How do We Conduct Teaching at Universities in the Future? A Study Illustrating How, Where, and Why Teachers and Students Disagree About Hybrid Teaching Formats

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Abstract

This empirical study investigates students' and teachers' preferences and experiences with hybrid teaching formats at the university level. In the presented teaching format, students and teachers attend sessions either on campus or online. Some students always participated from campus, others changed between campus and being online. The research shows surprising insights: students and teachers clearly disagreed about the experienced usefulness of the hybrid teaching formats, and whether to use hybrid teaching formats in the future. Out of 849 respondents, app. 80% of teachers prefer to teach at campus, app. 80% of students want the hybrid solution, despite the technical and pedagogical issues encountered. Findings show a need for the development of hybrid pedagogies and didactics preparing teachers for teaching in hybrid teaching formats and point to the need for a more general discussion about how universities and society at large want to conduct teaching in higher education in the future.

Keywords: hybrid teaching formats, higher education, university governance, future teaching practices, pedagogies, hyflex

1. Introduction

Since March 2020, several societal lockdowns due to the COVID-19 pandemic have significantly impacted educational institutions and teaching methods. In the fall of 2020, universities across Denmark, including Aalborg University (AAU), experienced a partial lockdown, limiting the number of students allowed on campus. The partial lockdown led to the implementation of various hybrid teaching formats. AAU investigated the experiences students and teachers had with these hybrid teaching formats across five faculties: humanities, social sciences, engineering and science, IT and design, and medicine. This study explores both the technological and pedagogical aspects of the hybrid teaching formats applied at AAU. The findings reveal notable differences in attitudes and needs between students and teachers.

This study can be seen in continuation of Lundberg & Stigmar (2022), who in the Scandinavian Journal of Educational Research published an explorative qualitative study (n=22) on teachers view of what constitute a successful learning environment. They found that though university teachers shifted to more positive attitudes toward digital and distance teaching, teachers remained sceptical concerning, what they call technologically enhanced on-campus learning environments. The authors states that hybrid learning environments is potentially growing, and this scepticism poses a challenge.

This paper provides a mixed method study with 849 teacher and student respondents. Significantly, the study found that teachers generally prefer on-campus teaching or a clear separation between on-campus and fully online formats. In contrast, students prefer to have the flexibility to choose between attending classes on campus or participating online and thus appreciate the hybrid format. Teachers often felt that hybrid teaching negatively

impacted their teaching quality, whereas students expressed satisfaction with the education they received. Post-COVID-19, there are varied attitudes towards hybrid teaching formats. Many teachers feel overwhelmed and somewhat saturated with hybrid teaching. The findings from this study may be somewhat controversial in a debated field that is characterised by opposing opinions. However, the data highlight a significant difference in attitudes towards hybrid teaching between students and teachers. Roughly 80% teachers answers that they prefer to teach face-to-face on campus and similarly approximate 80 % of the students would like to attend hybrid teaching in the future. This research underscores the need for a broader discussion on the future of educational approaches and teaching methods that universities and society should support. In this paper, current research is discussed in view of the data analysis and findings of the study.

1.1 Literature on Hybrid Teaching Formats

To better understand the differing perceptions of hybrid teaching, this section presents an overview of key definitions and findings from studies found in the literature on hybrid teaching formats. The aim is to explore existing research on hybrid learning, its pedagogical implications, and how it has been received by educators and students alike.

The COVID-19 pandemic has given renewed focus to hybrid teaching formats and reason to further explore, extend, and define our understanding of these formats (Eyal & Gil, 2022). A clear and precise definition is difficult to find, as the term hybrid is used in various ways depending on context and spans different understandings and uses of the concept. Some uses of the hybrid format are defined as being synchronous, while others place emphasis on asynchrony. This study views the hybrid teaching format as a synchronous teaching situation that combines simultaneous face-to-face and mediation via video conference/live streaming, which in Bülow (2022) is called synchronous hybrid teaching. According to Raes et al. (2019), who in their review of existing research on the knowledge of synchronous hybrid teaching refer to, for example, Szeto and Cheng (2016), Butz et al. (2016), Hastie et al. (2010), and Weitze et al. (2013), the hybrid teaching format is defined as a technological framework in which technology makes it possible for students to participate in classes on campus or wherever they want. Others emphasize that hybrid formats have a pedagogical framework that provides students with the freedom of choice (Beatty, 2019A), and which is not necessarily an educational ideal (cf. Eyal & Gil, 2022), but a way to give each student "*equal opportunity to participate with ample flexibility*" (Eyal & Gil, 2022, p. 15). The study in this paper captures both perspectives, investigating both the pedagogical and behavioural implications of the hybrid teaching format.

From the perspective of specific cases from practice and of how the students experienced these, one of the central aspects of the hybrid teaching format is the choice of whether to participate on campus or online (Beatty, 2019A). Students prefer flexibility, and the format recognises that students have different needs and preferences for participation (Wright, 2016) and makes their choice of participation based on convenience (Beatty, 2012; Blankson et al., 2014, cited in Wright, 2016). Wright (2016) reported an empirical study using a hybrid format called HyFlex (as defined by Beatty, 2019A). Here, it was found that students experienced learning just as much in this HyFlex format as in a more traditional teaching format (95% of 186 students answered *strongly agreed* or *agreed* with learning as much as they expected). However, in general, the hybrid teaching format may require more self-discipline by the students (Wiles & Ball, 2013 in Raes, 2019). The format also has different pedagogical challenges, as described in Raes et al. (2019), such as students experiencing feeling excluded when participating online in a hybrid format (Huang et al., 2017 in Raes et al., 2019) and the students can also feel inactive (Raes et al., 2019, primarily with reference to Weitze, 2015).

Considering how teachers experience the hybrid teaching format, Raes et al. (2019) (citing Bower et al., 2015; Ørngreen et al., 2015; Zydney et al., 2019) pointed out that teachers have a greater mental load and a hyper-zoom or hyper-focus. Teachers often find it difficult to activate students in hybrid formats, but interestingly, they also tend to use the hybrid space for monologue/lectures (Raes et al., 2019 primarily with reference to Weitze, 2015). According to Bülow's (2022) study in primary schools, it is impossible for the teacher to establish close connections to both students participating online and students participating in the classroom at the same time. However, another case by Klunder et al. (2022) describes how the hybrid teaching format can support continuity of education for people who are chronically ill, can restore social ties, and that these findings are transferable to other primary school contexts. In the hybrid teaching format, students can take on more roles, as suggested by Zydney et al. (2019) (as cited by Raes et al., 2019), such as 'chat tracker' and 'technology troubleshooter', thus alleviating some of the mental load and hyper-focus difficulties experienced by the teachers. Bülow (2022) also pointed to a particular need to rearrange the social organisation of the learning design to address this issue. In addition, Raes et al. (2019) described the pedagogical challenges in creating a learning design that is considered meaningful for the teacher, creates a sense of co-presence and provides useful learning experiences (Raes et al.,

2019, referencing Cain et al., 2016 and Bower et al., 2014). Similar perspectives were offered by Jelsbak et al. (2018).

Flexibility in terms of accessibility and reusability are some of the potential benefits that the organisation surrounding education can gain from utilising the hybrid teaching format (Beatty, 2019A; Raes et al., 2019). Offering equal educational opportunities and a better possibility of balancing job and family when attending higher education, the hybrid teaching format has the potential of being at a better match and reflection of modern society and the "multi-faceted student population" (Raes et al., 2019, referencing Lakhal et al., 2017; Lightner & Lightner-Laws, 2016; Wang et al., 2017; Wiles & Ball, 2013). However, the organisation must work "*patiently within the same parameters*" (Beatty, 2019B) to implement the hybrid teaching format evenly across the organisation. In terms of technology, sound quality is essential, especially for students participating online. Further, teachers find it creates a certain pressure when they are not able to see or sense the online students (Bower et al., 2015; Cunningham 2014; Weitze et al., 2013; Zydney et al., 2019, all in Raes et al., 2019).

Most of the literature looks at specific interventions or courses, only a few looks at entire programmes or educations (see e.g., the literature review in Raes et al., 2019), and no examples have been found of systematic research on the practice of an entire university. However, a vast number of papers have been published in these years from the COVID-19 pandemic, offering a broader outlook on these issues, and primarily covering fully distributed online formats.

In Denmark, Lyngdorf et al. (2021) and Georgsen and Qvortrup (2021) investigated students' and teachers' experiences and attitudes towards hybrid formats in fall 2020. They identified that much of the teaching was "emergency teaching," which had pedagogical barriers and problems associated with the technology, the teachers' experience in using technology, and roles and responsibilities. Lyngdorf et al. (2021) pointed out that the emergency teaching was an inferior alternative to physical attendance, but in the study, the students and teachers were not asked what they generally preferred. Georgsen and Qvortrup (2021, pp. 12–13) found that 65% of teachers were positive towards including more online technology in teaching, but 68% of teachers were not interested in reducing physical attendance. Similarly, 62% of the students were not interested in cutting down on physical attendance. However, these studies did not uncover experiences and attitudes towards the flexibility of choice and its pedagogical and behavioural consequences, as perceived by the students and teachers.

2. Research Question, Context, and Method

This paper is an empirical case study of the students' and teachers' experiences with the hybrid teaching formats that were utilised during the fall of 2020 across AAU faculties. As seen in the literature review, this teaching format has both potential and challenges. The following section introduces the research context, research question and methodological approach used in this study.

2.1 Research Context

The investigation was initiated based on a request from the Audio/Visual and Video Conference system management steering group at Aalborg University, Denmark.

Established in 1974, AAU employs approximately 3,800 staff and approximately 20,000 students across four faculties—social science and humanities, engineering, and science, medicine, and IT and design—in three locations across the country. At the time of the study, there were five faculties, as social science and humanities were two entities. AAU applies the problem-based learning (PBL) model (Askehave et al., 2015; Barge, 2010; Sipes 2017) as its pedagogical approach, in which student learning is based in real-life situations and often collaborates with external organisations, like what Sipes (2017) denoted 'authentic problems'. Addressing a specific practical situation, students define a problem (or opportunity) to be perceived and reflected upon through projects, utilising the curriculum of the education, and getting supervision in the process. An investigation into hybrid teaching formats therefore needs to cover both traditional teaching formats (such as lectures) and more supervision-based formats.

At AAU, a hybrid teaching format was implemented in the fall of 2020 to accommodate the restrictions due to the partial lockdown, with limits on how many students were allowed to attend class on campus. A few students had to stay at home during the whole period due to being at-risk persons, while other students were given a choice to participate on campus or online, and yet other students were placed in groups that had alternating periods/days, that is, pre-scheduled days with campus or online participation. These variations were decided on a study programme or department level and depended on room sizes, organisational challenges, and administrative considerations. Furthermore, synchronous and asynchronous online participation was offered to the students in the fall of 2020, and some classes were recorded and could be watched by students at any given time; others were

done in a synchronous format that required attendance at a specific time. It was primarily up to the individual teacher to decide whether to record the classes.

2.2 Research Question and Choice of Method

The research investigates how students' and teachers' perceptions of hybrid teaching formats differ, and what the key factors influencing these perceptions are. The research takes point of departure in an empirical case, which is interesting because it examines the practice of an entire university across faculties. This empirical study can be categorised as a paradigmatic case uncovering new knowledge and creating a new understanding of the phenomenon (Flyvbjerg, 2006), that is, the practice and implementation of a hybrid teaching format.

The research questions investigated are:

1. How do students' and teachers' perceptions of hybrid teaching formats differ at AAU during the fall semester of 2020, and what are the key factors influencing these perceptions?
2. What implications could these results have for the future organisation of teaching in higher education?

When considering the choice of method for the study, there was a need to see patterns across the data, with respect to simple statistical variation in frequency, based on a broad foundation (data spanning different programmes, educational levels, and class sizes). The aim was not to conduct a complex statistical instrument, but rather to see overall patterns. However, the study also aimed for qualitative data that were nuanced and provided rich descriptions and experiences from both teachers and students. The study considered using questionnaires, as they can easily be distributed and answered by many people, although they are often interpreted as primarily quantitative when consisting of a large volume of data and respondents. Creswell has shown how mixed methods research can offer impressions of patterns through quantitative data and to understand the reasons behind the patterns through qualitative data (e.g. Creswell, 2008). Rivano et al. (2017) supported this by highlighting qualitative questions in questionnaires as a data collection method that can generate rich data consisting of memories, opinions, and experiences. Therefore, a mixed-mode questionnaire was used based on a cross-sectional type of questionnaire (Creswell, 2008).

2.3 A Mixed-Mode Questionnaire

The design of the qualitative part of the questionnaire made it possible to obtain detailed, nuanced, and rich answers from all of AAU programmes (35 bachelor's programmes and 39 master's programmes (full and part-time programmes). The quantitative part asked for answers in categorical and interval/ratio questions yielding data on the use of the hybrid teaching format. Though it is possible to go into details and the analysis do cross-reference the answers with the educational programmes and faculties, to see patterns of interest, in this paper the results are disseminated on a high-level approach, based on students' and teachers' attitude towards the hybrid format, without making any differentiation depending on the applied pedagogical format. As will be seen later, this is possible because of the significant difference in attitudes. The mixed-mode questionnaire and the dissemination here, does however contemplate the pedagogical changes and adjustments' that the teachers made on a general level, as well as how the respondents experienced the format worked / did not work. The questionnaire underwent pilot testing before distribution.

The questionnaire was relevant only for the students and teachers who had participated in courses or taught using the hybrid teaching format. The central administration did not have exact information about who participated in the hybrid teaching format. Therefore, the questionnaire was mailed to all study coordinators who made a pre-selection based on their knowledge, and the questionnaire itself had an initial question that assessed whether the respondents had this experience. The table below shows the number of responses for the distributed questionnaire.

Table 1. Responses to the questionnaire, fall 2020

	Patial – yes to participating in hybrid teaching	Complete – yes to participating in hybrid teaching	Total responses – yes to participating in hybrid teaching	No to participating in hybrid teaching
Students	145	521	**666**	95
Teachers	31	152	**183**	56
TOTAL	176	673	**849**	151

The partial responses have been included in the dataset. First and foremost, they contributed to the population, as they confirmed having participated in courses or taught using the hybrid teaching format. Secondly, the questionnaire contained both mandatory and optional questions that could be omitted. Those who answered they did not participate in hybrid teaching formats were not counted in the percentage overview in the descriptive statistics. The analysis of the answers showed that the respondents had a good understanding of the questionnaire, the answers generally reflected the questions asked and there were comprehensive and relevant descriptions in the qualitative answers.

The questionnaire was conducted in SurveyXact, and the qualitative answers were exported for in-depth text analysis. The quantitative data were analysed through SurveyXact and visualised using pie charts. Using a grounded approach, the qualitative data were subjected to a thematic analysis to identify themes concerning the pedagogical and technical perspective of using the hybrid teaching format, as well as themes concerning the teachers' and students' experiences of and opinions on the use of this format. This paper focuses on the experiences of students and teachers, as well as the differences between them. The following section delves into the results of the mixed-methods study, which offers empirical evidence to explore the tension between teachers' and students' preferences regarding hybrid teaching.

3. Analysis and Findings

The analysis showed that AAU used a variety of hybrid teaching formats, both in terms of the technology and the pedagogies applied. For example, some teachers on campus merely brought their own computers to a regular classroom and connected via Teams or Zoom to the students online while projecting the slides. Others used already existing video conferencing classrooms, which allowed for better visual and audio representation, both on campus and for students online. Not enough video conference rooms existed at AAU, which led some departments to invest in several mobile video conference solutions, with better sound and moving webcams, providing more pedagogical choices. There was also a variety in the organisation, with some teachers and students offering or receiving formal instructions on how to participate in the hybrid teaching format in their education. Others (many) used more ad hoc and individual approaches.

Despite these variations in hybrid teaching formats, the following general picture of the students' and teachers' responses is interesting. When asked "how they prefer to teach", 77% of teachers answered that they preferred teaching face-to-face on campus (Figure 1). Only 11% preferred teaching using a hybrid teaching format. Several respondents elaborated that they preferred teaching either online or face-to-face but that the questionnaire did not allow for that answer. When asked "If the hybrid teaching format is offered in the future, would you use it?", 81% of the students answered "yes" (Figure 1), with preferences spanning participating on campus (38%), online (9%), and having the option to choose between locations (34%). Only 19% said "no" to this possibility.
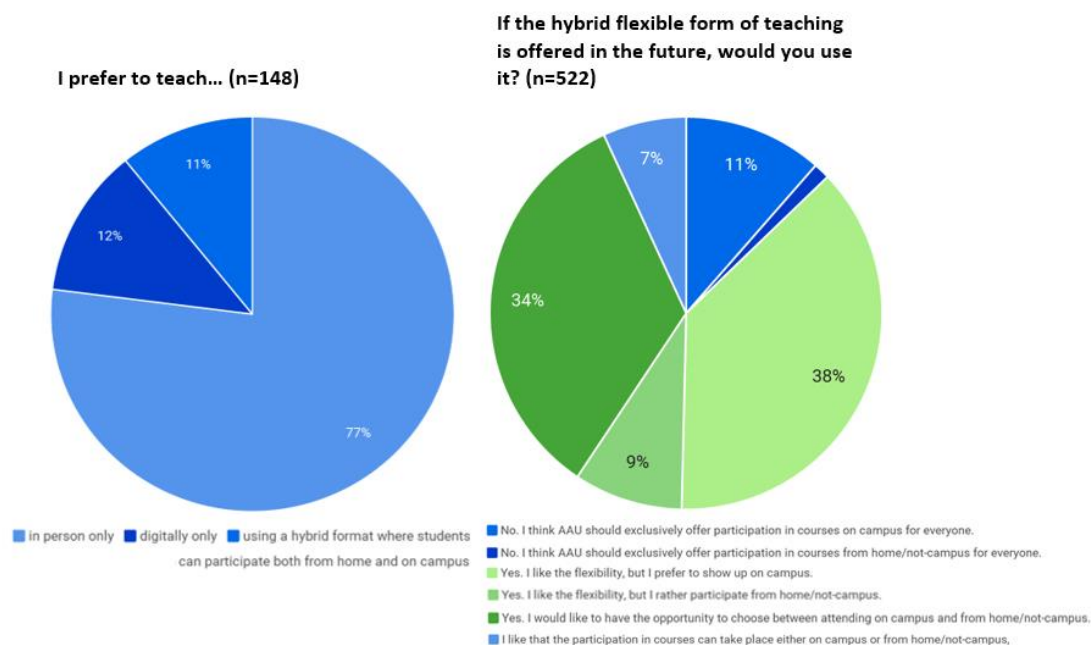

Figure 1. Overview of teachers' and students' preferences

Figure 1 shows a significant difference in how the teachers and students perceived the hybrid teaching format.

The qualitative responses to "how they experienced the hybrid teaching format" by teachers and students ranged from "*it worked fine*" to "*it was terrible*". It is worth noting that although the students and teachers agreed that the technical issues were a big problem, the students still largely preferred this format. The teachers experienced the format as quite challenging, and one teacher wrote, "*It was horrible just to be in the middle of it. I felt really incompetent ...*". The teachers' frustrations and challenges can also be seen in the student responses, as one student commented that the "*teachers honestly seemed annoyed by the extra work and they were generally working against the change*". Another student commented that "the *teachers' frustrations over the new hybrid teaching were expressed in several cases by scolding and complaining about the students*".

Even when the technical aspects worked, some teachers still found, "*The technology actually worked. It's just still an insurmountable educational obstacle*". Another teacher commented, "*I would rather not teach using the hybrid format until the technological setup is 'plug-n-play'... It is difficult enough as it is, and when you can't be sure from class to class that the technology is cooperative, it is a great source of stress and poor teaching*". This points to the technical setup greatly influencing how the teachers experienced the format and how it affected their teaching. However, as a student wrote, "*The teachers just had to get used to getting everything technical up and running, such as video and audio, but otherwise it worked just fine*". This means that it is also a matter of gaining experience using both technology and teaching in the hybrid teaching format.

When asked "which impact the hybrid teaching format had", 77% of teachers answered that it had a negative impact on their teaching (Figure 2).
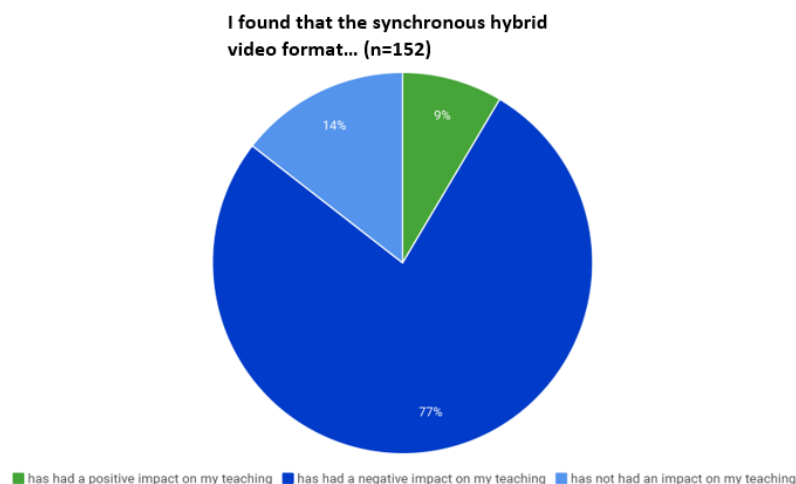

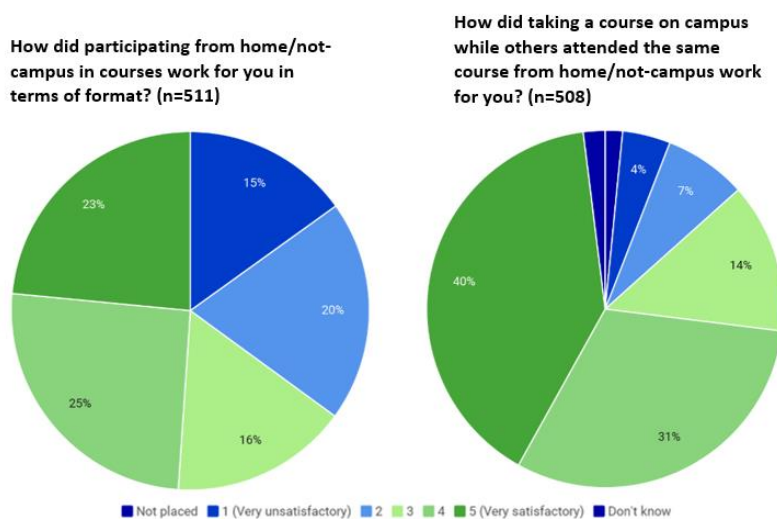Figure 2. Overview of the experienced impact of hybrid formats on teaching

Figure 3. Overview of students' experiences participating online and on campus

By contrast, the students were overall positive about how they experienced participating in a hybrid teaching format (Figure 3), both when participating online (25% and 23%) and when participating on campus (31% and 40%). From these data, it is however also obvious, that participating online was more dissatisfactory (20% and 15%) than participating on campus (7% and 4%).

As the teachers' and students' preferences are significantly different, it is relevant to investigate if this preference is similar at the various educational levels and faculties. Figure 4 shows the five educations with the highest number of respondents in the study, and their view on future use of hybrid teaching formats. Students attending BA psychology and MSc Business Economics & Auditing are the most positive though the qualitative answers show varying experiences. This confirms that students in general have a positive preference (i.e. it is not a single education with many respondents that creates this gap in preferences).

If the hybrid flexible form of teaching is offered in the future, would you use it?
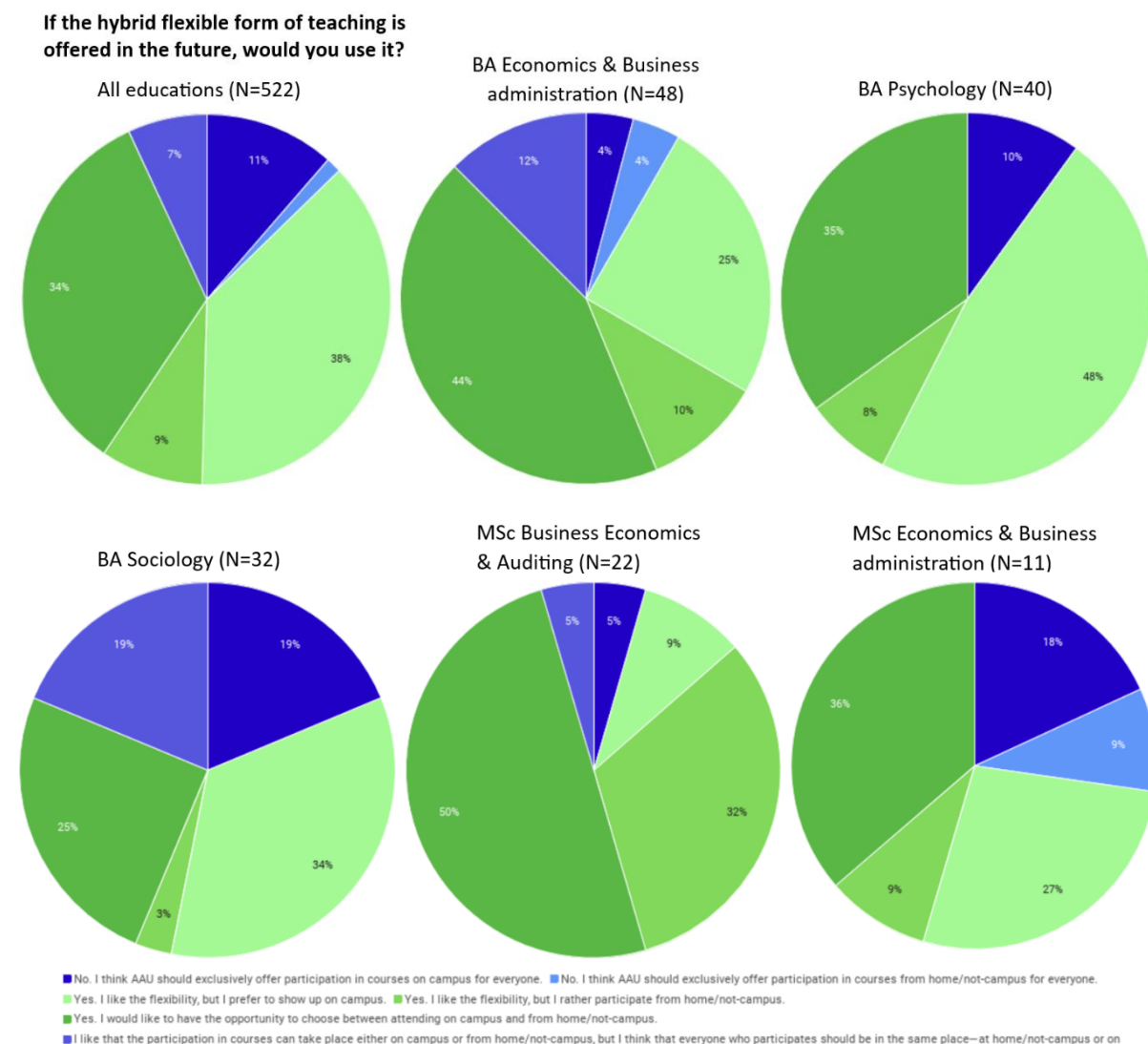
Figure 4. Overview of students' preferences regarding future use of hybrid formats across five educations

The qualitative responses showed that students participating online tended to feel excluded by their teachers. One student wrote, "*I have had the experience that you are included in classes when you have the opportunity to show up physically, and to a greater extent excluded in the home teaching situations*". Another way this issue presents itself is in how students were able to participate in class. As one student wrote, "*I think inequality has been an issue. It was difficult for them at home to get in touch with the lecturer with questions without just breaking in. At the same time, it was uncomfortable to be there physically when the speakers suddenly "shouted" questions at us*". This issue can probably account for some of the 35% of students (20% and 15%), who expressed that participating in classes online was unsatisfactory (Figure 3). Although qualitative student responses showed a tendency to feel

excluded, there was variation in this area, as some teachers handled the challenge of the hybrid format well. One student wrote, "*It has worked excellently. The teacher has been able to take into account both the students who participated from home and those who were physically on campus*".

In the questionnaire, the teachers were asked whether they had adjusted their teaching using the hybrid teaching format (figure 5).
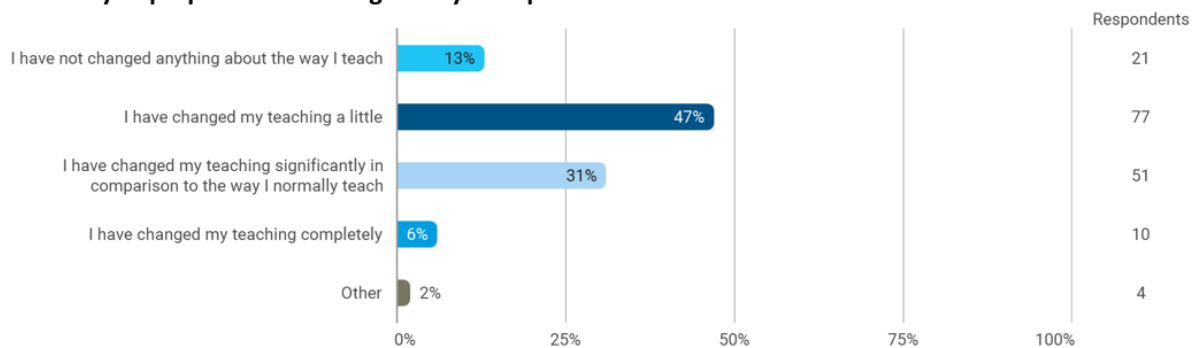

Figure 5. Overview of how teachers prepared for hybrid teaching (if "other" was chosen, a text field was provided)

Overall, 60% of the teachers (13% and 47%) had adjusted their teaching slightly or not at all when teaching using a hybrid teaching format (Figure 5). This could be a contributing factor to the 35% of students (20% and 15%) who were dissatisfied with participating online (Figure 3).

The teachers were also asked how they changed or adapted their teaching practice to the hybrid teaching format (Figure 6), with the option of choosing several categories. The results show that changes span from how the students were activated and how the class was structured to the teachers' actions towards the students and their own teaching practice.
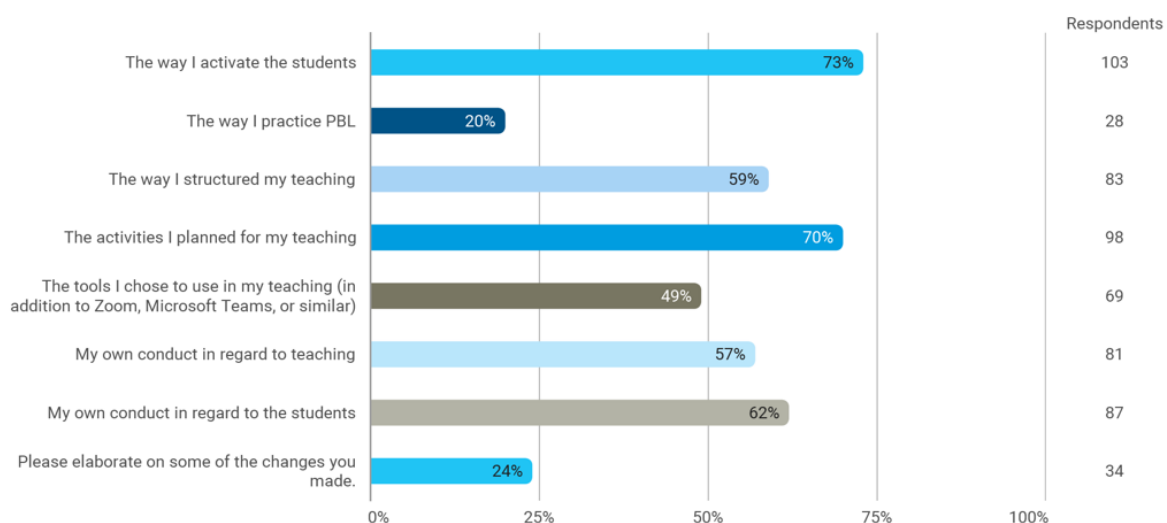

Figure 6. Overview of what teachers changed regarding hybrid teaching

When asked what type of teaching the teachers practised using the hybrid teaching format, most pointed to classic lectures (98%), followed by exercises and plenum dialogue (Figure 7).

What kind of teaching have you done on campus using a hybrid format (feel free to choose more than one option)?
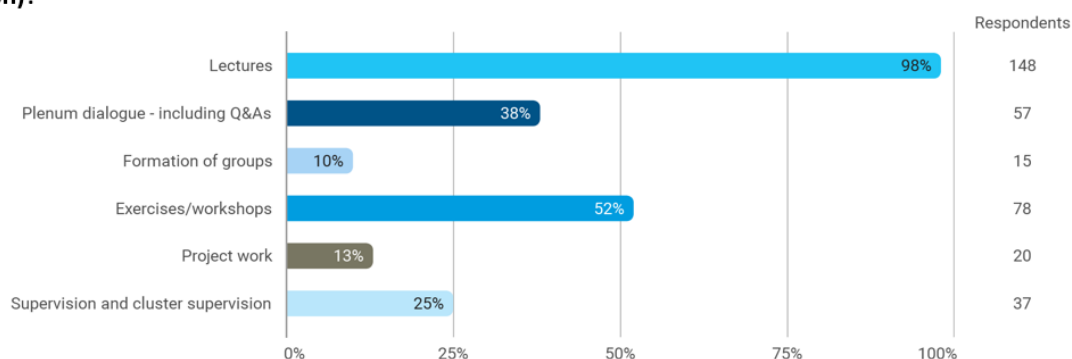

Figure 7. Overview of what kind of teaching was conducted

If little or nothing was changed in the teachers' teaching practice, and the teaching format was originally aimed at face-to-face situations, it might imply that the students participating online had not been considered, which emphasises the experience of being excluded. A student wrote, "*In short: awful. One thing is that you give the opportunity. But that the teacher so completely forgets / ignores those who are present online was simply not OK*".

The literature section pointed to the importance of the organisation supporting the teachers pedagogical and technological competences. The analysis showed that some teachers received pedagogical instructions, but they were geared towards full online participation. On switching to the hybrid teaching format, one teacher commented, "*I was trained in face-to-face teaching and have become good at it over the years. This does not mean I cannot develop further and become a very good teacher in hybrid teaching*". Another teacher wrote, "*If I am to deliver good hybrid education, it would require resources and possibly competence development on the teacher side*".
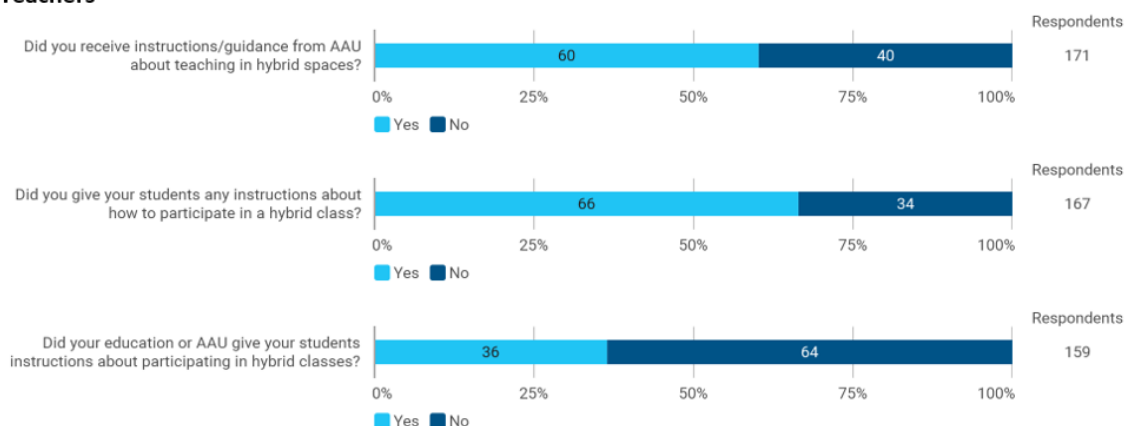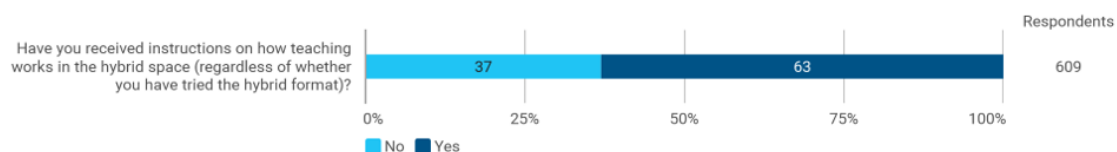
Instructions

Figure 8. Overview of the instructions given on hybrid teaching

Figure 8 shows that 60% of the teachers received instructions, but in their qualitative answers, they also expressed that they had very little time to adjust to these, and that the instructions were primarily technical "how to" and not pedagogical considerations. From a learning perspective, it is equally vital to consider how students can adjust to the new format. In total, 66% of the teachers answered that they provided information to the students, partly

because they found that the central AAU or the study programme did not fulfil this obligation. Both teachers and students agreed that only one third of the students received these instructions during the period of hybrid teaching. Similarly, the 37% that received instruction indicated that the instructions were primarily related to technology and logistics (i.e. which part of the class should stay at home or come to campus at a given session).

Consequently, there could be a relationship between the perceived negative impact teachers experienced that the hybrid format had on their teaching (77%; Figure 2) in this period and the lack of instruction, particularly the complete lack of pedagogical considerations for both teachers and students. Underlining this point, one teacher wrote, "*Learning is more than just a teacher presenting material. It is being present, conversations with fellow students, dialogue between teacher and students, the sudden emergence of common realisations and much more. If we are forced into a hybrid form of teaching, everything must be rethought*".

However, the responses to the questionnaire also included some positive voices, as teachers described the format as having great potential. For example, one teacher wrote:

> *"I think the hybrid format offers something important and can therefore only recommend continued use. On one hand, it gives the student flexibility that can be important if they either have a fragile health that during periods of flu (or other viruses) makes them vulnerable, lives far away, and therefore spends a lot of resources (time, money, energy) on commuting, or have some social challenges that can be relieved by being able to participate in full or in part online. On the other hand, it gives us teachers some opportunities to reach out to more people: for example, it could be students who would like to 'repeat' a lecture (if for some reason they have been prevented from attending the previous year—or just want it refreshed. Which is my experience this spring). Also, there may be students from other programmes who want to 'listen' (all lectures are basically public, so ...)".*

Comments from the student questionnaire were generally positive towards the hybrid format, although they provided many inputs for further improvements (i.e. better instructions, more aligned technologies, improved inclusion of online students, clearer distribution of roles, and more activating teaching). They were, however, in support of this format, as one student wrote, "*I think it is the most optimal and future-proof opportunity for teaching that best meets all needs for learning. You have the opportunity to continue to show up, if this opportunity is best for you, but also to stay at home if this is best*". Comments that emphasised increased accessibility to education and flexibility in participating in classes featured heavily in the students' qualitative responses. As one student wrote, "*It was a gift sent from heaven. It increases accessibility for everyone, and it also means that not all students have to live close to campus*". The students' qualitative answers pointed to various reasons for wanting the flexibility offered by the hybrid format, such as distance to campus, less stress (both when participating online and being in class on campus), providing the opportunity to be geographically close to and work with partners from practice and still attend classes (internships, business collaborations, and PBL projects), family situations, and student jobs. One student pointed out that the format created more equal access to education: *"I think it's a brilliant idea that I'm very much in favour of continuing. The fact that it is possible to participate from home gives people with challenges the opportunity to complete an education on an equal footing with others, which would otherwise not have been possible for them before".*

Have you participated in more courses because it has been possible to participate from home/not-campus?
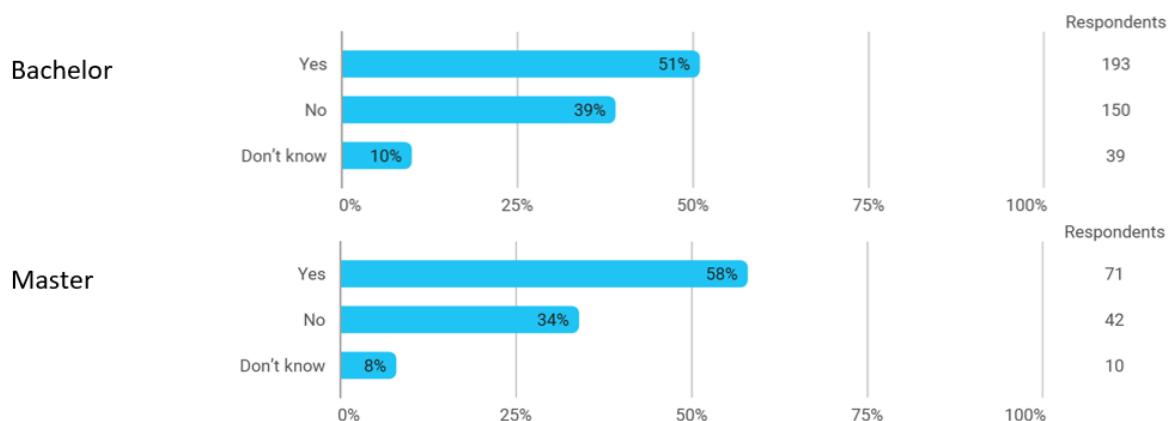
Figure 9. Overview of student participation in classes

The hybrid teaching format also allowed for different modes of participation, which changed how some students participated in class. As one student wrote, "*... some students who have not been active before on campus were super active from home*". More than 50% of the students, both in the bachelor's (51%) and master's (58%) programmes (Figure 9), indicated that they had participated in more classes because it was an option to participate from home. This could indicate that the hybrid teaching format can lead to greater participation and potential for learning.

In the teachers' qualitative answers, they also indicated that many students stayed at home when they did not have to. The teachers sometimes expressed their concern about this and articulated this as being the "easy solution" (this wording is used several times in the answers), as one teacher commented, "*I don't know what to do so that the students don't choose the easy solution*". This points to both the difficulty teachers had gauging student participation, activity, and learning when some students participated from home. It also highlights that some teachers considered showing up for a class on campus indicative of participation, activity, and learning, and that participating from home with a turned-off camera was indicative of non-participation, inactivity, and not learning. However, being online or on campus is not an indicative measure of participation and learning. The teachers' assumptions can also add to why 77% of teachers experienced that it had had a negative impact on their teaching (Figure 2) and that 77% of teachers preferred teaching face-to-face on campus (Figure 1).

The following section will discuss the findings from this study in relation to the key definitions and findings from studies found in the literature on hybrid teaching formats (section 1.1 Literature on hybrid teaching formats) and how these findings address the research question.

4. Discussion

The entire investigation yielded a lot of data that provides us with insights into the challenges and potentials that both students and teachers have experiences during the fall of 2020 regarding the hybrid teaching format. Based on this information and other studies, such as Jelsbak et al. (2018), much can be done to improve the physical setup of the hybrid teaching space/format (i.e. technological improvements as well as interior design of the classrooms) and develop and improve the pedagogical setup in hybrid teaching formats (e.g. Future Learning Spaces, 2023). However, the essential finding in this article is the discrepancy that exists between students and teachers in the very basic choice—to do or not do hybrid teaching formats.

Investigations from fall 2020 define teaching in this period as "emergency teaching", as teachers found they had to adjust rapidly to the lockdowns and partial reopening of the general society. Therefore, teachers at AAU had to adapt very quickly to changing situations, which could be why so few teachers adjusted their teaching using the hybrid format. There was no time for a good transition of teaching practice into hybrid formats, and no or few instructional courses were offered on teaching in a hybrid format. It can be argued that teachers did not adjust their teaching to hybrid formats because they did not have the didactical and pedagogical skills to make such a transition. Raes et al. (2019) described the pedagogical challenges in creating a learning design that is considered meaningful for the teacher, creates a sense of co-presence, and provides useful learning experiences. At AAU, the data show that both students and teachers agreed that it was difficult for teachers to activate students participating online and often resorted to lecture formats without engaging students actively, consistent with the findings of Raes et al. (2019, primarily with reference to Weitze 2015). This points to the difficulty of applying existing didactics and pedagogies from a face-to-face teaching format to a hybrid teaching format. As the empirical data showed, hybrid didactics and pedagogies are skills that need to be learned. Teacher training at the university level seldom includes hybrid didactics and pedagogies, which leaves teachers having to use skills from teaching face-to-face in a hybrid format, where students are present in the learning space in a very different way. Lacking hybrid didactics and pedagogies could also account for 77% of teachers experiencing that the hybrid format had a negative impact on their teaching (Figure 2).

Students in this investigation at AAU also aligned with the findings of Beatty (2012) and Blankson et al. (2014) (cited by Wright, 2016), as they wanted the flexibility offered by the hybrid teaching format. Despite technological difficulties, feelings of being excluded when participating online, teacher reluctance, and the inability to activate online participants, students at AAU still indicated that the hybrid format worked well for them. Both bachelor's and master's students even reported participating in more classes because of the flexibility offered by the hybrid format. Notably, 81% of students in this investigation (Figure 1) would make use of the hybrid teaching format if it were offered in the future. The analysis revealed that the choice of flexibility was not a sign of students preferring to stay at home or opting out of the physical campus classroom but rather a desire to have the flexibility to choose. Only 9% of the students (Figure 1) preferred to participate exclusively online. Other studies support the findings from this survey. One study at AAU (fall 2021), and another, which included experiences from three Dutch

universities (fall 2022), shows that although both teachers and students had enough of hybrid teaching formats during the pandemic, students still want the option (Ørngreen & Knudsen, 2022; Jensen et al., 2023).

In addition to changes to the roles of students and teachers, applying a hybrid teaching format also requires changes in how the university, as an organisation, supports students' well-being and monitors dropouts. Universities tend to be geared towards detecting well-being and risk of dropout based on students being physically present on campus where support systems are in place and where teachers and fellow students can keep an eye out for each other. Switching to a hybrid format would necessitate a reorientation to accommodate both the students who are on campus and those who participate from home.

4.1 Implications

The result of the analysis indicates large differences in preferences between the students' and teachers' regarding the use of hybrid teaching formats. This pertains to both differences in attitude and needs, as well as variations in aspirations for future teaching practices. This section will address possible implications of this study exploring the research question - *What implications could these results have for the future organisation of teaching in higher education?*

The AAU study shows that teachers lack tools and approaches for gaging the activity and participation of students participating online, as well as on how to accommodate having students participating in different modes. Universities may have pedagogical programs for junior and new staff, but continued development can be difficult for the individual teacher to prioritize, while busy at work and often with research careers that needs attention. A strategic approach may be needed, for example as in Finland, where a small competence development intervention focused on both hybrid teaching formats and students' motivation (Kokko et al. 2024).

Raes et al. (2019, referencing Lakhal et al., 2017; Wang et al., 2017; Wiles & Ball, 2013; Lightner & Lightner-Laws, 2016) highlighted the potential for the hybrid teaching format to be a better match and a reflection of modern society and a "multi-faceted student population". As the data from the present study show, there is a discrepancy between students and teachers in whether to do hybrid teaching formats. However, if hybrid teaching formats are the future of university education, according to the wishes of the students, this points to a need for further development of hybrid pedagogies and didactics and their relation to the subjects being taught. Even if it is a matter of convenience for the students, that does not make it any less relevant to discuss. It points to a need for universities to engage in the qualification and dialogue on which types of pedagogies they offer, and work towards a culture of acknowledging the hybrid teaching format as an equal and legitimate choice.

Denmark is a society that strives towards and is successful in having a well-educated population (Eurostat, 2022), although issues still exist because of, for example, distance to the university, family or work situations, student well-being, or psychological or social challenges with the existing format. Nevertheless, Denmark is a frontrunner regarding digital implementation (DESI, 2022), which offers opportunities to use digital approaches to address these issues. The data from the presented investigation show a high degree of interest in hybrid teaching formats from the students' perspectives but also some scepticism from the teachers. Beatty (2019A) and Raes et al. (2019) also pointed to reusability and accessibility, which give the organisation a level of flexibility when utilising the hybrid teaching format. Therefore, the situation calls for a re-examination of how we practice teaching at the university level and raises the question of the types of teaching offered at the university level.

On a societal level, we must discuss and consider the benefits that hybrid teaching formats can offer in addressing some of these challenges. Although the choice of whether to use hybrid teaching formats for some can be discussed locally regarding a specific module or education, it is also an organisational choice that institutes, faculties, and universities must discuss and work with "patiently within the same parameters" (Beatty, 2019B) for the benefit of students, teachers, and the organisation.

The strength and limitation of this study is that it focuses on the experiences of students and teachers, as well as the differences between them and doesn't delve into the details and differences on an education and faculty level. Instead, the study raises the overall question regarding hybrid teaching formats that we, as a society that educates, and the individual universities must address. A similar dialogue is also taking place regarding the workforce and how to lead in a hybrid work setting, a dialogue that mirrors the issues that education leaders and coordinators must deal with. This study does not say what is right regarding hybrid teaching formats, but that there is a huge gap between how students and teachers regard hybrid teaching formats, that must be addressed. This study provides valuable insights into hybrid teaching preferences at AAU, but further research across diverse institutions and student populations is needed to validate the findings and assess their broader applicability.

5. Conclusion

The research presented in this paper investigates how students' and teachers' perceptions of hybrid teaching formats differ, and what the key factors influencing these perceptions are. The study takes point of departure in a single case, but which includes a whole university and the various disciples that this university represent. Regarding the first research question - *How do students' and teachers' perceptions of hybrid teaching formats differ at AAU during the fall semester of 2020, and what are the key factors influencing these perceptions?* this empirical research study has shown that there are discrepancies between the students' and teachers' preferences regarding the use of hybrid teaching formats. Not only do students prefer to have the flexibility to decide if they want to be on campus, but they also find that they can participate and learn from both on-campus and online teaching situations. However, teachers assume that students do not learn as much when participating online, and some find choosing online participation to be an easy solution. For teachers, the hybrid format is an unfamiliar teaching situation, one for which they have not been sufficiently trained. It is remarkable that despite the technical issues, most participating students asked for flexible solutions, whereas most teachers preferred teaching face-to-face.

Regarding the second research question - *What implications could these results have for the future organisation of teaching in higher education?* the study shows a need for a general discussion of approaches to education and teaching that universities and the general society would like to support in the future, even though the research study was carried out at a Danish PBL university. The situation calls for not only further research into the hybrid teaching formats, on suitable hybrid pedagogies and didactics, and on how to implement them at the university level but also for a discussion at the level of the society on how we want to conduct teaching in higher education.

Acknowledgments

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