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Article

A Covid paradox: Collateral benefits enhancing future education

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Abstract

This paper aims to anecdotally research how - now post-Covid - instructors may continue to blend effective new online teaching methods with traditional approaches and thus improve future education. It is intended to be a pilot for similar case studies worldwide. Covid-19 has triggered a shift from in-class learning to online learning environments. This has created not only challenges for many unprepared educators worldwide but also opportunities. With the lift of restrictions, the future modes of higher education remain open to discussion. For this purpose, the paper contributes to this ongoing discussion by drawing from the experiences and insights of the instructors and the students from three institutions in Cambodia, Italy, and the USA during 2020 -2022. Building on the observations of these people and on insights from the recent literature, the authors conclude that innovative online and hybrid pedagogies can raise higher education teaching and learning to the next level. Continued use of innovative pedagogies post-Covid can significantly benefit student engagement and motivation, although this comes at a higher cost of more teacher preparation and increased commitment to technology. While the continued use of online tools can result in better learning outcomes for current students all over the world, schools can now make additional educational offers to previously underserved segments of the population. Both will provide net social benefits to students, educators, schools, and ultimately society worldwide.

Keywords: Covid paradox, student learning, teaching modality, remote teaching, hybrid lessons, case studies, global research collaboration, blended learning, participants-centered learning, educator-focused teaching, Italy, Cambodia, Silicon Valley, synchronous online teaching, flipped classes

1. Introduction: 2020 crisis actions and review of literature

In the forced and rapid move to online-only teaching and learning, schools fell back on pre-existing, but rarely used online tools, resulting in an individual mix of the online modes (Michigan State University, 2021). Educators began to create innovative, sometimes disruptive pedagogies for synchronous online teaching in response to the Covid pandemic and the broader trend towards working from home.

As the Covid pandemic spread, so began research on the transition from in-person classes to the unfamiliar teaching environment with synchronous e-learning (Jacques et al., 2021). Raes et al., (2020, p. 282) describe this as a "radical shift in the teachers' pedagogical methods in order to accommodate the new technology". Scholars were able to benefit from pre-Covid papers (Linder, 2017a; Zydney et al., 2019) describing the already available

tools for online learning as well as blended teaching, which were rarely used before the pandemic. Graham (2013) set out the hastily tested educational 'lifesavers', including class recordings, online videos, breakout discussion rooms, collaboration documents, and surveys. Games were used to encourage curiosity, motivation, and eventually, the learning of students previously accustomed to in-person classes. Methodologies to blend the various learning methods were hastily developed (Linder, 2016; Subramani & Iyappan, 2018).

The aims of this research were to identify which changes to teaching methods, introduced as a consequence of the Covid-19 pandemic, resulted in better teaching and learning and which of these improved teaching methods should be adopted long-term post-pandemic. This research also identifies improvements in teaching styles that were found to be applicable across regions, and others that seemed to be specific to one or more localities. The perceived improvements in teaching and learning can assist in forming a basis for further research into the issues affecting both students and teachers and the longer-term changes in teaching methods and styles that can result.

1.1 The impact of synchronous online teaching (SOT) on students

Students had to accept the unfamiliar online learning as SOT became commonplace (Jacques et al., 2021; Raes et al., 2020; Sharp et al., 2021; Zydney et al., 2019). Synchronous Hybrid Learning (SHL), which allows both in-class as well as online students to participate, became popular as the Covid pandemic receded (Raes et al., 2020; Saichaie, 2020). Student affinity to using technology was already strong. Z-Generation students, born after 2000, had been raised on technology and could readily pick up the new online tools (Linder, 2017a, 2017b). However, the same students would also readily blame technology when learning and retention were below their expectations, referring often to "Zoom fatigue" (Kohnke & Moorhouse, 2022). If students lacked the required self-discipline, online classes could deteriorate to passively "watching TV and not attending a lesson" (Raes et al., 2020, p. 283). Student retention with Z-Generation groups was found to have significant variance (Linder, 2017a, 2017b).

Student expectations and perceptions of the learning effectiveness of online/hybrid versus in-person delivery were the focus of Sellnow-Richmond et al. (2020). According to their findings, students tended to assume that remote or hybrid classes would result in lower retention, and thus lower grades. When 'shopping around' for courses, students expected transparency about the type and amount of work that online participation would entail, particularly for courses demanding an above-average level of engagement and workload such as 'flipped cum participants-centered hybrid' courses. Lacking such information, disgruntled students would later in their evaluations complain about the instructor. Students' negative attitudes, coupled with peer pressure, could reduce the engagement of the whole class.

Student engagement and interaction comprised a number of dimensions including, inter alia, behavioral, affective, and cognitive engagement (Dobbins & Denton, 2017). The normal attention span of students was about 10-15 minutes (Bunce et al., 2010) before they 'spaced out' (Wilson & Korn, 2007). Raes et al. (2020) found that students' relationships with their peers, combined with their intrinsic motivation were at their lowest in the hybrid-virtual setting. Also harmful to motivation, engagement, and directly affecting the reputation of online and hybrid learning, was the 'lift and shift' practice where instructors, unprepared for the changeover to online education, simply put their pre-existing course material online (Harvard, 2022a). This limited student attention and their ability to absorb and retain the content (Harvard, 2022a). Students were also potentially deprived of the educational benefits which innovative remote and hybrid modes could provide. Similarly, "monologue-based" teaching was typically shunned by students as it proved to be poorly suited for effective synchronous learning (Weitze et al., 2013).

Engagement and interaction increased if students experienced a constant change of pace and a variety of learning activities. According to Hwang (2018), online quizzes and polls were an effective way to get students' attention and build "affective" engagement, as established by Deci and Ryan (1985).

In short, students feared that remote or hybrid classes would result in reduced learning and therefore, lower grades. Better results could be achieved if students' expectations were addressed and managed beforehand, and if the typical 10-15 minutes attention span of students was taken into account through a variety or a constant change of pace, thus proactively keeping the students involved with innovative teaching tools.

1.2 The impact of SOT on teachers

The response of teachers to the rapid move to synchronous online learning was twofold: to utilize customary and proven responses to encourage student engagement and retention, and also to consider using broader innovative and value-adding approaches to teaching online classes.

The "radical shifts in the teachers' pedagogical methods…" identified by Raes et al. (2020, p. 282) led to the development of several approaches "…. to accommodate the new technology" required for synchronous online teaching.

Managing students' expectations and encouraging interaction in class became key. Curriculum alignment and activating learners became important for good learning and teaching. "... the lecturer should frequently ask questions throughout the lesson and be attentive to students' input" (McGovern & Barnes, 2009; Ørngreen et al., 2015, p. 285). Launching quizzes positively influenced students' motivation. Synchronous and hybrid learning was still in its infancy (Ørngreen et al., 2015), but empirical studies on different pedagogical scenarios and their impact on student outcomes had begun.

Classroom interactional competence, defined as the "teachers' and learners' ability to use interaction as a tool for mediating and assisting learning" (Walsh, 2013, p. 65), provided a basis for building incentives to actively engage students and was considered crucial to develop effective technology-mediated learning. The difficulties in sensing the general state of students' minds made it difficult to determine the best way to motivate online students. Developing multiple and diverse platforms for teaching became the main reaction of teachers to the rapid transition to online teaching. The tools of teaching were rapidly updated to include video and other visual materials, group work, games, and surveys to foster students' curiosity and motivation. Ensuring that the technology-enabled online and hybrid modalities are student-centered became a key issue. Changing the teaching model to forms of "flipped classes" to encourage student self-learning also became part of the core response from teachers, who were well aware that the degree of student engagement and attention span differed depending on the model of teaching used (Linder, 2017a, 2017b).

Student assessment while learning in hybrid courses was the focus of Stromie and Baudier (2017). The hybrid learning environment provided some evidence for the importance of the systematic collection of information about student learning (Walvoord, 2010). This relates to the synchronous environment in that learning objectives should be specific, directly linked to a unit of the course, and be measurable and observable from the student's perspective. Formative assessments allow teachers to see gaps in student learning (Angelo & Cross, 1993). These are often informal checks. Summative assessments give students the opportunity to show what they have learned during the course in a more comprehensive manner. These assessments tend to be formal and are usually graded. Recalling, summarizing, questioning, connecting, and commenting are activities that reassure students that they are truly learning (Angelo & Cross, 1993).

Teacher preparation time was also a key component of the success of synchronous online teaching. There was a need to completely master the technology, which had to be perfect in every class. For teachers, there was a 75% increase in the time needed for course design (Carroll-Barefield & Murdoch, 2004) which includes planning, content translation, content creation, and assessments.

Psychological stress was a potential consequence of the increased preparation and the rapid change to online teaching. "The instructors have a heavier mental load in hybrid teaching than in-person teaching … hyper-zoom or hyper-focus" (Bower et al., 2015; Ørngreen et al., 2015; Zydney et al., 2019). Psychological stress was found to have occurred among university professors in Israel (Besser et al., 2022).

A broader view of changes to teaching styles and techniques also emerged. This included blending the experiences of online and in-class teaching, thus accepting that the classroom environment was no longer either just online or just in-class. Teaching material can include short-form digital content and modular courses can complement or even replace semester-long courses. The incorporation of digital learning and hybrid classes can expand the scope and reach of teaching to a wider audience (Harvard, 2022a). Research has shown that the flipped classroom can improve student learning (Harvard, 2022b; Roehl et al., 2013; Shao & Liu, 2021).

2. Methodology

The case study method was used as this research aimed to contribute to the eventual building of theories for best practice in teaching in a post-Covid-19 environment. This choice was justified because the case study method is a useful bridge from practice to theory building (Eisenhardt & Graebner, 2007). The case study method was useful in providing a comparative study of three locations. It is descriptive and primarily exploratory rather than confirmatory, although it could be considered to be either one (Gerring, 2004). The three case studies provide observational data collected from students and faculty members from March 2020 when the switch to online learning due to Covid-19 was implemented through to July 2022, when the three schools returned to in-class teaching. We applied the methodology by assessing the literature in terms of the prevalent factors which are made up of student and teacher responses to online learning, and by compiling the case studies that reflect these causal factors. The process of data collection was through focus groups held to share faculty experiences, comments, and interviews with fellow faculty members. In applying this method, the authors collected anecdotal evidence, distilled it, and looked for differences as well as similarities between the three regions. Our findings will hopefully lead to similar comparative research confirming or negating the hypothesis that the educational issues, as well as solutions, are similar across continents and learning cultures.

3. Results

3.1 Case 1: CamEd Business School: Phnom Penh Cambodia: SOT (March 2020 to May 2022)

3.1.1 Transitioning from school to home teaching

The school switched overnight from in-class to online learning in March 2020, and all classes were synchronous online until December 2021. Prior to the switch, faculty received a brief, but very useful demonstration of online learning, showing how to use the "Chat" function to interact with students. Thereafter, the design and delivery of all online teaching was left to faculty members. Feedback and suggestions on how to improve online teaching were provided in formal faculty meetings, but many suggestions came through informal, peer-to-peer faculty contact.

3.1.2 Student learning issues with online learning

The students' capabilities to use the technology were not an issue, and students were quick to demand it. Therefore, it was important to ensure the technology was well set up for lectures, planned in advance, with assessment and interaction already built in. This took time and many iterations of running online classes to be achieved.

Establishing a good rapport with students was important right from the start, and all faculty members learned quickly in their own way, with most of them using 3-4 software platforms (e.g. Google Classroom Questions, Kahoot, PowerPoint, Mentimeter). As many students were reluctant to answer "cold-call" questions in class, many faculty chose non-attributable ways to interact using chat, brainstorming, or various team games and assignments. Encouraging student attention span and retention, Kahoot, which had PowerPoint slides interspersed with multiple choice questions (MCQs), worked well because students liked to win the Kahoot quizzes. Formal and informal surveys revealed that this approach was sufficient and "kept them on their toes". The inclusion of brainstorming and team games significantly helped with interaction, whilst open-ended questions (OEQs) encouraged students to express their opinions. This resulted in good interaction with the students feeling comfortable.

Managing student expectations, perceptions of learning effectiveness, and peer pressure were important. Although there was a culture of students sharing answers, there was also a positive willingness among them to learn. Many students, however, wanted to turn their cameras off, and only a few students chatted with their teacher during the lecture. This interaction was similar to the in-class participation rate. If students found a topic interesting and well presented, then they were more engaged, but all faculty found that they had to find their individual way to engage with students.

3.1.3 Teacher's response and impact on teachers

Getting used to the technology needed setting up and planning and required teachers to be in class well in advance of the lecture. Being able to use the software with confidence was important. Some teachers wrote in pens on the

screen, while others did not. Being able to use three or four software options provided the flexibility needed to teach each class in different ways.

Encouraging interaction in class was critical but it remained a struggle. Breakout rooms worked well unless there were too many groups to be visited during a class. Using the chat function was popular in breakout rooms and enough students liaised with the teacher in this way to make it worthwhile. Brainstorming, team exercises, and open-ended questions encouraged students to express their own views. It provided an environment where students could happily interact, as it was largely non-attributable and students enjoyed working together. Finding this way to encourage interaction and interest in learning represented a quantum leap in online synchronous teaching.

Finding multiple and diverse platforms for teaching was the key to success in online synchronous teaching and will benefit in-class teaching in the future, providing more diverse and effective ways for students to interact and learn. It took time and much practice, but the result was superior teaching.

Some teachers split the class into shorter sections to manage student attention span. Others tried to bring variety into every lecture, focusing on keeping the lecture content interesting rather than changing the style. Teaching styles evolved: rather than focus on an overall style of learning such as “blended” and “flipped learning” models, attention was focused on interaction with the online students, making lectures as interesting and as interactive as possible, and encouraging students to read more outside of class.

Teacher preparation time has always been an issue and even more so due to the move to online learning. Several months of preparation of overheads and quizzes resulted in a portfolio of available material. However, even the best-prepared slides and quizzes needed updating and a lot of preparation time was spent making the material flexible to reduce future preparation time. Once a way had been found to interact with the students, it became much easier to prepare material based on that method. Introducing team brainstorming and open-ended questions for synchronous online classes allowed students to reflect and consolidate learning both during the class and while doing homework.

Student assessments were difficult, particularly when they were based on individual student participation. It was particularly time-consuming to prepare MCQs. Finding a way to give students class participation points proved difficult. The best option was to record those students who did the informal quizzes and participated in online team activities. This worked reasonably well. Encouraging students to participate worked better than rewarding individuals for asking and answering questions, as there were too many students for this approach to work. Many students got near 100% for class participation whilst others (invariably those who did not show up for class) received very low scores. Assessment was an ongoing problem: it was difficult to be fair to all students and still have a reasonable distribution of student grades. This could be achieved, however, with a combination of MCQs and OEQs and the making of minor changes to previous questions which challenged students enough to distinguish those who had really understood the course material.

Dealing with psychological stress is always a potential issue in teaching, but during Covid, it proved to be more a motivator than a distractor. There was a lot of preparation but being well-prepared allowed teachers to enjoy the teaching experience. Stress was not more of an issue than pre-covid, rather it stimulated teachers to develop courses that students enjoyed and became, paradoxically, a rewarding part of teaching.

3.1.4 Lessons learned

The methods introduced during Covid which turned into long-term improvements included developing a style of interaction, getting to know students each in their individual way, building flexibility into the curriculum and each lecture, and finally, utilizing multiple platforms to engage students. Encouraging students to undertake quizzes, answer brainstorming questions, and complete assignments in teams really improved student engagement. Above all, the discipline of preparing lectures, quizzes, and assignments provided much more teacher flexibility. Class preparation was raised to a new level compared to pre-Covid days. All these practices benefitted both students and teachers. In short, the learning experience was made better because of the need to attend to detail and to be fully prepared for each class. Synchronous online teaching, which leaves no room to hide, resulted in the benefits of teachers being better prepared and more flexible, of students who had better engagement and interaction as well as better learning retention.

3.2 Case 2: University of Bolzano/Italy: Hybrid MBA course (fall 2021 to spring 2022)

3.2.1 Transitioning to online took place already in 2020

In 2022, the "online only" government directive of early 2020 was gradually relaxed and hybrid classes were allowed. Students could choose freely between in-person and remote attendance. Learning was made possible for quarantined students and those who otherwise could not attend in person. 15 of the 45 students opted regularly for the remote mode. The in-person students and the instructor had to wear medical masks at all times.

3.2.2 Student learning issues with online learning

The student's capability with technology was good, as they had been using Zoom/Teams for more than a year and many also enjoyed using the school's IT services outside of class for educational and personal purposes.

Managing student expectations and their perceptions of learning effectiveness is always an issue. The "flipped cum participants-centered" pedagogy of the course and the heavy workload had been explained before the class began and had been accepted by the students, at least in principle. Complaints about the mandatory pre-class reading assignments were nevertheless frequent.

The remote students were afraid that they might be less noticed than the in-person students, and, as a result, could possibly learn less, resulting in lower grades. Some demanded that their remote status be taken into account for the assessment. Most students finally appreciated the fact that the school was doing its best to provide them with a good education despite the Covid lockdowns. As 'working from home' became mandatory and also popular in Italy, students began to appreciate the necessity as well as the new benefits of the remote and asynchronous learning formats.

Establishing a rapport with students was difficult, at least initially, as the instructor as well as the in-person attendees always had to wear masks. This impeded any body language communication among the students and with the instructor: Smiles, winks, or frowns could only be guessed. Likewise, humorously meant comments and jokes usually fell flat or produced blank stares. Conversations, questions, and discussions had to be very direct and matter of fact. Rapport improved over time, largely through after-class conversations between students and the instructor. The instructor's IT fumbles also helped to lighten the atmosphere and allowed the students to feel more comfortable with their own skills.

Nevertheless, encouraging student attention span and retention in a light-hearted atmosphere was more difficult than before. However, the students responded well to a change of pace every 10'-15' minutes, such as short Q&A sessions (in class or chat rooms), and later presentations of their results when called upon. Interactions between the in-person attendees and the remote students were however rare, despite the persistent efforts of the instructor.

3.2.3 Teacher's response and impact on teachers

Getting used to the technology required setting up and planning and was more of a problem for the instructors than the students. The numerous YouTube videos dealing with the online tools were most helpful both for the instructor as well as some students.

Stimulating a critical interaction in class was greatly helped by following the steps in Bloom's taxonomy. Probing first what the students had retained and understood from the assigned case material created the basis for the subsequent analyses and evaluations of the case issues. Interaction between the remote and the in-person students was improved by fostering competition: (a) asking all students to form groups with a designated speaker to discuss the issues in competing groups respectively chat rooms, and (b) gently nudging/forcing the online speakers to discuss their group's findings with their in-person counterparts. Subsequently, the instructor kick-started a round of applause, followed by the comments of their fellow students and finally the instructor.

Splitting the class into shorter 'sprints' to manage student attention span was achievable, again by following the steps in Bloom's taxonomy. 'Beaming-in' case protagonists became popular with the students, as outside guests were more readily available for remote appearances than for in-person participation.

Juggling diverse and expanded platforms and modes for teaching was initially difficult. With time, students and instructors became apt in switching between in-person, remote, hybrid, and also asynchronous learning. Compared to the pre-Covid teacher-centered, synchronous-only learning mode, students now benefitted from (and liked!) the greater variability and freedom to decide when and where to study (e.g., during their commutes).

Students also appreciated the reduced learning stress and the potentially better retention. Just as 'working from home' became popular, many in-person and remote students increasingly welcomed the 'studying from home' made possible by the multiple formats.

The longer teacher preparation time was an issue, as the extra time now needed was not at all or only insufficiently remunerated. Consequently, many instructors favored returning to their pre-Covid materials and routines, thus forsaking the educational benefits of remote/hybrid pedagogies mentioned in the previous sections.

Student assessment was an open-book written exam for both the remote and in-person students with satisfactory results for the instructor as well as the students with only a normal number of complaints.

Stress was particularly noticeable in hybrid situations and in older teachers. Instructors were simultaneously trying to listen to every student, see all Zoom 'hand up' signs, ask questions, and think about answers/make comments, while, at the same time, paying equal attention to in-person and online students. After some practice, however, these challenges became routine.

3.2.4 Lessons learned, future improvements, and research

The assessment led the instructors to conclude that virtually all students had achieved the learning objectives and even produced meaningful/viable analyses and proposals for the 'beamed-in' case protagonists. The written open-book test, however, resulted in lower grades for the remote students. Trying to understand and explain this divergence, the instructor noted that the remote students were generally in the lower quartiles of most of their other courses as well. This anecdotal evidence led to the following tentative and still unresearched hypothesis: The lower grades of the online students are attributable primarily to the students' lower overall qualification/motivation and not necessarily to the attendance mode, i.e., in person or remote. This may be worth further quantitative research.

3.3 Case 3: San Jose State University of California: SOT (March 2020 to May 2022)

3.3.1 Transitioning to SOT

On March 26, 2020, all Californians received the lockdown order due to the Covid pandemic. Overnight, all in-person courses had to be taught online over Zoom for all California State Universities, and San Jose State University was no exception.

3.3.2 Transitioning from school to home teaching

Almost immediately, without prior preparation and training, all teachers had to be ready to teach online. Each teacher was given a loan computer and a mouse and resumed teaching on Zoom. Teachers and students had to quickly learn how to use this platform. While some teachers had already been using Zoom for their asynchronous classes pre-Covid, not all teachers on campus were familiar with it. Therefore, all teachers took an online crash course to learn how to get started. In the beginning, the internet connection was an issue because it was slow and often broke down. As a result, there were frequent interruptions during class time. Fortunately, being in Silicon Valley, the connectivity and speed issues gradually improved over the two years and fewer interruptions occurred.

Another issue was that both teachers and students had to find a quiet place in order to join the class. Since everyone was in lockdown, some families had little available indoor space and limited outdoor internet connectivity. When all family members had to stay indoors and share the limited WIFI speed, more interruptions occurred. Many issues such as space sharing and background noise forced students to turn off both their cameras and their microphones. Furthermore, the traditional in-person teaching modality was no longer effective for synchronous online teaching.

This remote teaching had many disadvantages as well as benefits for both teachers and students. Remote teaching eliminated traffic jams and parking issues at a very crowded campus but created interpersonal communication gaps among teachers and students. Reading students' body language and facial expressions is an important part of rapport. Not having these created a disconnect among all participants, especially with students who had their cameras off.

3.3.3 Student's experience

Students moved back home quickly after receiving the lockdown mandate. Some international students ran into trouble due to travel blockades. Two Vietnamese students had to fly back to the US before they could re-enter their own country. Also due to lockdown mandates, one student was able to enter his own county only on the third try. Once home, students resumed class attendance on Zoom, but class time had radically changed for Asian students. Due to a 12–15 hour time difference, Asian students had difficulties staying awake in the middle of the night. Many students wandered off to do other things during class, such as caring for babies, cooking, and talking on the phone. The lockdown truly changed people's lifestyles and searching for reliable internet connectivity dominated everyday activities and greatly impacted teaching/learning.

3.3.4 Teacher's experience

Teachers experienced the same issues as the students. The teachers also had limited space at home in order to provide a quiet and professional look for students to attend class. It was easy for students to turn off cameras and microphones, but teachers could not do the same thing because they had to 'keep the show going' which was sometimes frustrating.

During the online classes, teachers spoke to a black screen with students' names listed on small blocks. Facial expressions were not visible, and often, there was no response when a question was asked. Some teachers tried using Chat messages, but still, not all students paid full attention to the teaching. This was a clear disadvantage of synchronous online teaching. It is a one-dimensional live broadcast rather than three-dimensional face-to-face teaching. The interaction between students and teacher was often cut off, unlike in an in-person class, where teachers could observe students' facial expressions and gestures to give an instant reactive move to prompt a question to gain a student's attention.

The attention span of the students was the biggest issue in the synchronous online classes. Since the mode was a one-dimensional live streaming by a teacher, he or she was in a constant struggle of "teaching in the dark". Despite unlimited encouragement and pleas to the students to turn on their cameras, students remained distracted and turned off their cameras again. Once one student turned off a camera, then the others often followed. This was a peer-pressure phenomenon. If the teacher forced students to leave their cameras on, students would complain about the inhuman treatment due to their limited space issues. If a student got bored after watching the instruction delivery, he or she would just leave the class Zoom since the teacher could not see anything anyway. This vicious cycle developed into a new culture of a hide-and-seek game between the teacher and the students. Teachers quickly developed new modalities, varying activities every 15 to keep students' attention. Survey polls, pop quizzes, and student presentations were frequently designed with grading incentives by instructors to keep students involved.

3.3.5 Lessons learned

Many teaching styles were developed and tested for the new teaching normal such as 15-minute mode changes, and team discussions to deliver some short answers. Teachers had to consistently invent new teaching games to capture students' attention. Many institutions have published new modalities to enhance students' learning experiences. This was an ongoing struggle until everyone returned to campus. After TV was invented, everyone believed that radios would be replaced, but it still survives for a real reason - as a different form of communication. In-person classes will also continue to exist.

4. Discussion

4.1 Summary of the key findings

The summary of findings is firstly that video conferencing possibilities have become mainstream and are adding additional tools to the educators for existing target groups. Online tools have also widened the educational scope: schools can reach new target groups which have been underserved, leading to new educational opportunities for students and new revenue sources for educational institutions. Secondly, the issues and solutions encountered on three continents and different learning cultures were largely similar, and so were the solutions applied. This leads

to the conclusion that things learned from one continent may be transferable to other learning/teaching situations. These conclusions are somewhat tentative and need corroboration by other researchers.

4.2 Contributions to earlier literature

This paper contributes to the earlier literature as the three case studies describe and assess the teacher/student responses to the rapid change to online teaching in a cross-cultural setting. What is new is that the issues which drive successful teaching in the online environment, student engagement, motivation, and assessment are common in all three cases. While there are many commonalities among the teachers' responses, they, nevertheless, remain individual and unique.

Teachers in each case study resorted to Graham's "educational lifesavers" (Graham, 2013) so they could rapidly develop a portfolio of teaching techniques that could be immediately applied online. The key issue was ensuring student attendance, motivation, and participation, which is consistent with McGovern & Barnes (2009), and Ørngreen et al., (2015). Methodologies for teaching developed rapidly, supporting the findings of Linder (2016) and Subramani & Iyappan (2018). This research found that teachers adapted their teaching strategies in their own way to achieve the common objectives of student engagement and motivation. Dealing with the unfamiliar environment of online teaching was an issue for students and teachers alike. The findings support those of (Jacques et al., 2021; Raes et al., 2020; Sharp et al., 2021; Zydney et al., 2019), in that students had to adapt to the online environment as much as teachers, and technological awareness amongst the Z-Generation, consistent with the findings of (Linder, 2017a, 2017b), was not sufficient to ensure that learning in the online environment would equate to learning in the classroom. Self-motivation and adaptation was key requirement for students too. Student expectations were an important issue, as put forward by Sellnow-Richmond et al., (2020), and this research finds that student expectations varied depending on the culture of the class. Some classes showed a positive willingness to learn, whilst others (individuals or classes) were quick to blame technology or point to such factors as "Zoom fatigue" or to fault the teacher. This put pressure on teachers, either explicitly or implicitly, to ensure that the engagement and motivation of students was a key success factor in the new online teaching environment. Students' relationships with their peers, as put forward by Raes et al. (2020), were also a critically important issue to student learning, and peer group pressure was an important determinant of the class culture. This research supports the findings of Hwang (2018), that online quizzes and short module-based teaching can make lessons more attractive to students. The impact on teachers mirrors the impact on students, and developing multiple and diverse platforms for teaching was found to be key to the teacher's response, consistent with Linder (2017a, 2017b). The radical shifts in teaching pedagogy, as set out by Raes et al. (2020, p. 282) is supported by this research. Teachers encouraging and being attentive to student input supports the findings of McGovern & Barnes, (2009); Ørngreen et al., (2015). The key issue of both teachers and learners interacting to build the learning experience (Walsh, 2013, p. 65) is also supported by this research. Aside from the clearly important motivation and interactions with students, this research also supports the need for the systematic collection of data on student learning as key to the teaching response (Walvoord, 2010). The issue of teacher preparation (Carroll-Barefield & Murdoch, 2004) is clearly supported by this research. The mental load on teachers (Bower et al., 2015; Ørngreen et al., 2015; Zydney et al., 2019) and even though possible psychological stress issues (Besser et al., 2022) were also found to be important, this research discovered that the pressure to prepare can result in more motivation for teachers who would then be better prepared for future classes. We would support the broader view that the changes to teaching methods brought about by the Covid-19 pandemic can bring about more radical changes to the classroom in the longer term (Harvard, 2022). We would suggest that these long-term changes to teaching were partly due to the technologies available, it is just that the Covid-19 pandemic forced their earlier adoption for the online classroom.

4.3 Concrete suggestions for future practice

Based on the results, the authors suggest that practitioners consider the following recommendations for future practice. Teachers should learn from what has worked from the pandemic to address the major issues of student engagement, motivation and assessment. This will undoubtedly involve a broader platform of technology and most pre-Covid-19 teaching practices. The clearest message from this research is to understand and build on what works

for an individual teacher rather than try to generalize and standardize teaching. The new normal will surely include the elements of hybrid, remote, and flipped pedagogies, although the exact format of the classroom in the future is evolving and yet to be determined.

4.4 Limitations of research

The limitations of this study are based on this qualitative research which raised issues from the literature and used case studies to support the changes in pedagogy happening in practice. These findings need corroboration by further research. The three case studies used in this paper support many issues raised by the literature but further research is needed to consolidate the new practices adopted in teaching due to the Covid-19 pandemic. Most likely, they might have been adopted in any case due to the improvements in technology that enabled online learning.

4.5 Suggestions for future research

Future research on this topic can extend the knowledge of student and teacher responses to online teaching beyond the rapid changes brought about by the Covid-19 pandemic. This will extend into building knowledge of best practice teaching in online and hybrid settings. Further research could explore the opportunities to improve technologies, enabling such improvements as getting a discussion going in a hybrid setting between the in-person, on-campus class and the remote part of the student body. Research could also explore the underserved target groups in the local communities that virtual teaching can access and explore the extent to which the market for education can be broadened.

This research has raised issues of the student and teacher response to the Covid-19 pandemic which have been put forward in the literature. The support for issues of student motivation and engagement, and the teachers' response by developing multi-levels of teaching modes is clear. We suggest further research to determine whether simply attracting students' attention would lead to improved student learning. More research needs to be done to determine how the attraction to lectures leads to the motivation to learn and to extend the study to answer questions of cognitive engagement as set out by (Dobbins & Denton, 2017).

4.6 Conclusion

The pandemic may be a blessing in disguise for higher education worldwide just like "working from home" for many offices. There could be significant competitive advantages for innovative educational institutions and their students. Benefits can include a superior teaching/retention experience for existing faculty and students, enrollment of more (online) students by providing educational services for previously unreachable categories of potential learners at limited marginal costs, reducing the cost per student significantly.

These are, in summary, the authors' conclusions and recommendations, based on the recent literature and their own experiences in Asia, Europe, and North America: (a) re-engineer the classroom experience, blend proven educational methods with pandemic-induced innovations, (b) redesign the content delivery into shorter "sprints" in line with the student's attention span; and, (c) significantly increase a school's outreach to service underserved student groups and, in parallel, offer online teaching opportunities to former/potential educators.

Comments / Disclosure

The way this contribution came about is by itself a verification of the Covid Paradox and how research (and later teaching) can benefit from Covid-induced disruptive innovations. The authors teach at universities in Asia, Europe, and North America, and have only communicated with each other via videoconferencing. All three are Affiliate Faculty Members of the Institute for Strategy & Competitiveness (www.isc.hbs.edu) of Harvard Professor Michael Porter. Thus, and in the spirit of full disclosure, the motivation and thrust of the paper are likely to reflect the Porter and Harvard bias toward innovation. Furthermore, the paper was triggered and influenced by the 2022 "Harvard Future of Teaching and Learning (FTL) Task Force Report" (see https://ftltaskforce.harvard.edu/files/future-teaching-learning/files/harvard_ftl_final_3.8.22_2.pdf) and related publications (cf. the section on Educators' Responses)

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