Covid-19 and (re)learning teaching: Never let a crisis go to waste

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For universities around the world, the Covid-19 pandemic necessitated a rapid transition to online (remote, distance) education as authorities implemented measures to reduce infection rates. In Sweden, universities witnessed roughly 18 months of continuous online education, followed by a period of mixed and campus-based learning environments in the autumn of 2021, and a return to online education in early 2022 as infection rates increased. The Swedish government's removal of restrictions and plans to remove Covid-19's classification as a disease dangerous to society (*samhällsfarlig sjukdom*), however, suggest that universities will no longer be required to offer online instruction. In response to this shift, and in the spirit of Winston Churchill's call to "never let a good crisis go to waste," we investigate some changes in teaching and learning caused by the Covid transition. Findings in international studies about university adaptations to Covid and quantitative and qualitative data from our home institution indicate that distance education catalysed new technological engagements for students and teachers, while also reinforcing pedagogical and didactical developments discussed in the literature on teaching and learning in higher education. In other words, the Covid crisis encouraged instructors to (re)learn to teach – not merely by adopting new technologies, but also by implementing student-centred learning. To illustrate this claim, we examine key changes made by teachers in our department, which include pre-recorded mini-lectures, student-response technologies, and other practices loosely classifiable as interactive learning. These adaptations could facilitate teaching and learning on campus, should teachers choose to continue using them.

Keywords: student-centred learning, online/remote/distance education, Covid-19, digitalization

INTRODUCTION

At the University of Gothenburg and many Swedish universities, the spring of 2020 sparked what is widely called the "Covid transition" in higher education. Staff were informed that "all teaching" was "transferred to distance education" on March 18, 2020, with digital learning environments to be "fully implemented" within seven working days (University of Gothenburg, 2020a). This rapid shift from in-person, campus-based teaching to remote, online environments was a crisis response to the dramatic spread of the SARS-CoV-2 virus (henceforth: Covid-19). Between March 2020 and February 2022, teachers at the University of Gothenburg conducted roughly 18 months of continuous online education, followed by a period of hybrid learning environments in the autumn of 2021 as Covid-19 infection rates

dropped, and a return to online education in December 2021 as new virus variants spread. The Swedish government's removal of most pandemic-related restrictions on February 9, 2022 and plans to withdraw Covid-19's classification as a disease dangerous to society (*samhällsfarlig sjukdom*), suggest, however, that universities and teachers will no longer be forced to conduct online instruction (Ekot, 2022).

The University of Gothenburg and other Swedish universities were hardly unique in their crisis response to the pandemic. Similar rapid transitions to online education occurred around the world as various studies have indicated (e.g., Day et al., 2021; Hofer et al., 2021; Meccawy et al., 2021; Osman, 2020; Ronkowitz & Ronkowitz, 2021; Takayama, 2020). Educators with expertise in disciplines such as geography (Day et al., 2021), computer science (Hofer et al., 2021), instructional technology (Ronkowitz & Ronkowitz, 2021), economics (Fjelkner et al., 2021), and education (Takayama, 2020) sought to document, analyse, and disseminate their findings about the Covid transition's impact on their institutions.

The present article aims to contribute to this literature in two important respects. First, in contrast to previous research on the Swedish university context during the pandemic, which has looked at the ramifications of online education for students' wellbeing (Fjelkner et al., 2021), we ask how the Covid transition affected "classroom" teaching and learning at a large state-run Swedish university. Second, we ask how Covid transition adaptations relate to pedagogical developments advocated for in the broader literature on teaching and learning in higher education, with the aim of identifying practices that might productively inform post-pandemic teaching on campus. While returning to campus-based instruction could entail returning to the *status quo ante*, we, in the spirit of Winston Churchill's famous (and perhaps apocryphal) remark, see such a move as "wasting a good crisis." Our evidence suggests that the Covid transition not only facilitated new digital engagements for students and educators, but that it also moved teachers toward pedagogies reflecting research about effective educational practice. To illustrate this point, we discuss some of the key changes made by teachers during the pandemic, which include pre-recorded mini-lectures, student response technologies, and a set of practices loosely classifiable as student-centred and interactive learning.

We structure our analysis as follows. In a first section, we review the relevant international literature on Covid-19 adaptations in higher education and highlight key connections to pedagogical research. Then, after introducing our research data and methods, we describe higher education practices at our department prior to the Covid transition. Subsequently, we introduce survey data collected by the Faculty of Social Science about teachers' and students' experiences of distance education. Against this backdrop we then present autoethnographic data on pedagogical adaptations elicited by distance education at our department. After discussing the significance of these developments, we conclude by highlighting (re)learning to take with us back to campus and suggest directions for further research.

COVID AND HIGHER EDUCATION

International research published during the first 18 months of the pandemic indicates that most universities had limited experience with distance education prior to the global transition to online learning. In Canada, Germany, Japan, Hong Kong, Oman, Saudi Arabia, and the US, as in Sweden, higher education was overwhelmingly campus-based, and relatively few teachers were experienced in teaching in digital environments (Day et al., 2021; Hofer et al., 2021; Meccawy et al., 2021; Osman, 2020; Ronkowitz & Ronkowitz, 2021; Takayama, 2020). Before

the pandemic began, digital slide shows were the main form of digitalization widely adopted across the academy (Hofer et al., 2021). Yet, while few universities were prepared for distance education (Ronkowitz & Ronkowitz, 2021), most adapted rapidly and experienced surprisingly positive outcomes. International studies find that student attendance rates in online courses were high, enrolment levels remained largely constant, and student performance and completion rates were as good, and in some instances better, than those of campus-based instruction (Day et al., 2021; Meccawy et al., 2021; Osman, 2020; Takayama, 2020). The primary challenges reported were unequal access to technology and appropriate workspaces for students (Day et al., 2021; Ronkowitz & Ronkowitz, 2021), students who experienced lower levels of wellbeing due to fewer opportunities for socialising (Day et al., 2021; Fjelkner et al.; 2021), and stress among students and teachers alike (Day et al., 2021; Fjelkner et al.; 2021; Meccawy et al., 2021).

Studies of the Covid transition in higher education have produced some new findings. One potentially surprising result is that some students preferred asynchronous learning environments to synchronous ones (Day et al., 2021; Meccawy et al., 2021; Osman, 2020). Accordingly, some researchers projected that the pandemic learning experience would generate a higher demand for online courses (Day et al., 2021; Osman, 2020). In other respects, pandemic-induced online teaching merely confirmed previous findings from research on student learning in higher education. For example, we have long known that teachers need to attend to different learning styles and preferences (e.g., Dunn, 2000). Likewise, the Covid transition studies demonstrate yet again that student learning is not a "one size fits all" endeavour (Day et al., 2021; Hofer et al., 2021; Meccawy et al., 2021; Ronkowitz & Ronkowitz, 2021). Some students preferred online courses with lectures taking place digitally at roughly the same time and tempo as during a campus-based course (e.g., Ronkowitz & Ronkowitz, 2021). Others preferred pre-recorded lectures due to the flexible learning schedules they enabled (e.g., Day et al., 2021). Covid transition research also reports that students found it difficult to tolerate long lectures, whereas multiple mini-lectures were more appealing (Ronkowitz & Ronkowitz, 2021). This resonates with findings about challenges associated with traditional lectures such as short attention spans (cf. Benjamin, 2002; Davis, 1993; McKeachie, 1999) and the risk of focusing too much on "what the teacher does" as opposed to "what the student does" (cf. Biggs, 1999). Other results from Covid higher education studies include the need to develop new ways of stimulating student engagement (e.g., Day et al., 2021; Takayama, 2020), a positive correlation between frequent feedback and student learning and the need to scaffold learning and build in processes that help students learn to work together, such as creating contracts and rules for group work (Hofer et al., 2021). These findings for online education are equally applicable to campus-based instruction.

DATA AND METHODS

As is the case with many recent Covid transition studies, research for this investigation began *in media res*. A seminar focused on learning from the Covid crisis organised by the Faculty of Social Sciences on October 22, 2020, provided the initial inspiration. After writing a short blog post reflecting on Covid adaptations discussed at this seminar (Wackenhut & Gillette, 2020), we decided to conduct a more systematic investigation primarily drawing on two sources of data.

The first is quantitative: three surveys administered by the Faculty of Social Sciences during the first year of online instruction (University of Gothenburg, 2020b, 2020c, 2020d), two to

students, and the third to teachers. We use the aggregated survey results to identify patterns in digital teaching and learning in the wake of the Covid transition.

The second is autoethnography. During the first year of the pandemic, both authors were active teachers in multiple subjects at the undergraduate level and served as curriculum directors for undergraduate degree programs offered by our department. The task of managing the curriculum in these two subjects, which included teachers' meetings, and work with pedagogical quality, gave them in-depth knowledge of the strategies teachers adopted during the Covid transition. Additionally, when our department transitioned to online teaching, Wackenhut was quickly identified as one of the more "technology savvy" instructors. He was requested to provide (online) instruction in the new digital technologies that all teachers at the department were expected to use, an assignment which he carried out for two consecutive semesters (spring 2020, autumn 2020). Wackenhut was also part of the department's pedagogical task force, which organized seminars and workshops on remote pedagogy during the Covid transition. Gillette attended these seminars and was invited to present her distance education strategies at one of them. Both authors kept written notes from these activities.

In total, these activities amounted to nearly 100 hours of observational data, which included information about our own practices and knowledge gained about other instructors' adaptations. To analyse our material, we took an iterative and inductive approach (see Bernard, 2011 pp. 6–7; Mills et al., 2010). We used trends identified in the student and teacher surveys to classify our observational data. Subsequently, we chose to focus on trends that resonated with key findings from the international literature on Covid and higher education, to make our analysis relevant even beyond the Swedish university context.

Overall, it is our goal is to avoid *wasting a crisis*, which we understand as a collective rather than individual endeavor. To preserve teachers' personal integrity, we have chosen to focus on specific adaptations and their effects, which eliminates the need to identify individuals or particular curricular subjects. Furthermore, it is worth reiterating that the University of Gothenburg, like other Swedish universities, is a state institution and therefore bound by shared values defined by the government (Värdegrundsdelegationen, 2013). These values include the public's right to information about the university's activities, and researchers' and commercial actors' right to use this information. In general, "openness is a significant key word for state institutions' and their employees' activities" (*Öppenhet är ett betydelsefullt nyckelord för myndigheternas och deras anställdas verksamhet*) (Värdegrundsdelegationen, p. 15). Thus, the information on which this study is based can be considered to be in the public domain.

THE STUDY CONTEXT BEFORE AND AFTER THE ONLINE TRANSITION

In our department, undergraduate instruction prior to the pandemic was primarily based on lectures. Table 1 summarizes the allocation of instructional hours in nine undergraduate introductory courses in five subjects at the department during the autumn of 2019. The median number of contact hours per week in these courses was nine, of which 64% were lectures, 27% seminars and group work, and 9% introductions (e.g., to the course, assignments, etc.). As the table indicates, lectures made up roughly two-thirds of the teaching provided in some undergraduate courses, and very few instructors adopted a flipped classroom pedagogy (see Butt, 2014; Gilboy et al., 2015). Most instructors strongly felt that "teaching" meant lecturing. Indeed, the word "teaching" (*att undervisa*, *undervisning*) was often used as a synonym for lecturing (*att föreläsa*, *föreläsningar*), with other instructional activities, such as supervision or examination, excluded from this term.

Table 1. Allocation of instructional hours in nine introductory courses

Course id	Average hrs/week	% Lectures	% Seminars & group work	% Introductions, other
Subject A intro 1	11	46%	30%	24%
Subject A intro 2	10	58%	30%	22%
Subject A intro elective	8	70%	27%	1%
Subject B intro 1	9	76%	16%	8%
Subject C intro 1	10	47%	36%	17%
Subject C intro 2	7	67%	12%	21%
Subject D intro 1	10	27%	69%	4%
Subject D intro 2	8	64%	27%	9%
Subject E intro 2	8	74%	23%	3%
Median	*9*	*64%*	*27%*	*9%*

When the university mandated remote work, departments in the Faculty of Social Sciences largely retained their campus-based course planning, replacing the physical classroom with digital spaces in Zoom, Canvas, or, to a lesser extent, Teams. Few if any instructors sought to develop online environments resembling the increasingly popular massive open online courses (e.g., Zhu et al., 2018). Another weighty decision that teachers made – whether or not they were fully conscious of its importance – was choosing between synchronous or asynchronous pedagogies. Some instructors replaced in-classroom lectures with (synchronous) live online lectures, while others pre-recorded lectures and posted them on digital learning platforms, leaving it up to students to decide when they watched them (asynchronous). A third option that some teachers employed was to record their live online lectures and place them on digital learning platforms, allowing for both synchronous and asynchronous learning. While some instructors switched between synchronous and asynchronous modes during the period that our university was predominantly online, most continued with the choice they had made when the Covid transition began. However, as we describe below, over time instructors modified how they implemented these initial choices to increase student engagement.

TEACHER AND STUDENT EXPERIENCES OF ONLINE TEACHING

The Faculty of Social Sciences conducted two surveys with students (University of Gothenburg, 2020b, 2020c) and one with teaching staff (University of Gothenburg, 2020d) to gauge how the online transition affected respondents' wellbeing and learning and work environments. Teachers were surveyed during the first term of distance education. The survey was sent out to 503 teachers of which 203 (40%) responded. Students were surveyed during the first and second term. During the spring term, the survey was sent to 8,216 individuals of which 1,907 (23%) responded. During the autumn term, 1,770 out of 8,148 (22%) responded.

Teachers reported that the pandemic increased their workload (University of Gothenburg, 2020d). They experienced lectures, seminars, and practical exercises as functioning comparatively less well than "normal," in part since they perceived students to be more passive in online classrooms compared to pre-pandemic instruction. Zoom was by far the dominant digital tool that teachers employed. About 68% reported that they gave live lectures on Zoom, while

38% reported they pre-recorded their lectures (University of Gothenburg, 2020d). In addition to Zoom, teachers reported that they used more frequently other tools like Microsoft Teams, Mentimeter,[1] a digital quiz function in the university's e-learning platform (Canvas) and a digital conversation function in the same. While all of these tools had been available to staff even before the transition, they had been rarely used.

Students stated that they experienced worsening mental health as the pandemic and online teaching continued, although older students reported fewer problems than younger ones (University of Gothenburg, 2020b, 2020c). Maintaining motivation and focus during distance education was perceived as more difficult. No clear preference for synchronous or asynchronous lectures existed among the respondents. About half reported that lecturing online in real-time had worked well, while half stated that pre-recorded lectures had worked well (University of Gothenburg, 2020b, p. 10, 2020c, p. 14).

PEDAGOGICAL CHANGES DURING ONLINE TEACHING

As the pandemic dragged on, teachers increasingly voiced concern about weaker student participation and students' social isolation. In one-on-one and small group discussions, and during online pedagogical seminars, they discussed what could be done to stimulate student engagement in online instruction. Many reported modifying their pedagogical and didactical approach, particularly with regard to lecturing. By choice and of necessity, teachers moved away from the longer lectures that had typified instruction. Which modifications a teacher adopted looked different depending on whether the instructor had chosen synchronous or asynchronous lectures, although they had at least one feature in common, related to the chat function in Zoom.

Synchronous lectures: "Video killed the lecture star"

As noted above, previous research on student learning in higher education has long shown that lecturing is not necessarily the best mode of instruction for furthering students' learning. Online teaching through e-meeting tools amplified these challenges, both at the University of Gothenburg and as reported in international studies of the Covid-19 transition (e.g., Ronkowitz & Ronkowitz, 2021, p. 197). Students struggled to remain focused during a digital two-hour lecture (University of Gothenburg, 2020b, p. 11), and as the pandemic wore on, clarified that they needed frequent breaks. Some complained about classmates who kept their cameras off. For teachers, delivering lectures online was more difficult than in the physical classroom. Poorer ergonomics (see Gerding et al., 2021), the stress of continuously looking at one's own image on screen (Morris, 2020), and reduced possibilities for non-verbal cues that typically signal well-functioning communication (Wiederhold, 2020) all contributed to higher levels of fatigue. Teachers also reported that an inability to see on-screen all students at once when class sizes exceeded 15 or 20 people (depending on one's screen size), and students who kept their cameras off, made instruction more challenging (see also University of Gothenburg, 2020d, n.p.). Other issues that teachers mentioned included keeping track of comments written in the Zoom chat function – although, as we discuss below, the chat function also offered advantages for stimulating student participation.

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[1]   Mentimeter is a digital audience response system that is not too different from the now widely used "clickers."

Our data indicate that the live lecture had certain advantages. For example, while occurring on Zoom, they still resembled the pre-pandemic "normal" classroom to some degree, which some students appreciated. For teachers, synchronous lectures required the lowest time investment: as with an in-person lecture, the teacher needed time to prepare plus delivery. At the same time, live lectures had certain disadvantages. As noted above, Zoom made it more difficult for teachers to gather and interpret non-verbal cues from students (cf. Wiederhold, 2020). In a physical classroom, such cues help teachers determine whether they are going too fast or too slow, how engaged students are, and whether they need to elaborate on a particular point. In digital environments, teachers had far fewer cues about student engagement. While few teachers had voiced concerns about student passivity during on-campus lectures, student passivity in digital classrooms became a problem to manage.

As the pandemic wore on, instructors developed different strategies to recalibrate their synchronous online lectures. Some opted to add more breaks to their lectures, talking for no more than 10 to 15 minutes before inviting everyone to take a short break. Others adopted strategies for encouraging students to become active participants rather than a passive audience. For example, teachers solicited student comments or questions on what had been said thus far, or posed their own questions related to the content for students to answer. These Q & A and comment sessions took place orally and in written form using the chat function. Sometimes they developed into prolonged conversations and debates in the chat function, with students interacting directly with one another rather than waiting for the teacher to respond. Several teachers recounted that when a chat debate took place among students, they chose to let it take its own course rather than intervening or commenting on it. Crucially, teachers who had not employed such active learning techniques in the middle of a classroom lecture reported using them online. Finally, as discussed below, some teachers turned to (student) response tools, like Mentimeter, to facilitate communication and interaction.

Asynchronous lectures: Short and sweet, with a live moment afterwards
Like the live lecture, the pre-recorded lecture had both advantages and disadvantages. Flexibility was a key asset. Students could watch the content "on demand," when it was convenient for them. They could re-listen to or re-watch segments that they did not understand the first time around. If a student wished to pause a pre-recorded lecture, she could do so at any moment, and return to it later. For teachers, pre-recorded lectures also offered flexibility. An instructor could re-use a recorded lecture if a given course's content stayed consistent from one semester to another. Similarly, if she had recorded a lecture on a text for one course, and that text was also used in another course, it might be possible to use the pre-recorded lecture for both. Pre-recording lectures also offered teachers flexibility about when they taught, as compared to a "live" lecture. If it were more convenient to record the lecture at 19:00 than at 10:00, or three weeks before it was scheduled in the course, the teacher could do so. Additionally, unlike a live lecture scheduled for a two-hour block, a pre-recorded lecture had no particular length requirements. Many chose to record multiple mini-lectures rather than a single two-hour lecture, a finding also reported in the international literature (Ronkowitz & Ronkowitz, 2021). While pre-recorded lectures required a heavy short-term time investment (a disadvantage, see below), in the long run, they freed up the instructor's time, which could then be used for other learning activities.

Turning to the disadvantages, from the student perspective, pre-recorded lectures meant the student had to take responsibility for watching them. While some thrived with this flexibility,

others reported struggling with time management and preferred to meet online for a live lecture. From the teacher's perspective, pre-recorded lectures typically required a larger investment of time and energy than live lectures. One reason was most teachers did not simply record the lectures that they had developed for in-person teaching but revised and separated them into smaller mini-lectures, which required extra effort. In addition, pre-recorded lectures demanded a higher level of technological sophistication, as teachers needed to learn how to record an audio track on a PowerPoint or record a video lecture with digital slides on Zoom. Most teachers had not used these functions before and so learned them as they experimented with asynchronous pedagogies. To produce higher-quality recordings, investments in technical equipment, such as microphones, camera(s), or lights, were necessary. Finally, as the pandemic continued, several teachers felt that a pre-recorded lecture was not enough to stimulate student learning.

This sentiment, which several teachers related to worries about students' social isolation and passivity, led many teachers to add a complementary online activity to the pre-recorded lecture, such as live Q & A sessions, live short discussions in which the teacher asked the students to answer questions, and student-led discussions in breakout rooms or on discussion boards. These additions made the course more akin to a flipped classroom (see e.g., Butt, 2014; Gilboy et al., 2015), a development noted in international research on the Covid transition (Hofer et al., 2021). Interactive complementary activities encouraged students to engage more deeply with the lecture materials and/or readings to develop questions or carry out a discussion. In these synchronous online sessions, similar to the practices adopted during live lectures, students frequently used the chat function to communicate rather than speaking. Several teachers reported that this increased student participation. Whereas in an on-campus classroom such sessions were limited to students who "liked to talk," in digital classrooms the chat function enabled students who preferred to remain silent, but nevertheless wanted to join in the conversation, to do so via text.

Stimulating online interaction and participation
Facilitating students' active participation has already been a challenge for educators in campus settings (c.f. Fritschner, 2000; Karp & Yoels, 1976). During the pandemic, online education increased the number of teachers expressing concerns about student engagement, both at our department and in international contexts (e.g., Day et al., 2021; Hofer et al., 2021; Takayama, 2020). Whereas instruction in physical classrooms enabled close contact between instructors and students, digital learning increased the distance between instructor and student – offering more space for students to opt out of portions of instruction. The most common form of "opting out" was turning off digital cameras. Students who kept their cameras off were present (or appeared to be present), but their levels of engagement were impossible to assess. While teachers were able to adapt well-proven techniques for discussions in smaller groups such as the beehive (Fry et al., 2009, p. 64) to online instruction with the help of, for example, the Zoom breakout rooms function, not all students were willing to take part in such endeavours. Several teachers reported that a portion of students logged out of online instruction as soon as the words "breakout room" were uttered, returning when the announced activity had presumably ended. Students explained that they felt too "put on the spot" by what they experienced as unexpected small group discussions with "random" other students whom they did not know. Some also said that their remote work environment (typically at home, but sometimes a café or other location) was not suitable for participating in this way.

Teachers responded to these challenges in different ways. Some found student response tools like Zoom polls or Mentimeter invaluable for encouraging students to participate actively. These tools arguably lowered the threshold for students to engage, as the student simply had to select from a range of response options (e.g., in a multiple-choice poll) or produce three words for a Mentimeter word cloud. Further, polls and Mentimeter provided students anonymity while simultaneously indicating what a majority of other participants thought, which arguably reduced the feeling of being "put on the spot." Finally, whether students had their cameras or microphones on or off when responding through such tools made no difference to participating.

Another strategy that some teachers adopted to discourage students from opting out of breakout room discussions was to develop "permanent" breakout rooms. Rather than relying on Zoom to randomly assemble small groups, these teachers pre-organised small groups for students, typically in Canvas, informing students that these were their "permanent" discussion groups for half or the whole course. In the pedagogical literature on teaching and learning, this mode of collaborative learning, sometimes called "tribes" (versus "nomads"), has been shown to foster intimate learning in large classes by promoting a sense of community in the small groups (Griffith et al., 2015). Used online, breakout "tribes" allowed the students to get to know their fellow small group members fairly well, which solved the challenges of holding discussions with "random" unknown classmates. Some students reported that their active participation in "tribe" discussions was driven by a feeling of loyalty or responsibility to the other group members. In other words, creating online "tribes" also facilitated active learning, albeit via a different route than interactive digital tools.

DISCUSSION

Beghetto (2021, p. 1) recently noted that crises can "be deeply troubling and anxiety provoking, [but] they can also serve as an important catalyst for creative action and innovative outcomes at and beyond the individual level." The emergency switch to online teaching in the wake of the Covid-19 pandemic reflects this pattern. As reported in the surveys and witnessed during autoethnography, students and teachers found digital learning stressful and challenging. Students in particular felt that their mental health suffered from not being able to come to campus. Nevertheless, as our results and the patterns described in the international literature indicate, pedagogical adaptations made by many teachers during pandemic also brought online instruction closer to a number of pedagogical best practices described in literature on teaching and learning in higher education. Thus, while our return to campus could mean returning to the *status quo ante*, we argue against "wasting a good crisis." Teachers' and students' creative responses to the emergency online transition might productively inform instruction in physical classrooms.

Even though digital environments and tools were new for many instructors and students, many Covid transition difficulties were familiar, albeit exacerbated by remote education. Long before the onset of the pandemic, pedagogical research had emphasized the need for teachers to attend to different learning styles and preferences (e.g., Dunn, 2000), unevenly distributed in-class participation (e.g., Fritschner, 2000), and limited attention spans (e.g., Davis, 1993). Some researchers called for focusing on "what the student does" rather than "what the teacher does" (e.g., Biggs, 1999; see also Stefanelli, 2017). Our evidence, and the international Covid transition literature, indicate that crisis-induced distance education forced teachers to engage with these challenges in ways that otherwise might not have occurred on campus. Instructors recrafted lecture pedagogies, experimented with digital student response technologies, and used

multiple media to encourage student participation in an effort to counteract the greater distance imposed by remote instruction.

One focus of this investigation has been synchronous and asynchronous ways of adapting lectures to focus more on "what the student does." Neither the live-online nor the pre-recorded lecture was superior from the outset: each had strengths and weaknesses, and the evidence suggests that they spoke to different student needs. Noteworthy is how remote education made many teachers more concerned about student engagement and caused them to shift their lecturing styles to increase opportunities for students' active participation. Teachers who had rarely interrupted a lecture to attend to a student discussion related to its contents did so online. Some reported preparing questions for the students to discuss during "lectures." Likewise, teachers who adopted asynchronous teaching complemented recorded instruction with interactive moments online. These shifts toward "what the student does" are in line with recommendations outlined in (pre-pandemic) pedagogical research and could be continued in physical classrooms. Here, however, the physical makeup of the classroom could pose barriers. For example, lecture halls with fixed student seating physically oriented to the lecturer's podium might render interactive "in-the-middle" group discussions more difficult.

Interactions with teachers at our department suggest that many view "on-campus teaching" and "synchronous lectures" as synonyms. Still, the short return to campus during the autumn of 2021 revealed that at least some teachers re-used a pre-recorded mini-lecture and then offered a synchronous on campus interactive session to facilitate deeper learning. Such choices can contribute to a "levelling of the playing field" by giving students who find a particular subject matter difficult the opportunity to return to a pre-recorded lecture multiple times. In addition, using a pre-recorded mini-lecture to facilitate a "flipped" instructional design in campus-based instruction, such as an in-class problem-solving session or a group discussion, gives students opportunities to "do" as well as watch or listen, a practice that previous research has shown to be effective (e.g., Biggs, 1999).

Digital student response technologies are another aspect of pandemic pedagogy that instructors may wish to keep. Tools such as Mentimeter and online chat spaces facilitated student participation in remote education and could serve the same purpose in classrooms. These tools expand student engagement beyond the "vocal minority" who answer questions or make comments in lecture halls. By activating a broader cross-section of attendees to participate, their continued use in in-person classrooms would make learning more inclusive and accessible.

Moving forward, the Covid transition can be an impetus for developing combinations of digital and in-person elements that have the potential to enhance student learning while increasing equity in the classroom. Carefully crafted learning environments that blend in-person and digital components could maximize modalities for student engagement and teacher-student flexibility while avoiding the "digital divide" (Ronkowitz & Ronkowitz, 2021) that made Covid-19 hit some students harder than others. Even without going all the way towards a HyFlex approach (e.g., Leijon & Lundgren, 2019), teachers who include some "mixed media" elements in campus-based teaching could increase spaces for student expression. In particular, the creation of a dedicated chat channel might facilitate participation by students who are reluctant to speak aloud during in-class discussions.

CONCLUSION

This study investigated some central ways in which teachers at our home institution changed their pedagogical and didactical approaches during the Covid transition. Teaching and

learning can look differently across departments, faculties, and universities, which may limit the generalizability of some aspects of our discussion; for example, Gillette can attest that undergraduate teaching at American small liberal arts colleges does not have the preponderance of lectures found in instruction here. Still, some of the adaptations described throughout this article, like the increased use of student response tools, could also productively inform education at those institutions. Although pedagogical research has long argued that no single teaching style or tool addresses all types of students and that there is no *eierlegende Wollmilchsau* able to solve all our pedagogical problems (e.g., Dunn, 2000; Griffith et al., 2015), the Covid crisis appears to have brought that message home, at least with regard to distance education. This leads us to argue that adaptations that we made to invigorate online learning spaces might also help to address pedagogical issues that exist in campus classrooms.

Pandemic learning was not only about digitalization, but also about (re)learning student-centred and interactive education. A goal of this study is to encourage instructors to consider which new elements, techniques or tools from pandemic teaching aided students in their learning processes and could be adapted to campus teaching. For example, two-hour lectures on campus might be profitably divided up and shortened to offer students breaks or facilitate question and answer sessions, including questions generated by the teacher as well as those from the students. New technologies for soliciting students' "voices" (orally or in writing) and stimulating their engagement with one another as well as with the teacher can generate broader participation and memorable learning experiences on campus as well as online. Organizing "tribes," "permanent" small groups who discuss issues regularly throughout the term, could create strong commitments to collective learning and safe spaces that facilitate deeper engagement in physical classrooms as well as on Zoom.

Several findings from our study, when linked to the trends identified in the recent literature on higher education's emergency response to Covid-19, raise questions that merit further research. The Covid transition increased teachers' concerns about student passivity, and our data reveals that many teachers modified their pedagogical and didactical approach – albeit to varying degrees – to stimulate student engagement. In many cases the resulting instruction was more student-centred in its design than the pre-pandemic one. Further research on this willingness to re-think and revise long-used practices is relevant to determining whether and to what degree educators will continue to use Covid crisis adaptations in the post-pandemic (teaching) world. Here, one line of inquiry might ask: what role did (pandemic-induced) uncertainty, which Beghetto (2021) would consider a potential catalyst for creative action, play in promoting change, vis-à-vis collegial discussions about pedagogical and technical challenges that intensified markedly during the pandemic? Another research topic would systematically map pandemic-induced changes to teaching and learning in Swedish higher education institutions and how these changes affected students' learning and educational achievement. The planning of future instruction, whether on campus, online, or a mixture of the two, would be usefully informed by such research, not least since some undergraduate students completed more than half of their university education in a digital environment.

Finally, we have argued that teachers should not waste a crisis. Whether or not they make use of the pedagogical adaptations described here after the eventual return to campus instruction is a subject worthy of study. How many will draw on Covid (re)learning to inform their pedagogy, and for those who do put lessons from the Covid transition into practice, which practices do they adopt and why? Only with this research, perhaps a year or more after

the Covid transition has concluded, will we know whether Covid (re)learning had a lasting impact on our pedagogy.

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