing course in Teaching and Learning in Higher Ed.PhD student	2 years	Undergraduate level inPhysiotherapy Entry level	Theoretical and practical subjects	Undergraduate learning Podcasts Quizzes Videos Canvas
10	Female	PhD, Associate professor Course in Teaching and Learning in Higher Ed.	23 years	Undergraduate level inPhysiotherapy Entry level	Theoretical and practical subjects	Undergraduate learning as flipped classroom Video lectures Canvas
11	Female	MA, Assistant professor Ongoing course in Teaching and Learning in Higher Ed. PhD student	10 years	Undergraduate level inPhysiotherapy	Theoretical and practical subjects	Undergraduate learning YouTube Podcasts Videos (self-produced) Canvas (facilitating learning pathways on the platform)
12	Female	PhD, Associate professor Postdoc Course in Teaching and Learning in Higher Ed.	2 years	Undergraduate level inPhysiotherapy	Theoretical and practical subjects	Undergraduate design Kahoot, Virtual reality (VR), Podcasts Videos from different platforms: EdX, Khan Academy Crash courses Canvas (learning pathways)

Lastly, a report/paper is constructed, and the writing includes a final analysis.

The first author conducted and subsequently transcribed the interviews and carried out the initial analysis. The transcribed interviews were analyzed in collaboration between the first and last authors. After familiarizing themselves with the transcribed interviews, they worked collaboratively in the analysis of the data. This process included several meetings over a period of seven months. The third author took part in two out of five longer analysis meetings. In these meetings, we paid attention to discussions regarding some of the questions that arose during the analysis. Consistent with the recommendations from Braun and Clarke (2006) we believe that this analysis ensured a process in which various interpretations of codes and themes were comprehensively discussed. Additionally, the interpretation of the findings was discussed in two meetings with research groups in which the authors participate. This approach contributed to the validation of the empirical data interpretation.

Findings

The physiotherapy teachers' attitudes toward and experiences with digital education and their views on prerequisites to digital transformation of teaching and learning in physiotherapy education include four themes: 1) skepticism toward digital education; 2) digital technology as a tool to support established teaching practice; 3) longing for teacher collaboration; and 4) calling for time to plan and learn, and significant academic leadership.

Skepticism toward digital education

The teachers' attitudes toward digital education were colored by skepticism. More specifically, their skepticism was related to how the call for digital education from the political and institutional levels was at odds with the teachers' professional ideals. In the interviews, it came to the fore that the teachers emphasized bodily learning and physiotherapy as a craft, which they experienced to be threatened by the call for digital education. As one of the participants said:

> Today almost everything is digital . . . But physiotherapy is a craft, which must be learned together. The digital must not come at the expense of immersion . . . Bodily relationships cannot be achieved by the digital". (Participant 9)

Furthermore, the view that digital education was at odds with professionals' ideals in physiotherapy education typically related to an attitude toward digital education as passive learning, whereas learning the craft of physiotherapy should be active. As one of the participants expressed:

"Learning is about being active, but the digital, it's not really active." (Participant 5)

Additionally, the teachers considered that cost-saving was a "hidden" motive for introducing digital education. They feared that timesaving achieved by reuse of digital learning materials for students' preparation before in-class teaching would not give teachers more time with students during in-class teaching. From the teachers' perspective, the latter was seen as a possible motivation for digital education. However, they were worried that the digital education actually came at the cost of real physiotherapy which they described in terms of being active and "hands on." As one of the participants expressed:

> I am concerned with active learning, bodily experiences, exploring the body and knowing in different ways (. . .) trying to get students active. I am interested in letting them be able to understand, assess and analyze and know the bodily aspects they explore and experience the fields I teach. (Participant 4)

Moreover, teachers' skepticism toward digital education also related to how digital education was considered to be somewhat vague. Indeed, the teachers pointed to digitalization as a buzzword with unclear meanings in their teaching practices. Going into more depth regarding their skepticism the teachers were worried that technology came at the cost of the "real" human skills considered to be an essential part of physiotherapy practice.

Although the teachers were skeptical about digital education, they felt quite strongly on expectations that they should be updated in relation to digital education and to digitalization in society more generally. The expectations of digital education as part of physiotherapy education were addressed as a request from their institutions, in terms of digital strategies.

Accordingly, although the teachers were skeptical they also somewhat embraced digital education. The latter was related to the teachers' attitudes toward students' learning. As one of the participants stated:

> Digitalization is also about how they [students] think about their own learning. Is it like it is fun and appeal very much . . . I see that students can get a lot out of class when the tasks and work methods are well planned . . . . it requires more of me [as a teacher]". (Participant 6)

As such, adapting technology was also considered exciting and engaging and seen as a way to keep up with students as well as something that could be used in addition to in-class teaching. Teachers' attitudes toward and experiences with digital education also included their use of digital technology.

Digital technology as a tool to support established teaching practice

Use of digital technology was part of the teachers' experiences with digital education and revealed to be a tool to support the established teaching practice. In the interviews, the established teaching practice was presented as a practice in which the teacher was the one who planned and decided on the learning activities, and mostly, this work was conducted individually by each teacher. However, when the learning activities involved group work, it was more common for the teachers to plan such activities together with other colleagues.

In the planning of courses, lectures, and group work, whether individually or collectively the established practice did not include that the teacher strategically used a didactic planning model. The established practice as described by the teachers involved that when planning their teaching, the teachers' starting point was the learning outcomes for the respective course in the curriculum, which they used as a guide for what content to focus on.

In the interviews, the teachers described their experiences with digital technologies in line with the established practice. They used digital technologies mostly as preparation for in-class teaching and learning, and such planning of use of technologies for their lecturing was mostly conducted by each teacher individually. As one of the participants said:

> I do the usual preparation; I consider what are the learning outcomes for the students, what should they read and do, what central questions arise within this teaching". (Participant 3)

This practice of using digital technology to support established teaching practices in which the teachers worked mostly individually was most prominent in planning learning activities that students should do individually. When the in-person teaching involved group work it was sometimes planned by a group of colleagues. One of the participants said:

> We have made e-learning courses that students can use to build up their basic knowledge. Earlier we offered the content of [these] courses in lectures. Now they [students] can be responsible for this themselves through these interactive e-learning courses. Teachers in the team are talking about pedagogy … and also, we talk about the importance of supporting each other. We [the team] are concerned with each other's teaching related to what content comes pre- and after, and we discuss what and how to stimulate the students in teaching and their learning. (Participant 4)

This practice involves students being more responsible for their own learning, which the teachers considered to be both a continuation of how students in physiotherapy had learned before the introduction of digital education and part of a new practice related to digital education in higher education. Teachers regarded the emphasis on supporting each other as teachers and discussing how to stimulate students' learning as more focused in relation to use of digital technology compared with preparing activities that did not involve use of digital technology.

Furthermore, digital education was primarily facilitated as an individual approach for students' learning. That is students' preparation before class was framed as individual learning as opposed to collaborative learning. Students' preparations included a variety of digital technologies and digital formats (e.g. watching YouTube videos or video lectures, listening to podcasts, using interactive apps, completing interactive e-learning courses, and reading digital files). This use of digital technology only supported established teaching practices in terms of providing students with activities for individual work which before the introduction of digital education involved reading literature such as books and research articles. That is, these preparations involved new ways of learning for the students. However, the digital learning materials were often additional resources to the syllabus and were to a limited extent provided as "learning paths" in the form of contextualization with goals, content, and tasks in the learning management software platform as expressed by one of the participants:

> I use Canvas actively, post learning outcomes for the teaching, tell students how they can learn the subject(s), [provide an] introduction to topics and why [they are] relevant. I also post some resources they can prepare in advance (e.g. articles, book chapters, podcast[s], and YouTube movies). Then I am freer and have less theory-based teaching. I've also planned more group work. (Participant 11)

In the interviews, it came to the fore that the option of freeing up time was the main driver for teachers' motivation to use digital technologies in students' learning. The teachers were concerned that they did not convey what they saw as important and felt obliged to because of a partly overcrowded curriculum, limited time for planning, large group sizes, and difficulties in scheduling

enough lectures to cover the course content. Thus, they were looking for options to free up more time, and digital education provided an opportunity to do so. That is by sharing digital learning resources with the students as preparation for in-class learning, they had an opportunity to release time that could be spent differently. This time was used for practical training, which, according to the teachers, involved more student active learning. Here the teachers typically supervised the students and offered feedback in the skills training or gave students various assignments in which the students worked together in groups on different topics and skills. Such training also involved students giving feedback to their peers. These approaches were often combined.

Notably digital technologies first and foremost were used as preparations for the in-class teaching, seemingly without changing the pedagogical approaches to in-class learning. That is the technology was used to support the established practice. When used in in-class teaching, the technologies were most often used to create variation in the learning activities and more as "fun" activities, often including a competitive element. As one participant expressed:

> When you pull up a Kahoot or do things like that, the student finds it exciting and fun, but if all the teachers use Kahoot because it's easiest, it loses a little bit of interesting news. (Participant 2)

Overall, the teachers' approach to digital technology was primarily revealed to be a supportive tool to continue the established teaching practices that is without changing pedagogical approaches and learning activities in the in-class teaching.

Longing for teacher collaboration

As already presented, the interviews revealed an established practice of teachers working individually, but there are also several examples of collaboration among colleagues. Although the teachers desired more collaboration with colleagues, generally there was also an explicit longing to work collaboratively on how to facilitate and integrate digital technologies in their teaching practices. That is the teachers underscored that they wanted to participate in different "competence courses" together with their colleagues to develop their digital skills and to learn and explore together the pedagogical opportunities in digital education. This also calls for collaborative learning related to a need and wish to strengthen a culture of sharing (i.e. sharing of digital learning resources, skills, and pedagogical use of digital technology). The teachers had positive experiences with such learning, which involved sharing of digital learning resources within and across educational institutions and learning with and from colleagues' teaching practices with digital technology. They felt inspired and empowered when participating in such practices. As one of the participants expressed:

> I think that as a teacher alone, I can't think that I'm going to fix digital technology alone. There must be academic staff that takes an interest together to develop and exchange their experiences, develop learning methods and tools and then share it. … I have a need to develop this expertise in a team. (Participant 3)

To meet such expectations of being updated on digital technologies, the teachers called for digital support provided by their institutions.

Calling for time to plan and learn, and significant academic leadership

They highlighted such support as a prerequisite for them to be able to redesign their courses and teaching approaches. Additionally, the physiotherapy teachers requested more time given by their leaders in their "work plan" (planning sheet) or through allocated projects or research funding. The need for more time was a topic addressed several times in the interviews. Specifically the teachers felt that more time was needed to explore digital education and to design successful teaching practices that implement digital technology. For some of the teachers the request for time was more general, whereas for others it was directly associated with a lack in their own skills and competences, as expressed by one teacher:

> I think there's a lot of opportunities that I don't use. But it is time pressure; changing practice requires extra preparation time … I'd like to try quizzes and Kahoot. I wish to have time and to get help in using it … I want to use it and think it will provide more variations in the teaching. (Participant 7)

Teachers called for more supportive leadership to transform to digital education, which included a wish to strengthen a culture on pedagogy to be able to transform education. As one of the participants expressed:

> Without understanding what the academic leaders emphasize and think about teaching, it is difficult … . It is very important for the culture of the organization. The leaders need to facilitate a culture where pedagogy is important, and pedagogy and research are very interrelated. (Participant 10)

The teachers said that they lacked clear expectations, commitment, and acknowledgment about digital education from their academic leaders. As one of the participants said:

> They [leaders] are important if the strategy of digitalization is to be realized. They want us to be innovative and enthusiastic in the exploring and facilitation of digital technology. But they need to make time for us to learn [properly] and also the practical implementation; give us the opportunity to learn one thing at a time, not learn everything. Or freely to learn what each individual teacher wants to learn. (Participant 7)

To succeed with the digital transformation and to ensure that the teaching methods and practices were evidence based, the teachers called for leaders to have insight, that is, knowing what it takes to change teaching approaches and to develop such practices. One of the participants said:

> I am very concerned about it [the absence of focus on evidence-based teaching methods]. When teachers make any choices, it should be based on this [evidence from educational research], but this is not the situation today. I don't think it's a lack of interest, but people are pressured on time, and they don't read research on pedagogy neither. It is not in focus, and it hasn't been an issue that they're not concerned about it . . . . And leaders who do not see what [this shift] requires from people, then it is hard to get it right. (Participant 8)

Here, lack of time and a call for leaders to be involved and engage in professional development of teaching and learning in a digital age are related to absence of use of evidence-based teaching methods.

Discussion

The current study is one of the first of its kind, investigating physiotherapy teachers' attitudes toward and experiences with digital education and what the teachers consider prerequisites to a digital transformation of teaching and learning in physiotherapy education. The findings revealed four themes: 1) skepticism toward digital education; 2) digital technology as a tool to support established teaching practice; 3) longing for teacher collaboration; and 4) calling for time to plan and learn, and significant academic leadership. Based on our findings, we will discuss the potential for a digital transformation of teaching and learning in physiotherapy education.

A main finding in the current study is the physiotherapy teachers' view of digital education as contrary to their ideals of practical and bodily learning in the curriculum. Historically, bodily competences have been at the heart of physiotherapy, and bodily learning has been, and still is, considered essential in physiotherapy education (Dahl-Michelsen, 2015; Langaas and Middelthon, 2020). Bodily competences and bodily learning have been described as physiotherapy's signature pedagogy (Jensen et al., 2019). The findings in our study show how the teachers considered such understandings of bodily knowing and bodily competences/skills to be contrary to learning with digital technology. These disciplinary characteristics of learning in physiotherapy education could explain some of the teachers' hesitance to implement digital education. Such hesitance is, however, not unique to physiotherapy education, as barriers for digital education related to teachers' conceptions of teaching have been found across disciplines (Børte, Nesje, and Lillejord, 2020). Furthermore, there is a need for learning and teaching in higher education to be informed not only by disciplinary traditions and evidence from the actual discipline but also by evidence from research in the field of learning science (Jensen et al., 2019). In other words, teachers need to have a language and possibilities to discuss the more pedagogical aspects of teaching and learning, not only the content.

Although the teachers in our study were somewhat hesitant to implement digital technologies, they still used various digital technologies in their teaching practices, and the teachers' experience with sharing digital learning materials with the students as pre-class preparation materials points to a positive attitude related to such use. Their use of various digital technologies, however, first and foremost supports their established teaching practices. In other words, the digital technology is not used to transform teaching and learning in the physiotherapy education, for example, as a new way to learn practical skills. According to research, use of digital technology would be beneficial to students learning such skills. In a recent systematic review, blended and distance learning designs including use of digital technologies were found to be equally or more effective compared with traditional teaching in physiotherapy education, for both practical skills and theoretical acquisition (Ødegaard, Myrhaug, Dahl-Michelsen, and Røe, 2021). Indeed, the evidence in this review related to learning skills through a combination of digital technology and in-person learning showed that for example interactive apps (i.e. mobile learning) and self-produced videos provided students with enhanced learning outcomes compared with traditional skills training. These digital technologies can be seen as active learning tools that can be applied in different phases of the learning process related to pre-, in, and after-class teaching. Furthermore, such ways of facilitating learning with digital technology provide opportunities for students' learning to be flexible in terms of time and place compared with in-class learning, where the teacher demonstrates skills. Although the teachers in our study expressed that they shared different learning materials (e.g. videos) with the students, none of them used, for

example, students' self-produced videos as a learning approach to support students' learning of skills.

Notably combining practical in-class teaching and for example students' self-produced videos of performing practical skills might promote higher skills acquisition compared with practical in-class teaching alone (Maloney, Storr, Morgan, and Ilic, 2013). An explanation of this effect is the ability to connect knowledge about practical situations, students' newly acquired knowledge and skills, and students' performance (Ødegaard, Myrhaug, Dahl-Michelsen, and Røe, 2021). Furthermore, using digital technology, such as self-produced videos, can give students the opportunity for peer learning by sharing, discussing, and giving feedback on the results both before and after in-class learning. Additionally, the possibility for self-reflection in the process of developing professional clinical skills is related to such use of self-produced videos. This example shows how digital technology has the potential to transform teaching by facilitating student active learning through pedagogical integration of digital technology, thus not just being a supplement to established teaching practices to learn practical skills.

In our study the teachers' use of digital technology primarily as a supplement to the existing syllabus might also be based on a need for more knowledge of the potential to facilitate learning in digital environments. In general, there is a need for more knowledge in relation to connecting students in network learning. Such network learning takes the form of discursive digital learning activities between students, interpersonal interaction using digital technology to strengthen the teacher–student relationship through engagement, and finally explorative learning activities with students acting as inquirers (Cutajar, 2019). In other words, the critical dimensions in digital technology implementation were not found in our study to relate to digital transformation in higher education. Indeed, giving the students possibilities to connect, interact, and explore in digital environments seemed to be an unfamiliar approach to the teachers in our study and could be interpreted as an absence of recognized pedagogical opportunities and the potential to support and contribute to students' active learning.

In the current study, some of the teachers had experiences with blended learning approaches, such as the flipped learning model. Although they expressed that this was a demanding model to plan and that it was challenging to facilitate alignment in pre and in-class learning activities related to time and resources, they expressed that this model had the potential to enhance students' learning outcomes from the in-class teaching. One of the advantages offered by the flipped classroom model is facilitation of pre and after-class learning activities with digital technology and in-class teaching involving learning activities in groups to support higher-order thinking, as the students are expected to have acquired basic knowledge from the pre-class learning materials. This model can be understood to be along a continuum with taxonomies from simple to complex and concrete to abstract knowledge and skills (Anderson and Krathwohl, 2001). Implementing these taxonomies in alignment when planning teaching and learning activities with digital technology has been shown to promote students' independence, analytical skills, and critical thinking, thereby demonstrating the potential to enhance learning outcomes for physiotherapy students (Day, 2018; Deprey, 2018; Røe et al., 2019) and to qualify graduates to be independent and autonomous professionals (World Confederation for Physical Therapy, 2011).

Despite the attention to the independence and autonomy required to be a physiotherapist, physiotherapy educators have been hesitant to implement digital education as a "knowledge transformation" approach with the learner at the center (Ødegaard, Myrhaug, Dahl-Michelsen, and Røe, 2021; Rowe, 2018; Unge, Lundh, Gummesson, and Amnér, 2018). Our study findings confirm this hesitance to implement digital education. Furthermore, the teachers' skepticism points to a potential knowledge gap for teachers regarding how digital education can support knowledge transformation within the physiotherapy profession. Filling this knowledge gap provides opportunities to use digital education to transform the established teaching practices into new practices in which digital technology is integrated into evidence-based pedagogical decisions in the teaching approaches.

The findings of our study also point to a need for applying learning sciences to provide a deeper understanding on how the use of digital education can facilitate active learning approaches in the teaching practice. Furthermore, they point to a need to strengthen pedagogical language to discuss learning and teaching design in the educational context. Language to discuss the science of teaching and learning is emphasized as critical for transforming physiotherapy education, that is, to create adaptive learners through advanced learning and by infusing learning sciences into all levels of education (Jensen et al., 2019). In other words, the lack of digital transformation as found in our study is seemingly deeply rooted in disciplinary/professional, cultural, and teaching beliefs. This is also seen in other disciplines (Kember, 1997; Lindblom-Ylänne, Trigwell, Nevgi, and Ashwin, 2006; Norton et al., 2005; Prosser and Trigwell, 1997).

Although the teachers were skeptical about digital education, they pointed out several factors in the educational context that, according to them, would have a positive impact on implementing digital education. That is, according to the teachers' experiences, enhanced collegial collaboration, more time to plan and learn, and significant academic leadership to guide and support would facilitate a digital transformation. Our study findings show how experiences with collaboration in development and facilitation of teaching and learning approaches resulted in teachers feeling more engaged and empowered in their teaching practices. Other studies have also pointed out that collaborative communities and relationships among teachers in higher education are important as arenas for professional development and that these dimensions influence a more student-centered approach to teaching (Fullan, 1993; Hargreaves, 1994; Vangrieken, Dochy, Raes, and Kyndt, 2015).

To further develop pedagogical and digital competence to explore pedagogical opportunities with digital technologies, the teachers in our study underlined the need for more time to work together. Hereby, they also expressed the need for support, digital infrastructure, and services in the institution. These findings are supported by another study emphasizing institutional infrastructure and strategy providing sufficient resources and guidance for effective implementation, staff attitudes and skills, and perceived student expectations (King and Boyatt, 2015). In our study, the teachers' own digital competence, together with the time aspect, were expressed as crucial to transform their teaching practices, in line with other studies and reports (Gudmundsdottir and Hatlevik, 2018; Kofoed, Wilhelmsen, and Ørnes, 2019). In the context of transforming the teaching practices, the academic leadership also plays an important role to enable changes related to emphasizing cultural perspectives in the educational context, including complex and relational challenges (Solbrekke and Stensaker, 2016). The teachers in the current study expressed the need for recognition, support, and clear expectations to experience that the leaders value high-quality teaching and student learning, and in turn as pointed out in another study to be positive to transform their teaching into student-centered teaching (Ramsden, Prosesser, Trigwell, and Martin, 2007). This understanding of conditions to design qualitative teaching is also seen in recent studies related to COVID-19 situations, emphasizing an *"individual and institutional understanding of learning designs and conditions important for generating online learning environments that meet the needs for the students"* (Damşa, Langford, Uehara, and Scherer, 2021).

Digital transformation of higher education is not just about implementing digital technology. A main goal is to adopt new ways of working together and to facilitate teaching and learning approaches to strengthen the focus on student active learning by integrating digital technology developed for educational contexts when appropriate. Pedagogical and didactical competence, digitally skilled teachers and students, and informed decisions in the teaching approaches are some of the characteristics of a digitally transformed higher education (Seres, Pavlicevic, and Tumbas, 2018). Our findings show that the teachers call for more academic leadership to transform the teaching and learning in physiotherapy education and to build professional learning cultures where high-quality teaching is valued. They want to know what their leaders are thinking regarding teaching and pedagogy, and there is a lack of expectations, commitment, and acknowledgment. We interpret the call for significant academic leadership as important in the process of transforming teaching and learning in physiotherapy education.

Teachers play a decisive role in the digital transformation of higher education. Their individual professional autonomy as teachers gives them freedom to maneuver in their teaching approaches, which in turn influences their contributions to long-term curriculum development. Consequently, as also shown in our study, teachers' disciplinary/professional, cultural, and individual views/ beliefs about teaching and learning are crucial and provide a basis for understanding that higher education provides the opportunity for an individual-oriented approach to digitalization among teachers, thus leaving digitalization in the hands of teachers' *"interest, values and preferences to point out the direction and milestones for development"* (Langseth, Jacobsen, and Haugsbakken, 2018). Without highlighting professional development through sharing and collaboration, a scholarly approach to teaching and learning, and significant leadership, the paradigm shift from transmission to participation and student active learning approaches integrating digital technology in higher education will remain individualized and slow (Bates, 2015; Bonwell and Eison, 1991; Børte, Nesje, and Lillejord, 2020).

Methodological considerations

The findings from a qualitative study cannot be statistically generalized; however, they can be analytically generalized (Kvale and Brinkmann, 2015), implying that the findings are expected to be alike in similar contexts. The current research was carried out in Norway, implying that the Norwegian culture,

education system, and physiotherapy teachers' approaches to teaching and learning were scrutinized. Similar studies in other countries and educational systems might thereby yield similar or other findings depending on the similarities of the contexts. In the recruitment process we paid attention to including participants with varied teaching experiences across higher education institutions and teachers that represented diversity in terms of age and gender. The sample however included only one man. Although men are underrepresented in physiotherapy education, we consider this a limitation of the study. The data were gathered before the COVID-19 pandemic. The pandemic introduced digital education on a large scale, and accordingly, the situation before and under the COVID-19 pandemic is very different with respect to the use of digital education. We argue that data collected before the pandemic are useful to shed light on how there might be many similarities between the situation before and after the COVID-19 pandemic. Future studies are needed to compare the situations.

Conclusion

This study illuminates how teachers' attitudes toward digital education involved skepticism, as digital education is regarded as contrary to practical and bodily learning, which is considered core in physiotherapy education. Teachers' experiences with digital education relate to their use of digital education as a tool to support the established practice. Thereby, the potential for a digital transformation of teaching and learning in physiotherapy education is restrained. The teachers themselves considered more teachers' collaboration, time to plan and learn, and significant academic leadership as prerequisites to a digital transformation of teaching and learning in physiotherapy. Taken together, the findings demonstrate a potential for digital transformation in physiotherapy education, which can be released by informing the current practice with evidence from research showing how use of digital technology pedagogically can improve teaching and learning in physiotherapy education for example by providing opportunities to integrate digital technology into the learning of practical skills. Future studies should investigate the views of physiotherapy teachers and teachers in other professional health education contexts on the pedagogical potential of digital education and their experiences with using digital education after the pandemic. Additionally, there is a need to explore what teachers consider prerequisites to a digital transformation of teaching and learning in physiotherapy after the pandemic.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was part of a PhD project funded by the Program for Research onDigitalization and Learning in Education at the Faculty of Health Sciences at OsloMet. Open access funding provided by OsloMet - Oslo Metropolitan University.

References

Anderson LW, Krathwohl DR 2001 A taxonomy for learning, teaching and assessing: A revision of bloom's taxonomy of educational objectives. (Complete), New York: Longman

Bates AW 2015 Teaching in a digital age. Vancouver BC: Tony Bates Associates Ltd: BC Open Textbooks.

Bonwell CC, Eison JA 1991 Active learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report No. 1, 1991. Washington, DC: George Washington University, School of Education and Human Development. https://eric.ed.gov/?id=ED336049

Børte K, Nesje K, Lillejord S 2020 Barriers to student active learning in higher education. Teaching in Higher Education 1–19. Online ahead of print. doi:10.1080/13562517.2020.1839746.

Braun V, Clarke V 2006 Using thematic analysis in psychology. Qualitative Research in Psychology 3(2): 77–101. doi:10.1191/1478088706qp063oa.

Braun V, Clarke V 2021 One size fits all? What counts as quality practice in (reflexive) thematic analysis? Qualitative Research in Psychology 18: 328–352. doi:10.1080/14780887.2020.1769238.

Car J, Carlstedt-Duke J, Tudor Car L, Posadzki P, Whiting P, Zary N, Atun R, Majeed A, Campbell J 2019 Digital education in health professions: The need for overarching evidence synthesis. Journal of Medical Internet Research 21: e12913. doi:10.2196/12913.

Cutajar M 2019 Teaching using digital technology: Transmission or participation? Education Sciences 9: 226. doi:10.3390/educsci9030226.

Dahl-Michelsen T 2015 Curing and caring competences in the skills training of physiotherapy students. Physiotherapy Theory and Practice 31: 8–16. doi:10.3109/09593985.2014.949946.

Damşa C, Langford M, Uehara D, Scherer R 2021 Teachers' agency and online education in times of crisis. Computers in Human Behavior 121: 106793. doi:10.1016/j.chb.2021.106793.

Day LJ 2018 A gross anatomy flipped classroom effects performance, retention, and higher-level thinking in lower performing students. American Association of Anatomists 11: 565–574. doi:10.1002/ase.1772.

Deprey SM 2018 Outcomes of flipped classroom instruction in an entry-level physical therapy course. Journal of Physical Therapy Education 32: 289–294. doi:10.1097/JTE.0000000000000035.

European Commission 2021 Digital education action plan (2021-2027): Resetting education and training for the

digital age. https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

Fullan M 1993 Change forces: Probing the depths of educational reform. London: Routledge Falmer Press.

Gudmundsdottir GB, Hatlevik O 2018 Newly qualified teachers' professional digital competence: Implications for teacher education. European Journal of Teacher Education 41: 214–231. doi:10.1080/02619768.2017.1416085.

Hargreaves A 1994 Changing teachers, changing times: teachers' work and culture in a postmodern age. London: Cassell.

Jensen G, Mostrom E, Hack L, Nordstrom T, Gwyer J 2019 Educating physical therapists. New York: SLACK Incorporated.

Kember D 1997 A reconceptualisation of the research into university academics' conceptions of teaching. Learning and Instruction 7: 255–275. doi:10.1016/S0959-4752(96)00028-X.

King E, Boyatt R 2015 Exploring factors that influence adoption of e-learning within higher education: Factors that influence adoption of e-learning. British Journal of Educational Technology 46: 1272–1280. doi:10.1111/bjet.12195.

Kofoed T, Wilhelmsen J, Ørnes H 2019 Digital Tilstand 2018 Perspektiver på Digitalisering for Læring i Høyere Utdanning. Rapportserie Nr. 6/2019 Direktoratet for Internasjonalisering og Kvalitetsutvikling i Høyere Utdanning [Digital State 2018 Perspectives on Digitalisation for Learning in Higher Education. Report Series No. 6/2019 Directorate for International Cooperation and Quality Development in Higher Education. https://diku.no/rapporter/digital-tilstand-2018-perspektiver-paa-digitalisering-for-laering-i-hoeyere-utdanning

Kvale S, Brinkmann S 2009 InterViews: Learning the craft of qualitative research interviewing. (2nd), Los Angeles, CA: Sage Publications

Kvale S, Brinkmann S 2015 Interviews: Learning the craft of qualitative research interviewing. (3rd), Thousand Oaks, CA: Sage Publications

Langaas AG, Middelthon AL 2020 Bodily ways of knowing: How students learn about and through bodies during physiotherapy education. In: Nicholls DA, Groven KS, Kinsella EA, Anjum RL Eds Mobilizing knowledge in physiotherapy: Critical reflections on foundations and practices, pp. 29–40. London: Routledge.

Langseth ID, Jacobsen DY, Haugsbakken H 2018 Digital professional development: Toward a collaborative learning approach for taking higher education into the digitalized age. Nordic Journal of Digital Literacy 13: 24–39. doi:10.18261/.1891-943x-2018-01-03.

Lillejord S, Børte K, Nesje K, Ruud E 2018 Learning and teaching with technology in higher education - A systematic review. Oslo: Knowledge Centre for Education. https://www.forskningsradet.no/siteassets/publikasjoner/1254035532334.pdf

Lindblom-Ylänne S, Trigwell K, Nevgi A, Ashwin P 2006 How approaches to teaching are affected by discipline and teaching context. Studies in Higher Education 31: 285–298. doi:10.1080/03075070600680539.

Maloney S, Storr M, Morgan P, Ilic D 2013 The effect of student self-video of performance on clinical skill competency: A randomised controlled trial. Advances in Health Sciences Education 18: 81–89. doi:10.1007/s10459-012-9356-1.

Norton L, Richardson TE, Hartley J, Newstead S, Mayes J 2005 Teachers' beliefs and intentions concerning teaching in higher education. Higher Education 50: 537–571. doi:10.1007/s10734-004-6363-z.

Ødegaard NB, Myrhaug HT, Dahl-Michelsen T, Røe Y 2021 Digital learning designs in physio-therapy education: A systematic review and meta-analysis. BMC Medical Education 21: 48. doi:10.1186/s12909-020-02483-w.

Prosser M, Trigwell K 1997 Relations between perceptions of the teaching environment and approaches to teaching. British Journal of Educational Psychology 67: 25–35. doi:10.1111/j.2044-8279.1997.tb01224.x.

Ramsden P, Prosser M, Trigwell K, Martin E 2007 University teachers' experiences of academic leadership and their approaches to teaching. Learning and Instruction 17: 140–155. doi:10.1016/j.learninstruc.2007.01.004.

Røe Y, Rowe M, Ødegaard NB, Sylliaas H, Dahl-Michelsen T 2019 Learning with technology in physiotherapy education: Design, implementation and evaluation of a flipped classroom teaching approach. BMC Medical Education 19: 291. doi:10.1186/s12909-019-1728-2.

Rowe M 2018 A critical pedagogy for online learning in physiotherapy education. In: Gibson BE, Nicholls DA, Setchell J, Groven KS Eds Manipulating practices: A critical physiotherapy reader, pp. 263281. Oslo: Cappelen Damm Akademisk AS.

Seres L, Pavlicevic V, Tumbas P 2018 Digital transformation of higher education: Competing on analytics. INTED2018 Proceedings 2018. Valencia, Spain: 9491–9497.

Solbrekke TD, Stensaker B 2016 Utdanningsledelse - Stimulering av et felles engasjement i studieprogrammene [Educational leadership - Stimulating a shared involvement in degree programs? UniPed 39: 144–157. doi:10.18261/.1893-8981-2016-02-05.

Unge J, Lundh P, Gummesson C, Amnér G 2018 Learning spaces for health sciences - What is the role of e-learning in physiotherapy and occupational therapy education? A literature review. Physical Therapy Reviews 23: 50–60. doi:10.1080/10833196.2018.1447423.

Vangrieken NK, Dochy F, Raes E, Kyndt E 2015 Teacher collaboration: A systematic review. Educational Research Review 15: 17–40. doi:10.1016/j.edurev.2015.04.002.

World Confederation for Physical Therapy. 2011 Guideline for physical therapist professional entry level education. https://world.physio/guideline/entry-level-education