

The Tension Field of Digital Teaching From the Perspective of Higher Education Teachers

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Abstract—The recent COVID Pandemic forced higher education teachers to come into contact with digital teaching and both positive and negative experiences have been made. Now, it is time to reflect on the advantages and disadvantages that have arisen as a result of digital teaching and what benefits the independence of location and time as well as the possibilities of digitization have yielded for teachers and students. An exploratory study was conducted to analyze perceptions of and opinions on digital teaching as well as statements about future teaching. For this purpose, 13 semi-structured interviews with higher education teachers and deans of studies at a large German university were conducted and analyzed using inductive categorization. As a result, four positions could be identified that describe the different perspectives of higher education teachers on the possibilities of digital teaching and the value of face-to-face teaching. When assuming a certain degree of heterogeneity among students, this results in a tension field of advantages and disadvantages for students, depending on the chosen teaching formats and preferences of the teachers. In this article, reasons behind these four different perspectives are given as well as recommendations for the future design of post-pandemic teaching.

Keywords—digital learning and teaching; higher education; digital accessibility.

I. INTRODUCTION

A German proverb (1829) reads:

“Allen Menschen recht getan, ist eine Kunst, die niemand kann.” (“To do right by all people is an art that no one can do.”)

What this means is that it is impossible to satisfy everybody involved or all affected parties equally. In the context of higher education, this dilemma is evident in the redesign of teaching following the pandemic-related university closures that were accompanied by a complete transition to online teaching. Both negative and positive experiences were made by teachers and students. So which path does one choose as a teacher after the pandemic?

The first reaction of many universities after the end of the full lockdown was to return entirely to on-site teaching. However, as experience reports show, this also has many disadvantages for students and teachers, and especially the aspect of (digital) accessibility [1] [2] [3]. The (forced) experiences with digital teaching, without the possibility to meet in presence, were perceived assessed very differently on several levels. With regard to study organization, flexibilization, study performance and learning

success, communication and interaction, motivation and competencies, both positive and negative experiences were made by students and higher education teachers [1]. During the pandemic, it also became clear that what is a relief for some can be a complication for others [4]. It can be seen that educators must operate in an area of tension with respect to post-pandemic digital teaching. Considering their own needs and the needs of a heterogeneous student body is a particular challenge. Although higher education recognizes the diversity of students as a given in its mission statements, in reality heterogeneous learning situations are rarely taken into account in the conception of teaching scenarios, or are only taken into account by teachers when students articulate individual needs and request support [2].

This paper analyzes in more detail the patterns of argumentation regarding the choice and design of teaching formats and scenarios that can be found among teachers and how they justify their decisions for and against digital teaching. Section 2 describes the conducted qualitative study, we asked about experiences during the pandemic related online semesters, about changing attitudes and possible reservations about digital teaching, and the advantages teachers see in digital teaching, in order to illuminate a possible area of tension caused by different needs and teaching requirements. This results in the following two research questions for analysis. In Section 3, the findings from the interviews conducted are presented in detail:

- RQ 1: What reservations do higher education teachers express about digital teaching and how does this impact the future conception of their courses?
- RQ 2: What advantages do teachers see in digital teaching and what should be retained after the pandemic induced online semesters?

II. METHODOLOGICAL APPROACH

In order to answer the research questions, a total of 13 individual interviews were conducted with teachers from a large German university. Eight interview partners were from faculties of the natural sciences and medicine, three from social sciences, and two from the humanities. Among the 13 interview partners, 10 were simultaneously acting deans of studies of their respective faculties. The guiding questions were slightly modified for this group of persons. The individual interviews were conducted between 07/01/2022

and 08/02/2022 via videocall using Zoom videoconferencing software. To ensure the anonymity of the interviewees, no further personal data was collected.

The interview procedure chosen was the problem-centered interview according to [5]. This method tries to let interview partners speak as freely as possible to come as close as possible to an open conversation. At the same time, however, the interview is oriented toward a previously determined problem, the details of which are compiled in advance in an interview guide. For the conducted study, two guides for research questions were developed (deans of studies and higher education teachers). To avoid the interviewees formulating their assessments of reservations and advantages of digital teaching too broadly or too abstractly, they were asked to describe their experiences and impressions from different phases of the COVID-19 pandemic in each case. This is reflected in the wording of the questions in the interview guides, which respectively refer to the lockdown phase of the pandemic with Emergency Remote Teaching [6] and the post-pandemic phase, in which teaching returned to a "New Normal" [7]. The two interview guides included the following questions:

Interview guiding questions for deans of studies

- How did faculty members perceive virtual teaching during the past three online semesters? Are the teaching experiences from this time viewed more positively or negatively? To what extent? / What do you think are the reasons for this?
- In your estimation, inasmuch did the Corona pandemic change attitudes toward digital teaching among faculty members, if at all?
- What were the reactions of faculty members this semester when the "back to on-site teaching" tendency emerged?
- What reservations about digital teaching do you currently perceive on behalf of the faculty? (technical problems, social problems, didactic limitations, etc.). In your estimation, to what extent are these reservations related to the experiences from the Corona semesters?

Interview questions for teachers

- How do you assess your experiences with digital teaching during the past Corona semesters? What are the reasons for your assessment?
- What negative effects of digitalization processes in teaching do you see? What kinds of downsides emerge from them?
- Has your attitude towards digital teaching changed as a result of the pandemic? In what way?
- Have you used digital teaching practices, methods and tools from the Corona semesters in this semester? - If not, what are the reasons for this?

The recorded interviews were automatically transcribed with the software Amberscript and completely anonymized so that no more conclusions can be drawn about persons or subject discipline. Subsequently, the material was analyzed in a Qualitative Content Analysis (QCA) according to

Mayring (2015) with the software QCAMap [8]. An inductive evaluation method was chosen, in which the category system is developed from the material concurrently with the analysis and evaluation process, guided by the research questions. The coding of the interviews was done in an inter-coder procedure with two coders each. The reliability of the overall result was ensured by checking all codes during an evaluation conference with all four coders. In this session, major categories were also formed from the individual categories, which are described in the following section.

III. RESULTS OF THE QUALITATIVE CONTENT ANALYSIS

The qualitative content analysis of the transcripts was conducted along the two research questions RQ1 and RQ2 (see Section 1) and the results are presented separately below.

A. Reservations about digital teaching (RQ1)

The reservations about digital teaching expressed by the teachers in the interviews address social, didactic, organizational and technical aspects. The statements of the teachers were assigned to a total of 56 different subcategories, which in turn can be summarized in 10 main categories [9]. A selection of the most relevant categories will be discussed in more detail in the next section.

1) Social aspects: Lack of contact and absence: Frequent concerns expressed by teachers about digital teaching relate to social aspects of the teaching-learning process, such as a lack of social contact, insufficient contact with the subject and also (physical) absence from the learning location. The interviewees complain that there is no direct contact in online scenarios (RQ1-1) and thus no real discourse and dialogue as well as no sufficient interaction (RQ1-2). Interview partner 3 (IP03) describes it like this:

“Even in the lectures we try to include as many practical elements as possible. And even if it’s just a matter of discussing problems and getting the students involved in the dialogue, so to speak, so that they have to think about it and follow the train of thought and not just sit there and let it wash over them. Of course, that doesn’t work in the digital world.” (IP03)

Digital teaching would also lack the spontaneous small talk before and after the lecture (RQ1-23). As online lectures end abruptly, student communication is assumed to suffer (RQ1-39) due to a lack of opportunities for exchange, discussion and reflection (RQ1-24, RQ1-25). This is regretted by interview partner 5:

“On the way to the seminar, they talk about the content of the seminar, as well as about the lecturer. But they reflect in the process. This reflection is lost.” (IP05)

2) Pedagogical-didactical reservations and motivational aspects: Some of the reservations expressed in the interviews relate to the didactic design possibilities of digital teaching. In the eyes of some interview partners, these are less effective than those available in face-to-face teaching (RQ1-36). Likewise, the willingness and ability of students to

perform presumably decreases in online teaching (RQ1-12). Several of the interviewees also point out that digital teaching-learning formats are didactically flawed and generally do not correspond to their ideas of "good" teaching (RQ1-11). Interview partner 6 says, for example, videos would tend to prevent engagement with texts (RQ1-38):

"To understand the digitisation of teaching as a bit of an alternative to text-based teaching, so to speak, in the direction of, let's say, video or audio content, that would also be a problem from our specialist point of view" (IP06)

Teachers are also dissatisfied with the didactic possibilities of the existing systems. In their opinion, the systems and tools are not very appealing in design and could be more playful (RQ1-31). Teachers also perceive the "digital divide" associated with online teaching as problematic, i.e. the effect that high-achieving students benefit more from digital teaching than lower-achieving students, who tend to be disadvantaged by the use of online teaching (RQ1-53). Interview partner 8 describes their experience as follows:

"I think that to those who are good didn't matter that much because they dealt with it well. But those who are not so good, you lost them to a certain extent because you couldn't nudge them directly." (IP08)

The respondents attributed this effect to the fact that lower-performing students in particular were less motivated in online teaching (RQ1-10). Due to the lack of scheduled learning opportunities in presence as well as the lack of social exchange, students partly lose the structure for their daily study routine (RQ1-47) and learn less as well as less independently (RQ1-42).

3) *Organizational and legal barriers:* In addition to concerns about the didactic reservations of digital teaching, the interview partners also mention organizational and legal reservations about the increased use of virtual and hybrid teaching formats. Digital teaching is above all time-consuming (RQ1-5) and expensive (RQ1-32), as teachers sometimes have to familiarize themselves with new tools first (RQ1-45), must first create or prepare additional materials or provide additional online support. According to the interviewees, the additional workload then leads to work intensification and deadline pressure (RQ1-27). Teachers see it as particularly problematic that the amount of work they invest in producing and supporting additional digital courses is not remunerated (RQ1-37). Interview partner 6 said:

"Well, I'm basically doing face-to-face teaching, but I'm also doing a lot of nice digital stuff on top of it, a bit of personal commitment that you do because it's close to your heart. But the effort is somehow not compensated in a certain way." (IP06)

In addition to the extra effort, respondents also raise legal concerns about the use of digital teaching. For example, Interview partner 3 argues that online is rarely compatible with legal regulations such as the licensing regulations for medical professions (RQ1-18):

"If we do not return to real practical content, we are not educating future doctors properly. That is a

very clear fact. So we are in breach of the licensing regulations, so to speak, if we continue to keep them away from the hospital bed." (IP03)

Last but not least, respondents also fear that their digital course material will be distributed uncontrolled and illegally on the web (RQ1-13).

4) *Technical barriers:* The implementation of digital teaching is inextricably linked to the use of different digital tools, systems and technologies. Thus, various reservations are also mentioned in the interviews that are closely related to the use of technology as well as the specific characteristics of the respective technologies used. In addition to infrastructural problems such as an inadequate WLAN connection (RQ1-54), the usability of the available digital systems is criticized as being inadequate, especially for "beginners" and digitally less inclined teachers (RQ1-9). Interview partner 10:

"Where the eLectures are recorded and where you can also upload things yourself as a user. [...] I also used that once, I have to say at the beginning, and then found it complicated after all." (IP10)

It is often the university's own systems that do not work well (RQ1-46). Another reservation is the fact that some technological solutions (such as AR or VR applications) offer didactic advantages, but cannot be used properly on a broader scale at present (RQ1-19) as interview partner 3 argues:

"VR is indeed quite nice, but as I said, it is still a long way from being usable for all students. There are not enough devices." (IP03)

In addition to these points, which relate more to the teachers themselves, the interviewees also bring up technical barriers on the part of the students that limit or even prevent their participation in digital teaching. First and foremost, an insufficient internet connection of the students is mentioned (RQ1-17) as well as a general uncertainty of the teachers due to the technical challenges on the part of the students (RQ1-41).

5) *Personal reservations and lack of teaching skills:* While the reservations about digital teaching described so far tended to be of an external nature, the respondents also mentioned internal reasons. These include, on the one hand, personal sensitivities and preferences of the teachers, but, on the other hand, also their own teaching competence levels, which are perceived as insufficient. The personal reservations mentioned include fear of the unknown (RQ1-49) or the uncomfortable feeling of communicating with students via camera and microphone (RQ1-40). For example, interview partner 12 reports that

"the tiles were black, and speaking to a black screen, especially in the first semester, for example, was considered by many to be very unusual or difficult to get used to and not very advantageous." (IP12)

Furthermore, some teachers have the opinion that a majority of their colleagues would prefer face-to-face teaching to online teaching (RQ1-34) or they themselves could not imagine teaching online (RQ1-48). However, there were also complaints about the lack of support from the university, especially with technical problems (RQ1-51), which prevented

them from incorporating more digital elements into teaching. Interview partner 11 is disillusioned, given that

"the technical support was rather poor and we had to work out a lot on our own." (IP11)

Last but not least, the teachers also surveyed a lack of competences as a reason for not offering more digital teaching. The main reason cited here is the lack of digital skills among teachers (RQ1-4), which made it difficult to deal with the tools needed, as interview partner 5 explains:

"Of course, there were enormous difficulties in dealing with a digital format, for example. So how do I actually do an online session or something?" (IP05)

Similar problems in the use of technologies for digital teaching are described by interview partner 2:

"But I have no idea how to create these videos in a visually different way and maybe put them on another page. [...] Or what is a Scorm learning content. These are all things that you normally have no idea about" (IP02),

and interview partner 13

"How does zooming work? What is the best way to do it? [...] There was a lot of uncertainty on all sides." (IP13)

A lack of didactic skills is also cited as a further obstacle to the more extensive use of digital teaching (RQ1-20). Interview partner 5 recognises the greater deficit here.

"For me, it was relatively clear that the know-how was still lacking on the part of the teachers, both from a didactic and a technical point of view. Above all from a didactic point of view." (IP05)

In addition to the competence deficit, the interviewees also mention the problems caused by the introduction of new technologies (RQ1-6) and insufficient guidance and instruction on new digital systems as further barriers to the use of digital teaching (RQ1-52).

B. Advantages of digital teaching (RQ2)

In addition to the reservations, the teachers were also asked in the interviews about the advantages of digital teaching. In their experiences, teachers report on the pedagogical-didactical and technical-organizational advantages of digital teaching as well as positively perceived effects on students' motivation and learning success. In addition, they talk about advantages that compensate for individual disadvantages, as well as about increasing their own digital skills. The statements of the teachers were assigned to a total of 26 different categories, which in turn can be summarized in six main categories [10].

1) *Pedagogical-didactical, motivational and performance-related advantages*: The temporal and spatial flexibility of digital, asynchronous teaching (RQ2-7) in connection with the possibilities of uncomplicated repetition of the learning materials at one's own learning pace (RQ2-8), also for the preparation and follow-up of synchronous phases, are repeatedly mentioned in the interviews as advantages and a way to self-determined learning. The following two

statements are representative of several statements about these advantages:

"So some like it, appreciate it very much, that they can schedule things themselves, that they can work independently at home, when they want to." (IP11)

and

"Asynchronous elements, especially now, when students are supposed to work on their own, alone or in study groups or so, you can design that well or even better with virtual tools." (IP12)

Teachers also perceive that digital teaching is popular with students (RQ2-4), motivates students (RQ2-22), and contributes to learning success (RQ2-3). Students' desire to have digital teaching as a choice is reported several times. Representative of this apparently frequently expressed wish are the following two statements:

"Can't we also have the material virtually as well?" (IP01)

and

"With students you also hear more often that they really want to have a choice, face-to-face or digital. For different reasons, personal reasons." (IP09)

In addition, the high motivational effect of digital teaching was also reported during the pandemic:

"They all turned on their cameras and they had a very intense exchange that 30 minutes were usually not enough for because everyone was so engaged in it." (IP05)

And they also perceived an increase in performance among some students, as interview partner 4, among others, states:

"We've made the observation that high-performing students actually show performance improvement from online teaching." (IP04)

For the future design of teaching, teachers take with them the insight from pandemic times that the mixture of digital and face-to-face offers is important, (RQ2-23) as the following quote of interview partner 9 illustrates:

"We cannot replace face-to-face teaching with digital offers, but only expand and supplement it. That's something that was a clear takeaway." (IP09)

In this context, the development of one's own competencies (RQ2-14) and the further development of one's own teaching (RQ2-1) were also perceived as positive effects of the pandemic, as described by interview partner 10 and 2 as representative of several statements in this direction:

"But I have now become acquainted with many more opportunities and possibilities. In this respect, the attitude has changed a little. I think so, because now I will also use blended learning formats more readily. And in this respect, it has changed somewhat, because I now take the opportunity more easily or more frequently, even in a seminar that does not take place virtually, but to incorporate real work phases that use virtual tools." (IP10)

and

"So the bottom line after the three semesters, I would say, among the colleagues the vast majority or a great majority have found this to be an enrichment. And as yes [...] now looking back at the possibility to develop one's teaching further." (IP02)

With regard to the further development of their own teaching, teachers also emphasize that the analysis of data generated by digital teaching could be used for a more precise didactic evaluation (RQ2-16).

2) *Organizational advantages*: In the interviews, a whole series of arguments for digital teaching came up, which concern advantages for the organization of teaching. Emphasis is placed on the easier and increased provision of learning content (RQ2-18) and recordings (RQ2-6), temporal and spatial independence (RQ2-13), and the reusability of digital materials (RQ2-2). For some programs, such as teacher education, these organizational advantages are of particular importance, as interviewee 05 makes clear:

"I have a lot of teacher trainees who have a lot of problems with overlap in their curriculum. For them, of course, it was a blessing that now in the lecture, that they can also participate asynchronously." (IP05)

In addition to making it easier for students to organize their studies, teachers also see advantages of digital asynchronous teaching for their own work (RQ2-24):

"Yes, because of course it gives teachers the opportunity to create new freedom for themselves through the asynchronous offers." (IP09)

The initially high effort to produce digital materials is now, after the creation seen as an advantage for students and as a relief for themselves, as interviewee 08 states:

"And I now have digital materials for all three semesters. If I teach this course again, then in principle I could profit from it or I would profit from it, then I could make all the digital things that I already have, I could then make them accessible again. And then, of course, that's very luxurious for the students." (IP08)

3) *Advantages of digital teaching that compensate for individual disadvantages*: Two interviewees also describe aspects of digital teaching that can reduce individual disadvantages for both students and teachers. With the help of digital teaching, teachers with health risks due to the pandemic were still able to offer and conduct courses (RQ2-25). In addition, one interviewee also perceives benefits for students whose personality traits allow them to overcome disadvantages of face-to-face formats through digital teaching (RQ2-26):

"And yes, there are students who find it convenient when they can turn off their camera and then speak quasi-anonymously." (IP12)

IV. DISCUSSION

The results show that, after the experience of the pandemic, some teachers emphasize the desire for on-site teaching and the associated direct contact with students and colleagues. This

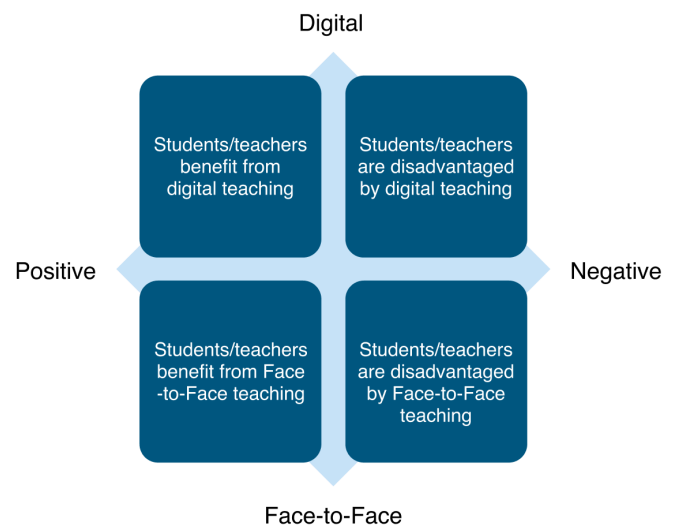


Fig. 1. The Tension field of digital and face-to-face teaching. The four positions of a teacher's view on the benefits and disadvantages regarding both settings.

goes hand in hand with teachers' concerns and reservations about digital teaching. Besides the pedagogical and didactic difficulties of digital teaching, they also see motivational and performance-related problems. In addition, there are personal reservations in connection with their own lack of competence and perceived organizational, technical or legal hurdles. On the other hand, however, some advantages of digital teaching are also perceived, for example with regard to motivation, pedagogical-didactical possibilities and potentials, and organizational facilitation. These different perceptions are not necessarily contradictory, but rather reflect the individual situation and perspective of teachers and students. There is a tension between the advantages and disadvantages of face-to-face and digital teaching, which poses a dilemma for the design of teaching (which is shown in Figure 1). Advantages of a format for some may represent disadvantages for others.

A. The Tension field of digital and face-to-face teaching

In addition to aspects of isolation and loneliness or difficulties for lower-performing students, the perceived disadvantages of digital teaching relate primarily to the lack of direct exchange and dialog with students. This perception leads to a strong desire on the part of some teachers to return to the former face-to-face teaching formats rather than to maintain digital ones. This reaction risks overlooking the fact that "back to face-to-face" may well be associated with disadvantages for some students and teachers. Assuming a broad understanding of heterogeneity, respectively diversity [11], in which heterogeneous (learning) starting points are acknowledged, with different prior knowledge, interests, cognitive abilities, motivations as well as social and cultural backgrounds of students, digital elements play an eminently important role with regard to diversity-sensitive, inclusive teaching. Disadvantages of a purely verbal and fluid face-to-face teaching offer arise, for example, for students who have difficulties following due to auditory perception

disorders, physical hearing impairments, reading/spelling difficulties, grief or ADHD/ADS [2] or have problems actively participating in presence due to shyness or anxiety. Advantages of digital teaching can provide significant support. A continuous asynchronous learning offer or the possibility to make use of it in addition to face-to-face teaching would be very helpful for these students. For example, students with reading and spelling difficulties have enough time to read texts, use reading programs and apps for written assignments, and enter their own written submissions, e.g., via Readspeak, and have them automatically checked for spelling and grammar. In the case of concentration difficulties or simply different discussion and learning speeds, an asynchronous learning offer can provide relief by allowing contributions and tasks or asynchronously conducted discussions to be worked on autonomously at one's own pace or in smaller units, so that the working memory is less burdened. In addition, for some students in special life situations, e.g. when they are prevented from attending due to illness, parenthood or other care work, a continuous asynchronous learning offer makes it possible to maintain their studies in the first place.

V. CONCLUSION AND FUTURE WORK

The qualitative study identified four positions that can be used to describe the tension between the perspectives of which teachers view the specific opportunities and threats of digital teaching and face-to-face teaching (see Figure 1). In the future, these different perspectives must be considered on two levels when designing contemporary teaching. For one, on the institutional level, in strategic decisions about the goals and orientation of academic teaching at the university. For another, on the individual level of the single teachers, in the planning and realization of their own teaching, but also in the reflection of their own teaching activities. In this context, it will be crucial to always have different possible solutions in mind in a multiperspective sense and to choose solutions that take several of these positions into account and lead to a synthesis through dialogue [12]. Interview partner 9 also argues in favor of such an approach by speaking out against thinking in either/or categories:

"So it's neither a demonization of digital possibilities, but also not a clear prioritization of face-to-face presence. Yes, perhaps not just prioritization, but really the mix, it's the mix that makes it. Both have their place, digital teaching, face-to-face teaching, and you can't replace one with the other."

In the future more research is needed to further explore this tension field of digital teaching. On the one hand, the perspective of the students is important, whose needs and wishes must be taken into account when designing digital teaching. On the other hand, the group of persons with special needs due to e.g. visual, hearing or motor impairments or with care work is interesting. Even if all students (and teachers) benefit from digital accessibility in principle, it is this group whose needs should be given special attention. Further work will focus on the question of how university teaching

can become more inclusive by incorporating the possibilities of digitization [2] and in what form the multi-perspective approach described can support this process. One approach could be the creation, systematic preparation, and distribution of learning designs for inclusive, digital teaching. These patterns, which require both individual teachers (individual level) and institutes for academic development (institutional level) to create, would provide teachers with a valuable source of inspiration for designing contemporary teaching.

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