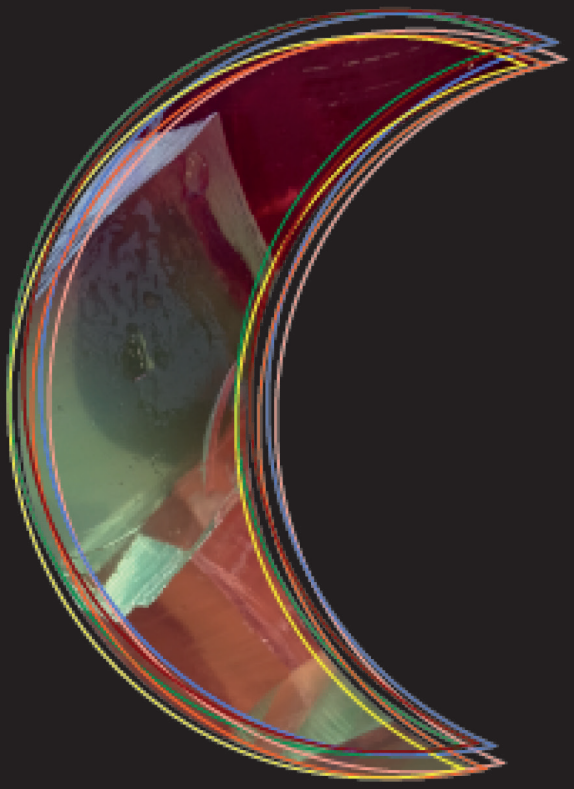
Pandemic and remote teaching in Higher Education

Susana Gonçalves e Suzanne Majhanovich (Coord.)



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Coordination

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Preface

Susana Gonçalves and Suzanne Majhanovich

This book results from a call for papers in the international arena aiming to advance reflections on the impact of the present public health crisis on higher education. Our target was not solely to consider the lockdown effects but also the sociocultural, technological and economic changes that were already occurring globally. All these changes were accelerated by the pandemic, which has come to be considered unanimously as a historic turning point in society and its institutions, especially in higher education.

Currently, higher education is moving away from its traditional format, which was based on the concept of formal education and on an idea of the university that was already beginning to clash with society's organization in this first quarter of the 21st century. The pandemic and the transition to emergency online teaching formats have amplified the use of digital technologies in teaching and have given rise to various strategies of digital teaching that were previously little known, little used, or even non-existent.

After one year of lockdown, it is relevant to compile the experiences, studies and reflections associated with this new situation. It seems to be clear that there will be no going back and that many of these experiences have proven to be effective practices that may be generalized and reinforced in the short term.

Thus, researchers interested in pedagogy in higher education and in curriculum management in higher education have developed a huge critical corpus of studies, colloquia and reflections on how the universities worldwide have adjusted and responded to the lockdown and the forced distance teaching and learning. Remote emergency

education has become the key word in this global response, allowing education to continue to function and avoid closing universities indefinitely.

In this manuscript, we present some of these reflections, coming from Portugal, Russia, China and Australia, as well as case studies in various disciplines of universities in the People's Republic of China, Russia and Germany. These works, together with the studies presented in the previous book of this collection (Gonçalves & Majhanovich, 2021a) and another forthcoming manuscript (Gonçalves & Majhanovich, 2021b), have provided enough information to conclude that a massive transformation of Higher Education is on the move.

The strengthening of the digital competence of teachers and students, the reinforcement of technological and multimedia tools at the service of teaching, the greater globalization of HEIs and, above all, a deep curricular revolution, will completely change the way we view higher education, its functions and its operating modes.

The book is comprised of two parts, the first covering the Impact of the Pandemic in Higher Education, with four chapters.

In the first chapter, Moreira and Ferreira discuss the concepts of hybrid Learning and virtual Learning Environments resulting from the accelerated evolution of the technologies of communication. According to the authors, remote emergency teaching forces us to rethink and create innovative digital institutions, which are able to transform positively the education reality, which will no longer be unblended and will be hybrid and disruptive in space, presence, technology and culture, all of these dimensions simultaneously analogic and digital. This urge demands reengineering the learning processes and promoting cultural changes in both the institutions and the individuals.

Pervukhina and Vidrevich discuss remote teaching and learning in the context of the Russian higher education system transformation after the Covid-19 pandemic. The tertiary sector in Russia is currently undergoing major changes due to adherence to the Bologna principles and transition to outcome-based education. Russian

universities and faculty members were still challenged by this new approach when the lockdown forced the entire system to "migrate" from traditional in-class face-to-face education to online education, bringing extra difficulties and turmoil to Russian universities, the majority of which had no experience with distance learning. The authors examine approaches and solutions offered by online learning in Russian universities, with special focus on the case of Ural State University of Economics and discuss benefits and losses of exposure to forced online learning for both faculty and students. Finally, they make a few recommendations based on shared European experience on how to implement effective instructional strategies in online education.

From another country perspective, Singh, Nair and Watson discuss the transformation in Higher Education in Australia during the COVID-19 Pandemic and report a study on the Australian academic staff perceptions of the forced change in delivery at non-traditional delivery sites, home-based delivery of lessons. This study, across 12 Australian universities/tertiary institutions, identified factors, which affected students' ability to effectively engage in the online environment, such as lack of access to connectivity, social and emotional factors, as well as technological factors.

The results show that the most effective tools adopted for communication with students were found to be the interaction provided during the live online sessions, and emails. Authors conclude that some areas of policy that need to be adapted by Australian universities include the design of systemic capacity building for academic staff in the effective use of online tools to further enhance the student online experience. Besides that, health considerations should be taken into account when staff are working at home; including processes to ensure regular engagement with staff to discuss teaching and learning matters and to provide counselling support to staff to handle the isolation; and providing the proper infrastructure to handle the influx of students in the digital environment.

In the last chapter in this first part, Costa focuses on Multimedia Learning and Internet Resources in Pandemic Times. The

chapter, of a more practical scope, begins with a brief approach of psychoeducational aspects in pandemic times and reviews the main principles of multimedia learning. After a brief description of the legal context for multimedia materials' use and a few notes on image and sound edition, the author suggests resources and locations that can be useful to create e learning documents for digital learning and provides a list of websites that offer online courses.

Moving Online as an Emergency Strategic Approach: Case Studies, the second part of the book, consists of six cases studies. The first, presented by Glotova, Korolev and Razuvaeva, examines the challenges faced by students and teaching staff while transferring to distance education at the Penza State University. The study considers the changes in undergraduate and graduate programmes and in lifelong learning and describes students' satisfaction with remote learning and teachers' practices in problem-solving while adapting teaching methods and arranging educational process in presenting course content, motivating students, organising assessment, including peer assessment, using open-source educational resources and interactive tools in training.

Kusse focus his chapter on the experience of Online Teaching Slavic Studies at the Technical University or Dresden, in Germany and discusses how the radical change in teaching poses particularly difficult issues in philology, where direct exchange and lively conversation are necessary for good teaching. The author also lists some advantages and new possibilities, which are of interest especially in historical linguistics.

The next four case studies come from two different departments in Chinese universities. The first two cases are from the Jiangxi Normal University. In the first, Liao & Sheng discuss Blended online teaching and formative assessment in the college course, Early childhood psychology. The blended mode combined recorded video lecturing and scheduled live-streaming the course through the QQ Web meeting software. Students' online-learning data were used not only for students' assessment but also to evaluate the effectiveness of the blended course.

In the second case, Yan & Heping present responsive online

teaching in Media Management, a course for communication undergraduates, and self-efficacy. The methodology is described. As formative assessment has been adopted for the course, every phase of student learning was measured, including their attendance, online comments, video watching, exercises in- and after-class, and presentations. Teaching effectiveness was extracted from this formative assessment data and the students' online course comments and questionnaires conducted at the end of the semester.

The final cases are from the University of Sanya. The first, by Chen and Yang, describes the move to add a strategy of blended teaching system and its outcomes in the Public Finance course. After describing the procedures and results, the authors discuss the properties of online teaching and provide suggestions for system construction, teaching practice and organization management of online teaching, highlighting key points such as ideological understanding, toolkit selection, and pedagogical design.

Finally, Shaoying presents a survey in which the Saxo Fintech Business School, one of the 21 schools and departments of the University of Sanya, participated, aiming to collect feedback from students and teachers on online teaching. The results of the survey, faculty seminars, interviews, and teaching practice, are summarized and the valuable experience and results of emergency online teaching extracted in order to inform future teaching models. The authors conclude that the development of online teaching requires further cooperation among teachers, platform developers, universities, and the government.

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Part 1
Impact of the pandemic on Higher Education

Chapter 1

José António Moreira and António Gomes Ferreira

Blended and hybrid environments in Higher Education in times of the pandemic

The development of technologies and communication networks has fostered the emergence of a reticular society characterised by marked changes in the economy and labour market, bringing in new paradigms, models, educational communication processes and new teaching and learning scenarios in higher education. What one did not expect, however, not even teachers who already used virtual learning environments in their practices, was that the change would have to be so sudden due to the spread of a virus that caused physical distancing, rendering the presence of teachers and students in the geographical space of higher education institutions unfeasible, and forcing teachers to adopt emergency remote teaching substantially different from the online teaching practices already consolidated in this field, with their own models, and to rethink their teaching practices by embracing digital technologies.

The public health crisis and online emergency remote learning experiences across Europe and in the world in the spring of 2020, and the dual system that articulates physical and virtual geographies, has also made us realise that instead of fully returning to the ways in which higher education institutions worked, it is also possible

to think about a more blended, more hybrid learning system, by adopting sustained innovation processes that offer a diverse combination of types of presences (physical and digital), times (synchronous and asynchronous), technologies (analog and digital) and, above all, different learning spaces and environments (physical and virtual).

More than integrating physical and virtual learning environments, hybrid learning must affirm itself as a full learning concept characterised by the use of combined solutions, involving the interaction between different models, pedagogical approaches and technological resources. The interaction of pedagogical approaches is a direct and indirect consequence of the combination of various resources within differentiated spaces. Such an interaction implies that theories often considered mutually exclusive must coexist, as is the case of the classic opposition of behaviourist and cognitivist theories. The adoption of different technological resources is one of the ways of rendering the dialogue between these different approaches effective, as each resource implies not only specific forms of knowledge management, but also specific forms of interaction.

In other words, more than integrating physical and virtual learning environments, hybrid learning should be seen as a dynamic strategy involving different technological resources, different pedagogical approaches and different times, while being a highly complex communication process that promotes a number of interactions between human and non-human actors that can be successful, provided that all of these elements are incorporated therein (Monteiro, Moreira, & Lencastre, 2015).

In times of profound changes, of a world structured in a complex way wherein the analog and the digital, the real and the virtual, the human and the machine, the offline and the online coexist, acknowledging that we live in a new social, cultural, economic, political and even ethical order, and given the breakneck speed at which digital technologies are developing, we are now facing the need to rethink the educational paradigm so that communication may take on the crucial role of uniting and bringing together human and non-human actors. This centrality of the communicational process, and

of the teacher, the student and of technology echoes the significant communication variables such as interaction, connection, linkage and participation, essential to a paradigm based on an Augmented Human Intelligence approach (Harasim, 2015) that promotes and increases human action and interaction and that does not automate or reduce this action, as in the Artificial Intelligence (AI) approaches.

In this sense, digital interactivity emerges to give another meaning to and expand the existing concept of interaction, since it presupposes participation, cooperation, bidirectionality, and multiple linkages between information and the actors involved (Silva, 2006).

Therefore, to speak of non-disruptive processes of sustained innovation in this context means that these hybrid forms are an attempt to offer "the best of both worlds", that is, these (sustained) hybrid innovations include both the old and the new and can be an answer to the education system, because in fact this "promise" of the "best of both worlds" can successfully combine the advantages of the physical classroom with the benefits of the virtual classroom, thus allowing all teachers to be integrated into this process of transition and change. The implementation of blended learning models not as a purely disruptive process, but rather as a sustained innovation process will allow us to make progress towards the idea of an educational community united in its desire to change. We therefore believe that this is the path to change to more digital higher education institutions.

Blended Learning and Hybrid Learning Models

As stated earlier, hybrid education is regarded as a dynamic strategy involving different learning environments, different pedagogical approaches, multiple technological resources, and a complex communication process between human and non-human actors. As such, and despite the many definitions found in literature, the term 'Blended Learning' is understood as being part of this hybrid reality, as the combination of different learning environments, whether physical or virtual. This does not mean to say that there is more than once concept, but this may depend on the approach and the

focus, for example, if it is more focused on technological aspects, or on the pedagogical potential.

Blended Learning (or bLearning) appeared as one of the most popular pedagogical concepts at the dawn of the 21st century. In the past fifteen years, teaching and research experiences in blended learning increased significantly as a result of technological developments and the different initiatives to pedagogically innovate by integrating digital technologies in education systems (Güzer & Caner, 2014).

The Blended Learning approach is highly regarded for its flexibility, as it allows teachers to propose various teaching and learning solutions using digital technologies, creating either student-centered or teacher-centered didactic designs. One of its greatest benefits is indeed its flexibility in the way time is managed, in how contents are taught, and in how students interact with the resources, with their peers, and with the teacher. While in the online or physical environment the format is chosen and used exclusively (and, therefore, without the benefits of the other), blended learning can offer the best of both worlds in a unique and integrated experience. In other words, those two worlds can generate a third world resulting from the linkage between both, thus offering a new integrated learning experience. This means that if students are learning contents in a blended format, the online and physical environments act together to provide an integrated learning experience. A different case is where students learn some contents online and in the virtual classroom and repeat these very contents in the biological space of the classroom. Why not think of complementary realities where different skills are learned? For example, why not develop an integrated learning activity that promotes the development of synchronous oral communication skills in a physical scenario, and asynchronous written communication skills in a virtual scenario? Why not allow students to be actors in the educational process with a physical dimension and virtual actors in an integrated reality? These different realities offer unique advantages that can be difficult, if not impossible, to replicate in others, which is why combining them can constitute very valuable learning opportunities. The key idea is that blended learning involves the actual combination of whatever learning environments are used in teaching the subject

area, be they analog environments, physical environments enriched with digital technology, or virtual, augmented reality or immersive environments. It is therefore necessary to find the best models that allow the consistent organisation and operationalisation of pedagogical practices.

Bonk and Graham (2006) identified three major categories of blended learning implemented in different phases: enabled blended learning, enhancing blended learning and, finally, transforming pedagogy from blended learning. In the first category, the system is used to increase access and flexibility to the learners by providing learning experiences to those previously carried out in the traditional classroom. The second category already shows some differences in the physical environment, which is complemented with the online component, or vice-versa, and in a third category the pedagogy is changed from the use of technology, by changing from transmitting information to an active and interactive student-centered model.

Other proposals in turn provide for different approaches in this area, depending on the approach adopted, whether technology-centered or pedagogically-centered.

This is the case of Carol Twigg, who at the beginning of this century proposed five models of integration in the different face-to-face and online moments: the "emporium model", in which in-class activities are replaced by an online resource centre; the "fully online model", in which learning activities take place entirely in the virtual environments; the "buffet model", in which the learning environment is customised to give the student a tailored response; the "supplemental model", which uses a virtual learning environment to support in-class activities; and the "replacement model", in which some in-class activities are replaced by online activities using virtual environments (2003).

On the issue of combining learning environments, Allen, Seaman and Garrett (2007) also sought to define a benchmark based on the percentage of physical and virtual presence (Figure 1).

PERCENTAGE OF CONTENT MADE AVAILABLE ONLINE	TYPOLOGY	DESCRIPTION
0%	*Face-to-face*	No online environments are available. All classes take place in a physical environment.
1% to 29%	*Web Facilitated*	Use of the Web to facilitate what essentially belongs to the physical geography. Use of a learning management system to provide resources only and not for developing learning activities.
30% to 79%	*Blended*	Articulation between online environments and face-to-face activities. A substantial amount of contents is offered online, and online activities and discussion are promoted online and in-class in a combined mode.
80+ %	*Online*	Most or all of the contents are offered online. Interaction and activities are carried out online; it may or may not include face-to-face activities or supervised test(s).

Figure 1. Learning classification adapted from Allen, Seaman and Garret's model (2007)

Finally, note also that the Clayton Christensen Institute[1] created the taxonomy for hybrid education programmes according to four models: the Rotation Model, the Flex Model, the Self-Blend Model, and the Enriched Virtual Model (Horn & Staker, 2012).

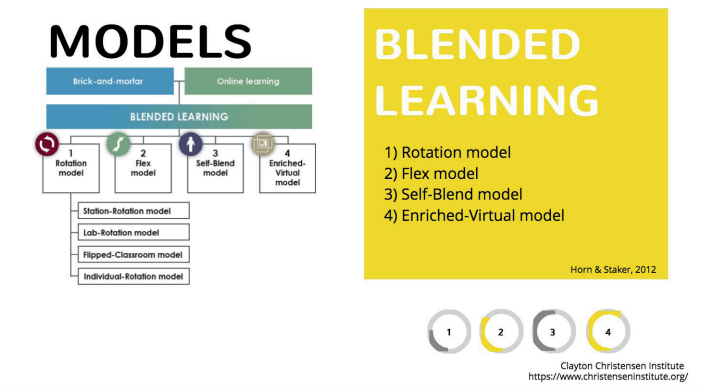

Figure 2. Blended Learning models adapted from Horn & Stacker (2012)

[1] https://www.christenseninstitute.org/

In the Rotation Model, students alternate between learning environments according to a fixed roadmap or at the teacher's discretion, where at least one of the activities is carried out online. Students often alternate between environments with different learning activities, such as group or individual work, or written assignments in analog and digital spaces. The Rotation Model is divided into four sub-models: Station-Rotation, Lab-Rotation, Flipped Classroom, and Individual Rotation.

The Flex model lets students navigate according to fluid schedules between learning activities and according to their needs. Online learning is the backbone of student learning in a Flex model. Teachers provide support and instruction on a flexible, as-needed basis, while students work through the course curriculum and content. This model can give students a high degree of control over their learning.

The third model – Self-Blend – is the most clear case of pure disruption. In this model, students carry out their activities in virtual learning environments supported by online teachers. The Self-Blend can also involve in-class activities, as in the Flex model, but the difference is that in the Flex model support is given by a teacher in a physical space, while in the Self-Blend model the teacher is available online. In this model, the traditional classroom is dematerialised, as students do not use a physical classroom, although in some situations they can carry out their activities in cybercafés or physical learning laboratories.

Finally, the Enriched Virtual model is an alternative to full-time online school that allows students to complete the majority of coursework online at home or outside of school, but attend school for required face-to-face learning sessions with a teacher. Unlike the Flipped Classroom, Enriched Virtual programmes usually don't require daily school attendance; some programs may only require twice-weekly attendance, for example.

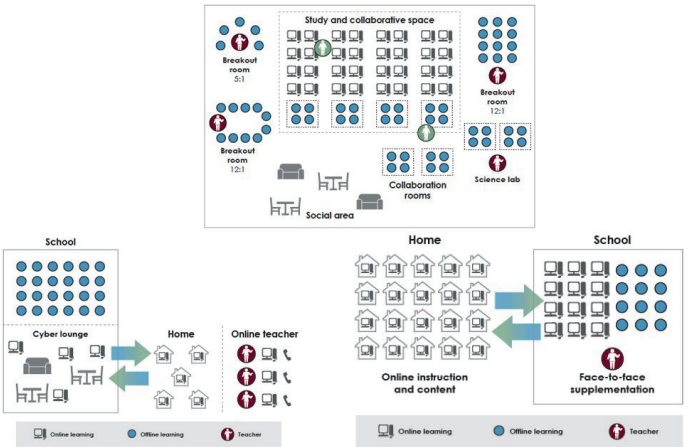

Figure 3. Flex, Selfl-Blend and Enriched Virtual Models adapted from Horn & Stacker (2012)

Regarding the aforesaid models, it should be noted that they can be used in various combinations, giving rise to customised learning programmes. The categories are not mutually exclusive. These models can be combined in many ways. With regard to these models, it is interesting to note that the Christensen Institute has a database tool, the Blended Learning Universe (BLU), for organising and presenting data on hybrid programmes, available at www.blendedlearning.org.

As for any learning environment, learning activities for hybrid environments must be carefully planned in good time before the start of school activities. In this case, preparation thereof will take more time because the combination and articulation of environments requires a more complex pedagogical process management.

The main steps to be considered in the plan include the definition of strategies to be developed, the outline of the main activities, and the selection of the most appropriate teaching resources for each environment.

This plan, for example, may be a pedagogical guide, a roadmap for all activities, organised according to themes or weeks, and should

inform students about what they are going to learn, in which environment the learning will take place at a specific time, what strategies and activities will be developed, and the result of those activities (Moreira, Henriques & Barros, 2020).

Students find it very useful to associate each topic to the environments, contents, resources and software needed to carry out the activities. Moreover, it is essential to help students prioritise and map out their tasks suggesting, for example, a number of approximate days and hours to dedicate to the different phases of the activity.

In planning the teaching activities and drafting this plan some aspects must be considered. As mentioned before, it is necessary to plan in order to create and recreate the activities, and to realise that the planning of learning activities in hybrid scenarios requires much thought, as it is not enough to just convert the traditional classroom activities into online activities. These are different realities that should not be replicated. It is also important to identify the activities that capitalise on the "strengths" of each type of environment, as some of these activities may be validly developed in different environments with the same pedagogical efficiency.

Another aspect to take into consideration is the creation of appropriate contents and selection of resources for virtual learning environments, which is a lengthy and time-consuming process. That is why it is important to start outlining all the learning activities well in advance as we go along until the final design is obtained.

It should also be noted that the integrated design of activities in the different environments is equally important, if not more so, than the technology used. All too often there is a tendency to design many activities and provide too many resources, resulting in a heavy workload for students and negative impact in their academic performance.

The development of activities in an integrated way in physical, digital and virtual environments should be the main focus. Linking all learning ecosystem environments is crucial to avoid the repetition and overlapping of activities. The idea is not to create parallel activities, but integrated activities that develop within the different

environments, within the designed ecosystem, where the learning communities, the teachers, the students and the contents are the biotic factors that represent the living part of the system (the human and the digital species), whereas digital technologies represent the abiotic factors, the non-living parts of the ecosystem (Moreira et al., 2020).

Finally, the need for developing flexible plans in case any of the activities designed cannot be implemented should also be highlighted. Plans should not be too strict, as it may be necessary to develop a specific activity in another environment that was not initially foreseen for technical, pedagogical or other reasons.

Final considerations

As we have already mentioned, the Blended Learning approach is highly regarded for its flexibility, since it allows for various teaching and learning solutions using digital technologies, creating either student-centered or teacher-centered didactic designs.

In the past fifteen years, blended learning experiences in education have increased substantially as a result of the different initiatives aiming to innovate pedagogy by integrating digital technologies in higher education.

Depending on the current reality, this approach allows the development of flexible and customised learning solutions.

But further to understanding this matter, this hybrid reality also requires teachers to be innovative and highly skilled, as well as a change in the education system and its support mechanisms, in terms of legislation and structures, resources, professional development, and quality assurance.

For example, a flexible legislative "framework" is needed to allow changes to take place, one that values, for example, learning in virtual environments, defines how curricula and assessment can be addressed or adapted to work effectively, defines guidelines for more flexible and combined teaching and learning structure and, finally, requires all educational actors to undertake training in this field.

This change in approach, however, is only possible if teachers and students actively collaborate in this process, as it also depends on their ability to participate actively as individuals and groups in a spirit of creativity and research.

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Chapter 2

Irina Pervukhina and Marina Vidrevich

The pandemic as a trigger for Higher Education transformation in Russia

The spread of the coronavirus disease known as COVID-19 has had a tremendous economic, political and social impact on our world. Education is also facing the largest disruption in the modern era. Educators and students around the world felt the ripple effect of the coronavirus as colleges and universities were instructed to shut down after the coronavirus was declared a public health emergency in many countries (Ozili, 2020). According to the UNESCO Institute for Statistics data, the COVID-19 outbreak disrupted the education of at least 290.5 million students worldwide. Due to cancelling in-person classes, the global academic community was forced to explore new ways of teaching and learning. Higher Education Institutions (HEIs), including universities, colleges and other institutions in tertiary education, around the world are responding to travel bans and quarantines with a shift to online learning on a massive scale (Perrotta, 2020). This has proven challenging for both students and educators, who have to deal with the emotional, physical and economic difficulties posed by this disease.

This global crisis has triggered a reconceptualization of education provision at all levels. The intensive use of different technological platforms and resources to ensure continuity of learning outside HEIs is the boldest experiment in educational technology – albeit unexpected and unplanned (UNESCO-IESALC, 2020).

Many scholars questioned if higher education was prepared for the forthcoming digital era of learning (Houlden & Veletsianos, 2020; DeVaney et al., 2020).The data (Mitchell, 2020) showed 60% of HEIs reported online learning provisions in their strategic planning prior to COVID-19, but only one third appeared to provide full online courses in some form.

Developing robust online platforms has become necessary to offer continuity in learning. Yet in many countries the shift to 'going digital' has not been easy due to disparity in socio-economic backgrounds of students and the quality of educational institutions, Faculty are being called upon to redesign curricula and redefine learning outcomes in order to meet current and future needs and to develop effective tools that will ensure students stay involved and active in the learning process. Moving away from traditional pedagogies in most HEIs and the demand for quality educators will shape the way higher education moves forward from this crisis (UNESCO, 2020).

This chapter begins a conversation by exploring the wave of responses to COVID-19 from universities globally. We continue to address this issue in our country-specific discussion of the approaches to higher education in Russia. Then we focus on a case of Ural State University of Economics (USUE, Ekaterinburg) to illustrate how a regional university was and is meeting the challenges posed by the COVID-19 pandemic.

Responses to COVID-19: Global perspectives

The immediate actions that HEIs worldwide were taking to address the emerging circumstances were roughly the same irrespective of the level of economic development, size of the country and political regime. Most countries implemented the following measures

counteracting and slowing down the COVID spread (Crawford et al., 2020; Rumbley, 2020):

- Campuses were shut down; students were sent home and teachers had to cancel classroom teaching.
- The technology infrastructure was rapidly progressing towards online teaching and learning.
- National governments issued regulations enforcing measures for self-isolation. They worked out recommendations and guidelines for remote instruction delivery, in particular with regard to standardized tests and examinations. Examination arrangements were changed.
- Information channels for students and academic staff were designed, and social and emotional support was provided.
- Fee payments were postponed in order to assist students.

Responses to COVID-19: Russia's perspectives

At the same time, Russian HEIs deployed measures that demonstrate a different response to a complex challenge. University closure skyrocketed the demand for distance learning. The country's Ministry of Higher Education and Science recommended that all universities should switch to distance learning as a preventive measure against the spread of coronavirus (Higher School of Economics, 2020; Ministry of Science and Higher Education, 2020). The pandemic has revealed great non-uniformity and the risk of widening the gap between Russian universities. By mid-March 2020 only 11 % of Russian universities had had the necessary technological and technical infrastructure to support virtual courses. Every tenth university had no resources or digital capacity to move to full online delivery. Nevertheless, by the end of March, 60 % of Russian universities provided distant learning without major interruptions. Another quarter of HEIs offered studying from home, but experienced occasional problems.

From the beginning, Russia's HEIs took exemplary measures to safeguard health on campus and in buildings. One of the measures

was to enact requirements for social isolation for academic staff aged 65+. Studies were ceased for a week, from 28 March to 5 April. A two-week vacation for students was declared from 28 March to 5 April. The period from March 30 to April 3 was announced as "stay-at-home" at one's full pay both for faculty and non-teaching staff (Higher School of Economics, 2020). The faculty had to use this break for designing teaching materials and placing them on the university portal to make these resources available for all students, both Russian and international.

To guarantee the continuity of the teaching activity and support the development of teaching capacities for virtual education the Ministry facilitated the involvement of the leading Russian universities in designing regulations and guidelines for implementing online classes. More than 15 different instructional materials were prepared, covering a variety of issues from the logistics of distance education, campus and dormitory management, and student employment to organization of volunteering work and psychological support for students and staff.

In addition to working on ensuring an adequate transition to the remote learning format, the Ministry and HEIs also had to address arising social problems. More than half of all students experienced income losses, which prompted universities to adopt programs for supporting student employment on campus in order to alleviate the strain and provide students with additional opportunities to earn money and continue their education.

Special attention was given to the quality of students' extra curriculum activities and volunteer work. Students were creating voluntary groups to help support fellow students and members of their communities during the advised social distancing and isolation measures. Put in place as of June 16, 2020 over 117 000 volunteers were engaged in the all-Russian #мывместе[2] Project (Ministry of Science and Higher Education, 2020).

[2] we are together

Admission

The outbreak also disrupted the admissions process for 2020/2021 entry. Some universities began planning and using virtual webinars and tours to support perspective students in the admission process. HEIs focused on introducing more flexible admission processes, delayed start dates and relaxed some entry requirements. A new mode of application – online application - was introduced. The mandatory national tests for high school leavers that affect the admission to Russian universities, having originally been scheduled for June, were rescheduled for a month later to July. High school students who were not planning to enter the university were allowed to skip the national test. According to the Federal Education and Science Supervision Agency, approximately 12% of school leavers opted for this opportunity.

Impact on students

Moving learning from classrooms to homes at scale and quickly presents enormous challenges. Russian students were facing the same difficulties as their peers globally: social isolation, financial issues, internet connectivity and, generally-speaking, pandemic-related anxiety (UNESCO-IESALC, 2020). In the hierarchy of concerns Russian students gave priority to three areas (Ministry of Science and Higher Education, 2020): (1) the replacement of face-to-face classes by online learning which does not encourage self-regulated learning; (2) the immediate effect on students' day-to-day schedule, and financial issues caused by decrease in or loss of income; (3) suspension of out-of-class activities which led to social isolation and lack of communication with peers and teachers.

Suspension of classroom activity at HEIs left students, particularly first-year students and those finishing high school and aspiring to begin tertiary education, in a completely new situation without a clear idea of how long the impact will last. Students have reported that online distance learning was the highest and most serious issue of concern and they had to make an effort to adapt to what for many of them are new formulas for teaching and learning. The situation

has revealed that students have insufficient self-organization, peer interaction, and independent group work skills, which made their experience more complicated. A survey (Ministry of Science and Higher Education, 2020) conducted among Russian students shows that over 40% recognize the lack of communication with their course mates and face-to-face discussions with lecturers as a serious problem, One third of students have experienced anxiety and frustration when the lecturer asks them to turn on a web camera during an on-line class; 35% of students have said that it is difficult for them to ask questions during virtual classes. Over 40% have complained about a significant increase in workload since the proportion of independent studies has grown.

However, in spite of the above-mentioned difficulties, two-thirds of students are satisfied with how online learning is organized at their university. Over 33% of university students prefer online over face-to-face learning since the virtual modality brings in some advantages: they have more time for sleep (64%) and leisure (49%); and they feel less tired (55%).

One of the most serious social challenges for many university students was loss of income. Due to the outbreak and subsequent closure of many businesses, 40% of Russian students reported lower income since many were unable to continue their part-time employment. This prompted the Ministry of Education and Science to launch a National Program that helped to employ 5000 young people. Universities adopted local programs for supporting student employment on campus, for example as IT support staff.

At the beginning of the pandemic over 10% of Russian students had issues accessing effective technology including working laptops and reliable high-speed internet. In the group of low-income families this figure accounted for 30%. The Ministry published a guide with general recommendations to provide support to these groups of students; however, the decision on what forms of the support to choose will be up to the institution. Most universities announced plans to help students with university–owned PCs and in some cases offered financial aid to purchase computers (Ministry of Science and Higher Education, 2020).

Impact on faculty

Although the focus is often placed on the impacts on students, teachers also suffer significant impact at work and professionally. The most evident impact on teachers is the expectation, if not the requirement, that they continue to teach using the virtual mode, while the survey of the faculty staff of leading Russian universities undertaken before the shift to online teaching (Ministry of Science and Higher Education, 2020) shows that teachers have not looked upon distance learning as a compete substitute for a traditional face-to-face mode, since the use of IT incurs some risks, including low student motivation and a threat of de-professionalism of the staff.

The report on the stress test of Russian HEIs identifies four groups of faculty members with regard to their attitude towards online teaching and learning (Ministry of Science and Higher Education, 2020; 16-17).

1. The faculty members teaching subjects which include the development of students' professional competences through practice (clinics, technical sciences, arts - generally all those heavily dependent on practical workshops, laboratory work or institutional practices). This group is not numerous and accounts for 5% of the total teaching staff. They have responded to the change in teaching and learning modality very negatively and argue that many university activities traditional to classical education cannot be moved to online spaces without a significant drop in their effectiveness.

2. Teachers having significant previous experience in using digital technologies (including online courses and resources). These teaching staff members are accustomed to a more or less intensive use of technology in teaching. They make up an average 25% and amount to approximately 40% in leading Russian universities. This group of teachers does not have great difficulty in developing a bank of digital resources and expanding the field of application of the existing communication tools. They believe that an online course can have the same quality as traditional university studies.

3. Teachers having some previous 'digital' experience (such as information search and e-mailing). They can quickly learn how new tools operate, but it requires considerable efforts from them. This group seems to be the largest - 40% on average (up to 50% in leading universities). The abrupt interruption of face-to-face activities has caused too much pressure in terms of the use of different technological tools necessary to ensure that the online learning-teaching process flows effectively. This group reports that they are tired of the growing workload, complexity and pressure of learning new technologies. Teachers in this group do not advocate a significant increase in online education, but do realize that digital platforms and digital resources can supplement the teaching practice. They have developed the so-called Emergency Remote Teaching, or *Coronateaching* which has been defined as the process of "transforming the face to face classes to a virtual mode, but without changing the curriculum or the methodology" (UNESCO-IESALC, 2020; 25)

4. Teachers without any previous experience in distance education. This group may make up from 5% to 30% depending on the university. For these teaching staff the abrupt entry into a complex teaching mode with multiple technological and pedagogical options has resulted in frustration and they feel overwhelmed since they are unable to adapt to a new educational modality due to lack of corresponding digital skills and training. For them the only alternative is to reprogram the face-to-face offer.

Digital pedagogy and quality of Learning

Despite the fact that by and large, Russia's higher education system has managed to successfully reformat its work in the face of the pandemic, it has encountered a range of issues that are yet to be resolved.

The pandemic has raised the question of developing a new pedagogy, Going digital does not only mean to have teachers lecture in front

of a camera; to take the didactic materials from the conventional course and post them onto a university portal, and/or to upload lessons from the internet. It has become clear that HEIs are in need of completely new didactics, completely new ways of sustaining motivation, individualization, interactivity, and student involvement (Crawford et al., 2020).

To be successful, the course needs to foster effective student engagement and be digitally dynamic. This is not possible without appropriate teacher preparation. Such university professors who taught effectively in the face-to-face classroom environment may not find it effective or easy to deliver content digitally. They are likely required to undergo professional development training to rapidly move to online delivery.

The current crisis constitutes a major opportunity for reconsidering what good learning is and for quick curriculum assessment exercises to identify whether there are unnecessary or inappropriate elements in the curriculum that should be redefined, eliminated, replaced or improved. The crisis calls for more intersectoral collaboration between education, health, economy, and other sectors, from a holistic and inclusive perspective (UNESCO, 2020; 4-5).

Although the use of technology in teaching has been implemented in Russia for almost two decades, solely online teaching is new to lecturers and students (Vydrevich&Pervukhina, 2020). In general, most universities regard the online teaching approach as a temporary solution and expect to resume face-to-face teaching after the crisis. Migrating from traditional or blended learning to a fully virtual and online delivery strategy is associated with many challenges (Crawford, 2020; UNESCO-IESALC, 2020), such as the lack of 'home office' infrastructure; the organization of student infrastructure; availability of teachers with the appropriate capacities and skills needed to professionally design online courses; and monitoring of quality assurance, to name just a few.

Becoming especially noticeable was the presence of inequality at various levels: between universities with differing funding and status; between teachers with differing online skills; between students with differing incomes.

Also coming to a head was the issue with infrastructure, above all with hardware and software. The survey of Russian universities has revealed that though 88% of the universities reported the existence of the Learning Management System (LMS) at their disposal, only 45% demonstrated adequate functioning of LMS for conducting classes (Ministry of Science and Higher Education, 2020). To resolve the problem, it was suggested that a countrywide network of consulting and methodological centers be created on the basis of Russian leading regional universities which could develop, store and provide the core software needed to organize universities' new operations. Another strategy is to reinforce the already existing virtual education offices of HEIs, precisely to guarantee better support for teachers and students,

Along with appropriate teacher preparation, in its publications UNESCO (UNESCO, 2020; 3-4) highlights the importance of strong leadership and coordination of efforts at national and local levels. Going digital may trigger teachers, learners and parents feeling overwhelmed and confused. Learners may be flooded with homework that they cannot handle. In addition, many students and their families do not have access to online means – and national and local networks become quickly oversaturated and are slow in responding.

The case of USUE

We have used the case of Ural State University of Economics (USUE) to illustrate how regional universities were and are meeting the challenges posed by the global public health threat. The Ural State University of Economics (USUE) in Ekaterinburg (Russia) has 16 000 students, both full-time and part-time. The pandemic has significantly altered nearly every aspect of university life. On 20 March, 2020, the USUE Rector published a letter on the university website that recommended the suspension of face-to-face teaching and the closure of the university's physical infrastructure for the rest of the term; and the transition to online learning. USUE was one of regional universities to immediately move to remote online teaching, since it had been partially prepared for this endeavour given the

university had some blended offerings (Yablonskaja, 2020, July 2).

USUE is a university with a tradition of virtual education: its virtual platform was created in 2012. It is offered to face-to-face undergraduate and post graduate students as a didactic complement where they can find programs, readings, exercises and, of course, communication mechanisms between students and also with teachers. In general, the degree of intensity of using these platforms in traditional courses always depends on the initiative of the teacher,

Since the beginning of the pandemic more than 1000 on-line groups were created totaling 20 000 participants. USUE launched a portal on infection control and prevention of COVID-19. The Rector's Office was constantly publishing information about their strategy on the university site.

Great effort was put in place to reach all the students; therefore several messages of updates were shared on the USUE website. Students were informed that both lectures and assessment would be delivered in a virtual and online environment. Students that were residing in hostels were required to move out. Due to closure of borders and global travel restrictions imposed by many countries, the international students enrolled at the university (1250 in number at that moment) were allowed to stay on campus. Overseas placements including exchange programs and international projects on staff mobility were also suspended. Affected students who could not return from their overseas placements were advised to stay in contact with their in-country contacts for further support and potential evaluation. They were able to return home only in late June - early July.

By 20 March, 2020 the university aimed to have only 25% of staff working on campus, with a further reduction to no more than 10% of officials by 23 March. The only events allowed to take place were committees and other meetings necessary for the operation of the university with video conferencing technology being strongly preferred over face-to-face meetings.

Bans on large gatherings on campus forced USUE to postpone some public events. Although graduation ceremonies for bachelor

and master students scheduled for mid-May had to be cancelled, graduates still received their awards in a timely fashion.

Finally, the evolving situation of COVID-19 led to updating teaching arrangements. Workshops, laboratory work, and practicums were all suspended. Other learning activities and examinations were delivered to students online via Microsoft Teams. The teaching staff was recommended to use assessment based on cumulative grades students received during online classes.

Though USUE had a pursued blended learning approach prior to COVID-19, not all teachers and lecturers were prepared for the transition. The university took steps to provide relevant online teaching training to staff members during the period of campus closure. The university created video and teaching guides and conducted online workshops to equip staff and students with various modes of e-learning and skills of using the online learning platform. The training content was developed by the information technology team of the university. E-learning was offered using Microsoft Teams.

New academic year: How oziliit works

The new 2020/2021 academic year for all Russian universities started with no delay although significant uncertainty continued. On 28 August, 2020 in his beginning-of-the-academic-year speech, the USUE Rector acknowledged the impressive effort and dedication of all the academics, staff and administration.

The current COVID-19 climate has affected the type of teaching and learning modality in Russian HEIs in the new academic year. Following the recommendations of the Ministry, universities may choose the approach which falls into one of the two categories.

1. Moving to Online-Only Instruction: According to Valery Falkov, the Head of the Ministry of Higher Education and Science of the Russian Federation, of 1278 Russian universities, 152 universities are operating online only during the winter semester (Yablonskaja, 2020, October 28).

2. Creating a Hybrid Model: the rest of the universities are using a blend of in-person and online learning. USUE is continuing to offer face-to-face tutorials with alternative online instruction delivery structures for large lectures. In September and October 2020, traditional face-to-face mode was offered to college students, first-year bachelor-degree students and master students. The type of modality changed in November: second and third-year students who studied online in September and October shifted to in-person learning, while other categories of students moved to virtual classes. The end of year exams for this academic year may be held in a traditional mode: since the epidemic climate in USUE is not threatening, University management does not consider a move to online-only instruction as a necessary measure.

Conclusion

In a matter of weeks, the coronavirus has changed how students are educated around the world. The impact on the academic higher education system with its conservative, centuries-old, lecture-based approaches to teaching has been unprecedented. COVID-19 has become a catalyst for educational institutions worldwide to search for innovative solutions in a relatively short period of time.

It remains to be seen how the quality of learning will be affected by the shift from face-to-face to online teaching. The 2020/2021 academic year will definitely be a blend of e-learning and face-to-face modality, and it will require more effort by both HEIs and students and a close dialogue between them in order to provide a meaningful learning experience.

The pandemic has provided a better understanding of our current education systems' vulnerabilities and shortcomings. COVID-19 is causing educators to challenge deep-rooted notions of when, where, and how education is delivered, of the role of HEIs, the importance of lifelong learning, and the distinction between traditional and non-traditional learners (Kandri, 2020).

'What has the pandemic taught us?' asks Justin Reich in his new book *Failure to Disrupt: Why Technology Alone Can't Transform*

Education (2020). Transition to massive online education shows that there are no easy solutions or one-size-fits-all tools. Educators need to understand what can be learned better online and what could be left for personal learning. An emerging challenge to start thinking and planning for the after-crisis period when schools will resume should be included in today's agendas of governments, ministries and university management (UNESCO, 2020).

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Chapter 3

Upasana Singh, Chenicheri Sid Nair and Rashmi Watson

The transformation in Higher Education in Australia during the COVID-19 pandemic

Background

The disruption caused by the COVID-19 pandemic on higher education is not only confined to the shores of Australia but is a worldwide phenomenon. The effects of the pandemic have been wide including closures of schools and institutions of higher education worldwide. UNESCO reports that over 1.3 billion learners were or still are affected by the closure of educational institutions (UNESCO, 2021).

This worldwide phenomenon raises several questions in terms of the adaptability of the higher education sector and the readiness of the sector that had to act fast as this crisis worsened. The sudden changes have influenced not only the way education is delivered but has had, pedagogical readiness of academics both in design and delivery of lectures as well as the technological readiness of institutions to rise to this change. In addition, technological readiness in rural areas, especially in lower-income countries poses a greater challenge during

this period especially in terms of access to appropriate computers and digital bands. Prior to the pandemic the higher education sector in general utilized a face-to-face teaching approach on the premise that there is greater engagement of students with their peers when physically present on a campus.

Many skills are required by academic teaching staff when teaching online such as managing instructional time and space and virtual active pedagogical techniques through virtual communication channels (Easton, 2003) such as Learning Management Systems (LMS'), Zoom or other online audio/video conferencing tools.

Research problem

This immediate and dynamic change is unparalleled in the academic literature where academic staff were 'forced' to adapt to the digital age almost immediately so as to ensure millions of students worldwide would be able to continue with their studies. Most higher education institutions had plans to strengthen their digital footprint in the next decade or so. With this change, this paper looks at the perception of academics and the effects of the disruption for the Australian higher education perspective with the following aims: To understand academics' preferences of technology adoption methods prior to and during the COVID-19 pandemic, to support online teaching and assessment; identify what quality assurance measures are place during the sudden shift to online teaching and assessment; and in, investigate the general impact of the pandemic on academics.

Literature review

Since the outbreak of the pandemic, higher education was forced into rapid adaptation to online learning to meet the sudden impact on learning delivery. A shift to online teaching and learning by academic staff and students required academics to make the move to online delivery quickly but also required students to embrace the online mode and all that it offered. Literature shows that the challenges for students were not based on technical or operational aspects but rather on their own attitude and mindset towards

online learning including being self-disciplined and working in a positive learning environment from home during the self-isolation period (Bao, 2020). The literature leaves no doubt that the higher education sector must change and adapt to technologies which are difficult and expensive (Glasby, 2015); the pandemic caused an immediate need and increased cost to many universities to adopt and adapt to technologies.

Not only did the institutions as a whole face challenges but academics who are at the forefront had to adopt and adapt digital delivery as the primary mode of delivery. Challenges for higher education academics included pedagogical adoption of technologies which have moved slowly in recent years or with no effect on student learning due to the gap in understanding the effect on student learning (Blewett, 2016). Many universities did not have online capabilities, resources or academic capacity to transition to the sudden online delivery. Few higher education institutions offered online delivery prior to COVID-19, and many were not prepared for the transition (Archibald et al., 2019; Leung & Sharma, 2020). Research shows students' responses to online learning as very similar figures for students who have studied online (around 30-35%) in terms of: enjoyed online learning less, enjoyed online learning about the same as a traditional classroom; and enjoyed online learning more (Muilenburg & Berge, 2005). Research on learner performance improvement shows that the instructor's design efforts and the amount of time spent studying are what make a difference rather than simply the technology itself (Oliver et al., 2014).

Whilst the rapid introduction and immersion into digital technologies during the pandemic may have forced Higher Education academics to take up its use in their newly adopted teaching formats, the issue of quality assurance (QA) processes must be considered in the overall approach. The term findability (the degree to which …a system or environment supports navigation and retrieval) has been found to be paramount for online students. Findability has been singled out as the most significant predictor of self-efficacy and motivation in online courses (Crews, Bordonada & Wilkinson, 2017). During the COVID-19 period, academics have been forced to adapt assessment-related practices to either cancelling, altering

or adapting. In a report by Janowski (2020), it was reported that 97 percent of research respondents made changes to assessments of some kind. Bradford (2011) found that awareness, challenge and engagement were key factors in student motivation in online learning. In the engagement factor, students liked active learning communication strategies with positive feedback offered back to students as being an important element of student engagement.

A meta-analysis of comparative research reported that, on average, students in the online mode performed modestly better than those receiving face-to-face instruction and that a blended approach also included additional learning and pedagogical aspects not received by students in a face-to-face mode (Oliver et al., 2014).This research highlights the high level of effort required by academics to ensure quality online pedagogy which the rapid changeover in practice may not have allowed in most higher education institutions in such a short period of adaptation. Quality assurance (QA) procedures are critical in the adoption of online pedagogies. The Pandemic speed may or may not have allowed adequate time across all Higher Education Institutions (HEIs) to have these QA processes in place to the highest level. Mishra and Koehler (2006) developed a TPACK Framework which focuses on educators' need to have knowledge in technology, pedagogy and content. The framework provides HEIs with one approach to integrating a digital technology implementation QA processes (perhaps post Pandemic) if required as it combines knowledge such as technological pedagogical knowledge (TPK) which describe the relationships and interactions between technological tools and specific pedagogical practices. The research also highlights insufficient pedagogical knowledge by staff in designing and online learning (Englund et al., 2017; Blin & Munro, 2008). The flow-on effects of poor pedagogical practice can lead to a lack of student engagement resulting in passive learning. Kirwood and Price (2012) emphasised the ways in which academics conceptualise teaching and learning when using technology have impactful and interrelated significance on their students' experiences.

When teaching, learning and assessment practices are completed offsite, online or remotely, the academic integrity of ensuring processes becomes problematic unless a secure and robust process

or tool is put in place. Such tools have emerged to allow remote e-monitoring through audio and video surveillance. ProctorU is one of the most common Proctoring systems currently (González-González et al., 2020). Other online teaching and assessment tools include email, Zoom, live video conferencing through Learning Management Systems (LMSs). None of these besides exam proctoring services can provide a guarantee of full academic integrity. However, the literature highlights that universities determine their decisions based on quality management, external conditioning, trust, perceived compatibility, perceived usefulness, attitude and intention with trust (through degree of security and privacy that institutions have in the use of the tool) being seen as the highest decisive factor (Gonzalez-Gonzalez, Infante-Moro & Infante-Moro, 2020).

During the current pandemic, Zoom was extensively used as a method of synchronous, web-based conferencing (Easton, 2003). Archibald, Ambagtsheer, Casey, & Lawless (2019) identified the key advantages of using Zoom as rapport, convenience, and simplicity and user-friendliness. By the end of March 2019, the online platform Zoom had reached 200 million users per day (up 1, 900%), (Valet, 2020).

Research methodology

The current research forms part of a broader study on the impact of the COVID-19 pandemic on academics at Higher Education Institutions. Ethics approval was received from the University of KwaZulu-Natal, South Africa as per Protocol Reference Number HSSREC/00001284/2020. While the focus of this study was on higher education academics in Australia ethics approval was received from both South Africa and Australia as part of the initial, joint collaborative research. An online survey tool through Google docs was developed to gather primary data. The survey was disseminated via a number of methods including: direct email invitation to academic staff from within the universities/institutions, postings on academic forums such as the Higher Educational Research Society for Australia (HERDSA) mailing list and on researchers' own LinkedIn posts. Thus, the random sampling method was adopted.

The methodology used a mixed-method approach gathering both qualitative and quantitative methods. Quantitative data was gathered to analyse usage and adoption of technology for teaching, and assessment, prior to and during the pandemic; and open-ended questions to capture academics' perceptions, feedback and experiences with the transition to online teaching and assessment. A total of 36 questions were asked with 11 on demographic data, 16 requiring a rating on a likert scale, and 9 open-ended responses. Data collection was open for a period of 6 weeks. The online survey took approximately 15 minutes to complete and was anonymous; only demographic data was collected identifying the university, role and years of experience. The final sample was 71 academics across 12 Australian universities/tertiary institutions. Since the invitation to participate was shared on an Australian based mailing list for academics in HEIs, there were no specific selection criteria used to target selected Universities – it was an open invitation to participate, to both private and public HEI in Australia. Quantitative data were analysed using statistical analysis using SPSS. Tests used in the analysis include: Descriptive statistics through means and standard deviations; frequencies represented in tables or graphs; Chi-square goodness-of-fit-test; Chi-square test of independence; Fisher's exact test; Binomial test; and One sample t-test which tests whether a mean score is significantly different from a scalar value. Qualitative data were analysed using thematic analysis and summarised using word cloud representations.

Discussion of findings

A total of 71 valid responses were received in this study from both public (71,9%) and private (28,1%) institutions. Table 1 summarises the demographic distribution of the respondents. The majority of the participants (59,2%) were from the ages of 41 to 60. Females (63,4%) dominated the study. Almost all respondents (97,2%) had a postgraduate degree. In terms of academic hierarchy, lecturers (40,8%) held the highest participation rate, with 43,7% of participants having experience in academia for more than 16 years. The majority (57,7%) had permanent tenure.

Table 1. Demographics summary

Variable/Category	Frequency (Percent)
Age:	
20-30	4 (5.6%)
31-40	12 (16.9%)
41-50	20 (28.2%)
51-60	22 (31.0%)
Gender:	
Female	45 (63.4%)
Male	24 (33.8%)
Prefer not to say	2 (2.8%)
Qualification:	
Undergraduate	1 (2.8%)
Graduate	69 (97.2%)
Experience:	
1-5 years	13 (18.3%)
6-10 years	12 (16.9%)
11-15 years	15 (21.1%)
16+ years	31 (43.7%)
Institution Type:	
Private	20 (28.1%)
Public	51 (71.9%)
Tenure:	
Permanent	41 (57.7%)
Contract	30 (42.3%)
Academic role:	
Tutor	4 (5.6%)
Lecturer	29 (40.8%)
Senior Lecturer	17 (23.9%)
Associate Professor	14 (19.7%)
Professor	6 (8.5%)
Other	1 (1.4%)

To determine the impact that the COVID-19 pandemic had on the primary teaching method, the next question focused on the three dominant types, that is contact based (face-to-face), online learning (no face-to-face) and blended learning. As depicted in Figure 1 there was a clear shift from face-to-face learning (87,3%) and blended learning (33,8%) prior to the COVID-19 pandemic, to online learning (91,5%) during the pandemic. This was a direct result of the high risk of transmission of the pandemic; the more an individual interacts with others and the longer the interaction, the higher the risk of the COVID-19 spread (Centers for Disease Control and Prevention, 2020). This digital delivery in Australia supports earlier findings in other studies of the change of delivery modes to digital delivery (Archibald et al., 2019; Leung & Sharma, 2020).

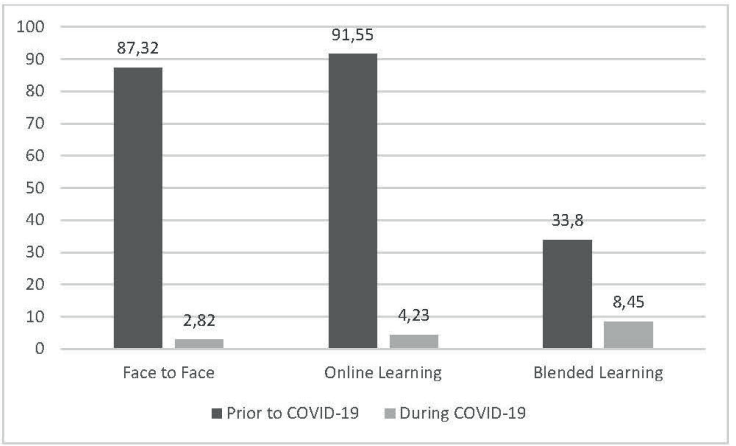

Figure 1. Primary teaching method

While the primary aim of this study did not seek to compare the results from private and public Australian HEIs, significant results across these two types of institutions are reported. Results from a Fisher's exact test revealed that there is a significant relationship between the type of institution and the use of a blended approach prior to and during the pandemic ($p<.0005$). A significant proportion of the private institutions did not use a blended approach ($p<.0005$);

while a significant proportion of public institutions adopted a blended approach prior to the pandemic ($p<.0005$). As Oliver et al (2014) showed in their research, a high level of effort is required by academics in the design of online teaching rather than simply transforming teaching over to digital technologies if real difference to learner achievement is to be made. The results also suggest that private institutions may have been less prepared for this rapid change.

The first section in the questionnaire focused on understanding the difference in technology adoption methods prior to and during the COVID-19 pandemic. The importance to gauge the academics' proficiency in adopting technology to support online teaching and online assessment has been clearly demonstrated in previous research work which reported the intricacies of digital delivery (Oliver et al., 2014; Englund et al., 2017; Blin & Munro, 2008).

Respondents rated their proficiency in adopting both online teaching methods and online assessment methods using the scale from 1 = poor to 5 = excellent. A one-sample t-test was applied to test if the average proficiency rating was significantly above or below an average rating of '3'. Results showed that proficiency ratings were significantly above average for both teaching methods (mean rating = 4.15, $p<.0005$) and assessment methods (mean rating = 3.85, $p<.0005$). This suggests that the respondents rated themselves as better than average, tending towards excellent, in their proficiency in adopting technology for both teaching and assessment. This finding suggests a technology ready academic work force in Australia which is different from other research findings which indicate many academics were not adequately prepared for the transition (Archibald et al., 2019; Leung & Sharma, 2020).

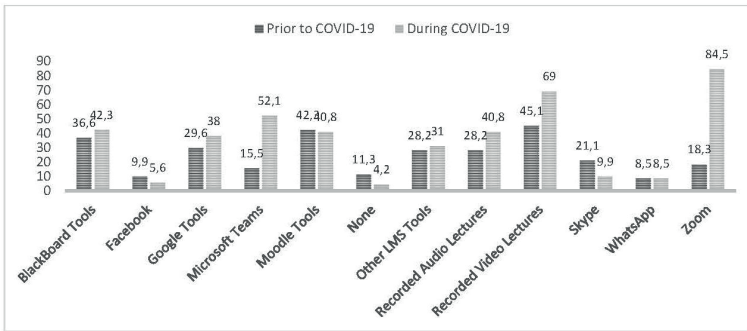

Figure 2. Teaching tools adoption summary

Figure 2 summarises the tools that were identified by the respondents to support the online teaching, prior to and during the pandemic. The top 5 teaching tools adopted prior to the pandemic were Recorded video lectures (45,1%), Moodle Tools (42,3%), BlackBoard Tools (36,6%), Google Tools (29,6%), and Recorded Audio Lectures (28,2%); while, during the pandemic, Zoom topped the list (85,5%), followed by Recorded Video Lectures (69%), Microsoft Teams (52,1%), BlackBoard Tools (42,3%) and Moodle Tools (40,8%). This finding in Australian academia supports the findings of Archibald, Ambagtsheer, Casey, & Lawless (2019) and Valet (2020) where Zoom dominated the academic arena in online delivery.

A Binomial test was conducted to identify if a significant proportion of the sample responded Yes or No to usage of each of these tools prior to or during the pandemic. Results suggest that the only tools significantly selected for use were Zoom (85%, $p<.0005$) and Recorded video lectures (69%, $p=.002$).

Other Tools adopted to support their online teaching included MS Whiteboard, Kahoot, Padlet, Mentimeter, Slido, Thinglink, Dropbox, Polling, and YouTube private videos (Bennet et al, 2008).

In order to assess if there is a relationship between the type of institution (public or private) and the usage of these teaching tools, Pearson's Chi-square test was used. Results showed that a significant number of private institutions used Moodle for teaching both prior

to and during the pandemic, p<.0005 in both cases.

In terms of assessment tools that respondents adopted to support online assessment, prior to and during the pandemic, Figure 3 suggests that no single digital tool or approach was utilized though Zoom once again dominated the online scene. This finding suggests that academics in Australia were able to adapt their assessment with a variety of tools to deliver a much richer online environment. The same can be applied to an entire cohort of students and students also need to learn how to best utilise the technologies when working online (Bennett et al., 2008). The rapid changes in the pedagogical approach, again may not have equipped all students in time to manage this at the most effective and efficient level.

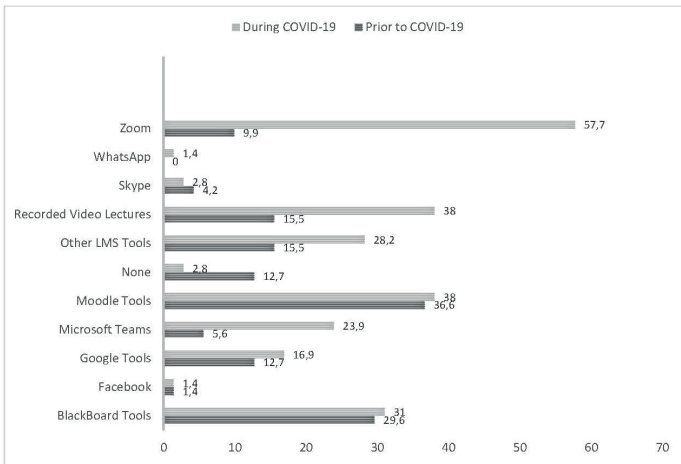

Figure 3. Assessment tools adoption summary

As illustrated in Figure 3, the top 5 assessment tools adopted prior to the pandemic were Moodle Tools (36,6%), BlackBoard Tools (29,6%), Recorded video lectures (15,5%), Google Tools (15,5%), and Other LMS Tools (12,7%). During the pandemic Zoom topped the list (57,7%), followed by Recorded Video Lectures (38%), Moodle Tools (38%), BlackBoard Tools (31%) and Other LMS Tools (28,2%). Other tools adopted for online assessment included MS Whiteboard, Kahoot, MS Word Fill in Forms, Zoom: Performance assessment, Respondus, Screencasto, Examplify,

Webex, and Padlet. Analysis indicated no significant usage of any of these assessment tools prior to or during the pandemic; in addition, there was no significant difference in adoption of any of these tools between public and private institutions.

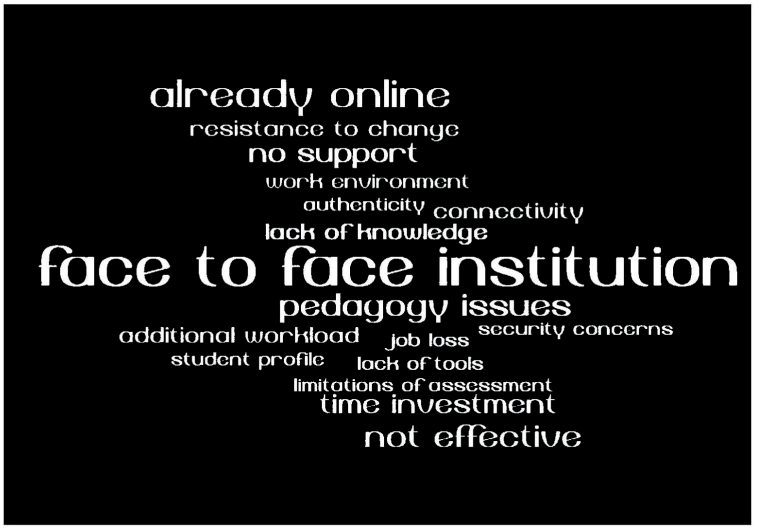

Figure 4. Word Cloud summarising the factors inhibiting online teaching and assessment adoption prior to the pandemic

The study engaged further with the respondents in terms of qualitative feedback on the factors that prevented them from adopting online teaching and assessment prior to the COVID-19 pandemic. A summary of the themes that emerged from the qualitative responses received are summarised in the word cloud, Figure 4. The most prominent factor was that their institutions are "face-to-face institutions" by definition. Thus, there are "university policy and government legislation" (Respondent 19) that had to be followed e.g. "International students on student visas can only study online for one third of the total program" (Respondent 2). Specifically where there are large classes, courses are designed for a face-to-face environment, "to encourage community and collegiality...large number of students (>400) ... online sessions lack intimacy, the content is challenging - which means it is

important to have direct access to an instructor. It would be very easy to disengage in an online environment in these circumstances. Engagement is the key to student success," Respondent 62. This feedback supports the work of Oliver et al (2004) which suggest that Learning Management Systems such as Blackboard and Moodle, can be designed to inculcate students into what is referred to as "transmissive" pedagogies that do not necessarily allow for creativity, critical thinking and social interactivity.

This response led to the next factors of online teaching being "not effective" and its related "pedagogy issues". A number of respondents echoed a similar sentiment in terms of online pedagogy being less effective. Some of these sentiments were

> "students tend to ignore the resources (online), and prefer to seek individual one-on-one personal interactions" (Respondent 63).
>
> "in-person methods are more effective" (Respondent 20).
>
> "still keener on the value of personal interactions and team work face-to-face" (Respondent 33)
>
> Apart from online pedagogy ineffectiveness a number of respondents suggested that online teaching is not always suited pedagogically to the type of module being taught:
>
> "I teach classes with external clients and real design briefs and sites, so they are very hands on and face to face." (Respondent 70)
>
> "for what and how I teach, ..., in person teaching is superior because it facilitates better interaction between students." (Respondent 50)
>
> "Practically related courses are difficult to move to the online environment ".. to teach clinical skills which requires demonstration and practice on others , including patient volunteers." (Respondent 58)

Another theme that came out from the academics was their preference of returning to the norm, that being face-to-face. Respondent 24 added that there is "too much hype about technology that does not match the reality, especially in large classes." This was reiterated by

Respondent 69, who stated that online learning is "... not as much fun! I prefer the face to face interaction and I think students learn better when they are physically present". Respondent 64 added "I had lots of online activities and resources as the university encourages a blended approach. However, I have a very active, student-centred teaching style that is difficult to translate directly to an online mode. I also prefer to be able to see the students and feel the "vibe" of the room to gauge if they are following along with the learning. It is important to see their faces and body language. Also, I provide group activities so that they can help each other with their learning."

A theme that was supported by a number of respondents was the "resistance to change": Respondent 24 was supported by Respondent 44 saying “resistance from other staff” is a barrier to the shift to online teaching. Respondent 8 added "...there was resistance from my team. I was leading with small videos prior to COVID 19, now they are becoming more natural with acceptance from the team."

A good number had no difficulty with the online pedagogy. At least 8 participants were already adopting an online mode prior to COVID-19, and as Respondent 68 explained, it was seen to be a success "...I employ a flipped classroom model where students do prep work prior to comping to 6 x 2 hour compulsory on-campus workshops (so no traditional lectures and tutorials are used). Respondent 63 added "My teaching was mostly online...In a former role at another university I was programme leader for a Masters in Blended and Online Education and prior to that I taught biology in large classes (800-1300 students) in Scotland and New Zealand." Respondent 22 stated “I am finding students are missing face-to-face greatly, it often comes up during lessons. I have worked hard to create interactive classes eg: breakouts, use of interactive tools, but they miss the body-language and face-to-face atmosphere they tell me"

The workshops are highly interactive and it's difficult to translate these into an on-line modality (e.g., Zoom with small break rooms)."

One theme that was apparent was additional workload and time investment required to move to the online environment was prohibitive for some academics. Comments for this theme included

"online teaching is a new challenge for both students and teachers" which requires additional (Respondent 57)

"workload and time investment" (Respondents 34 and 35).

Technical issues such as lack of connectivity was also a recurrent theme:

"insufficient internet connection," (Respondent 41)

"restricted access to connectivity," (Respondent 46)

"slow internet," (Respondent 47)

Lack of online tools was another theme raised as explained by Respondent 8 "some tools were not available." Respondent 51 outlined additional related issues such as "poor tools, and academic misconduct with existing tools."

Lack of knowledge of the tools, their implementation, and related support, in the online environment was also discussed by some respondents - "I regularly incorporate ICTs in my teaching, but… sometimes even staff are unaware of the systems (ie when I need support)" (Respondent 65). "Technology (in)competence" and "support of devices" were outlined by Respondents 26 and 21 respectively.

An important factor highlighted by Respondent 14 focused on the student profile within the classes -

"not all students are capable of learning online, approx 80% or our students fall into that category." The Respondent reiterated this by stating that "...students generally have low level tech literacy beyond their usual social media platforms." (Respondent 65)

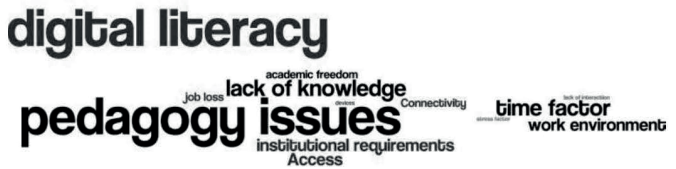

Figure 5. Word Cloud summarising challenges in adopting online delivery

Further enquiry revealed the challenges academics are facing with adopting online teaching and assessment during the COVID-19 pandemic. A summary of the themes that emerged from the quantitative responses received to this aspect are summarised in the word cloud, Figure 5.

With the "forced" move "I have fully embraced online teaching and assessment because it has been a direction of the university",

Digital issues were highlighted by a number of respondents - Respondent 64 speaking about online teaching and assessment during the pandemic noted that the biggest challenge academics indicated is that of inadequate digital literacy. Respondent 52 stated "my computer skills were a barrier but I am now forced to learn and am adapting". In addition Respondent 65 shared how he was assisting fellow colleagues to become digitally literate as institutions may not have adequate support staff "...I'm aware of the tools, I've been using some of the tools already. I'm good at tech I think, I'm teaching other faculty members how to use Zoom or Blackboard - hours, actually! There is one support person for our university (1400+ staff!)". Other comments suggested that digital literacy amongst students is also a challenge - "confusion from students who are navigating many rapid changes at once", Respondent 51, and "not easy to explain (the online environment) to the students", Respondent 58. Respondent 44 indicated a lack of “familiarity with programs being used”. Student access, connectivity and devices were also areas of concern as outlined by Repondent 46 - "majority of the students live in the restricted access to connectivity areas... students' access to devices is very limited". Access and connectivity

for academics were also outlined - "internet drops off, we don't have fiber", Respondents 47 and 44. Time and stress factors were outlined by Respondent 6 "I have to do it quickly2, "time for students and staff to learn and adapt", Respondent 15, "tools are time consuming, complex and in many cases inflexible. Moodle and Turnitin in particular are proving to be major sources of frustration", Respondent 63.

Pedagogical issues indicate that online assessment is not deemed as suitable for certain modules: "online assessment is very difficult in Mathematics and Statistics", Respondent 40; "need to teach clinical skills which requires demonstration and practice on others", Respondent 58. Others expressed concern at not knowing which online teaching and assessment methods were appropriate - "knowing what works best", Respondent 59.

The challenges of equity and access were highlighted by Respondent 68 who states,

> "I have been utilising some on-line practices but reverting to a more traditional format where I record a lecture and set activities for them to do and submit via LMS. I'm not attempting to run workshops in real-time as there can be equity and access issues as not all students have stable internet and devices etc. Furthermore, living/working in a shared house has presented problems for students too in terms of finding a quiet place to work. I do offer some regular Zoom "drop-ins" for students to attend where we can share info, ask questions etc."

Second, lack of knowledge of implementation of online teaching and assessment was outlined by Respondent 51 "we have adopted online teaching and assessment without prior knowledge... we can't be sure they are being well received by the students, but we are doing what we can to try and maintain engagement".

It is evident from this study that professional development needs remain an important factor in the development needs of academic staff such as alternative assessment examples, best practice for online assessment. This need for professional development is supported by other studies Janowski, (2020). Further, the results

of this study suggest that both a combination of regular and timely communication between higher education staff and students, along with interactive and active engaging course design, online students can be more effectively engaged, supported and encouraged to persist within the online learning environment (Stone & Springer, 2019).

Communicating with students

When academics rated their proficiency in communicating with their students on an online learning platform during the pandemic on a scale from 1 = very difficult to 5 = very easy, no significant results were noted. From Figure 6 it is noted that after "Access to connectivity" (57,7%), the major challenges students were facing were the social and emotional factors - "Lack of interaction" (56,3%), "Demotivation" (38%) and "Fear of the unknown" (35,2%). This was followed by the technological factors – "Access to devices"(33,8%), "Technology competence" (33,8%) and "Resistance to change"(23,9%).

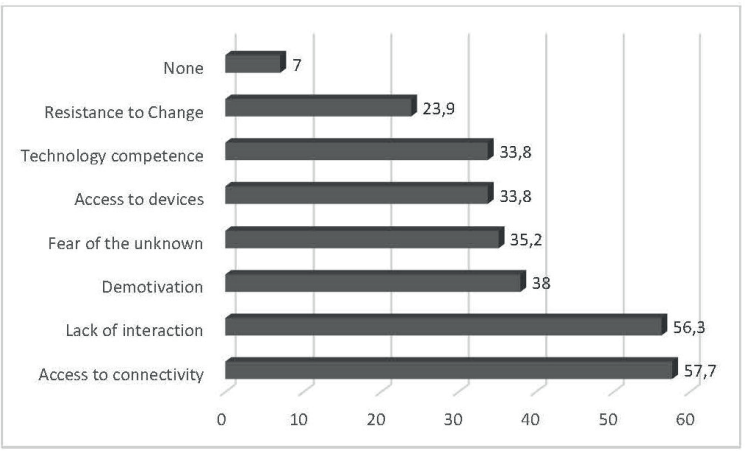

Figure 6. Perception of challenges faced by students in moving online

Analysis shows that none of these hurdles was selected by a significant proportion of the respondents. The top five methods

which were adopted by academics to support their students during the pandemic are illustrated in Figure 7. These are "Online lectures" (92%), "Direct Emails" (90%), "Online tutorials" (87%), "Online assessment" (87%) and "Emails through LMS" (70%). These were all indicated by a significant proportion of the respondents as ways they supported their students (p<.0005 in each case).

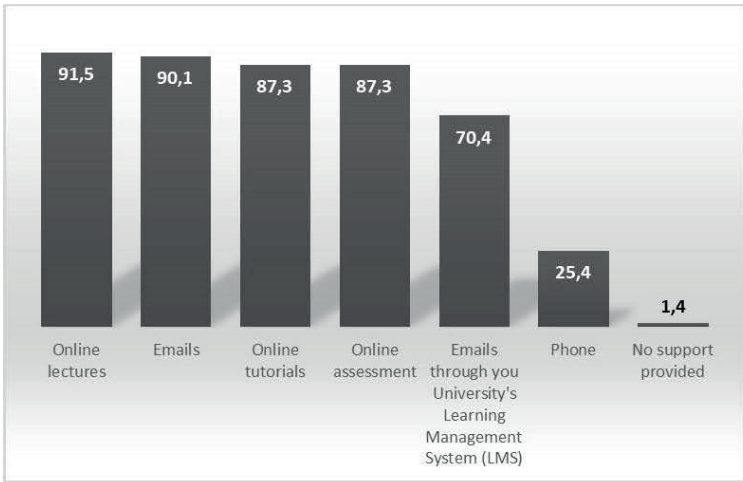

Figure 7. Methods to support students during the pandemic

When rating the responsiveness of their students to the support, on a scale from 1 = unresponsive to 5 = very responsive, the mean rating was 3.83 which is significantly higher than the central score of "3" (p<.0005), indicating that they were more responsive than average. In the same way, the mean rating of the effectiveness of working with students online when using a scale of 1 = not at all effective to 5 = very effective was 3.65 which is also significantly higher than the average score of '3, indicating better than average effectiveness, p<.0005. There was no significant indication that they would continue with online learning post the pandemic.

Quality assurance

The study further investigated the quality assurance (QA) procedures that were adopted prior to and during the pandemic. The same

top three QA procedures, as presented in Figure 8, were used by a significant proportion of the respondents both prior to and during the pandemic. These included 'Provide training in the adoption of tools of LMS', "Student feedback on delivery" and "Provide technical support". Supporting this are the comments from an academic "we are now preparing for next semester... I can intentionally design the elements I want to see especially around getting better collaboration between students. Understanding how to do this online better is currently my biggest concern." (Respondent 62). This finding adds to the literature evidence that quality assurance procedures are paramount to effective online delivery (Crews, Bordonada and Wilkinson, 2017).

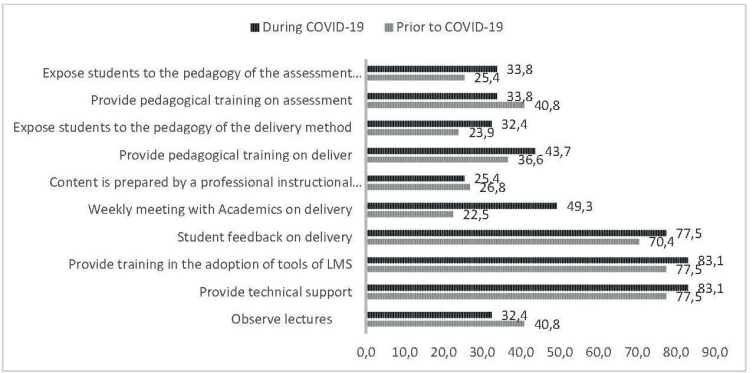

Figure 8. Institutional Quality Assurance Procedures

Impact of COVID-19 on the institution

When academics were asked to rate their concern over the Impact of COVID-19 on the academic calendar (from 1 = not at all worried to 5 = very worried) , the mean rating was found to be 3.45, which was significantly higher than the central rating score of "3", $p<.0005$, thus suggesting that academics at Australian HEIs are worried about the impact of COVID-19 on their Institution's academic calendar.

Further analysis showed that a significant number of respondents (n=45, 63%) perceive that their Institution will adopt blended learning post the pandemic, as shown in Figure 9. In moving forward, it is important that higher education institutions support

staff appropriately for online teaching with quality professional development, resourcing and technical support and at the institutional level with leadership, infrastructure and evaluation (Parsell, 2014).

One other factor that was highlighted was job security as some academics who took part in this study were losing their jobs due to the pandemic and the move to a different teaching model: "job was terminated," (Respondent 13) and they "have been made redundant due to loss of university funding" (Respondent 68).

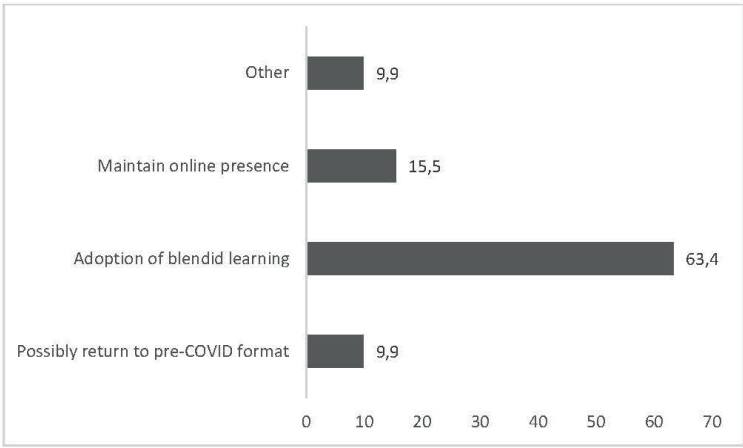

Figure 9. Future shape of Institution

Conclusion

The results of this study indicate that during the pandemic there was a significant decrease in the adoption of face-to-face and blended learning at Australian HEIs. Online learning increased drastically during this period. It was encouraging to note that academics found themselves proficient in their ability to adopt technology to support online teaching, learning and assessment. Corresponding with the higher rate of adoption of online learning during the pandemic, live online lectures were predominant. Interestingly, the adoption and use of the LMS for teaching and learning remained fairly consistent prior to and during the pandemic. The LMS was used less for assessment during the pandemic than prior to the

pandemic. Reasons cited for the non-adoption of online teaching and assessment prior to the COVID-19 pandemic covered digital literacy, for both academics and students; inadequate understanding of digital pedagogy; lack of knowledge of online tools to support teaching and assessment in the online environment; access and connectivity problems, for both academics and students; time factor, especially being rushed in the pandemic situation to make the shift to online; and work-from-home related concerns. Additional factors included: that many institutions are primarily face-to-face HEIs, online pedagogy not matching their specific course content and/or objectives, resistance to change, online learning ineffective for their course content, additional workload and time investment to move online not justified, no support provided by the HEI, and lack of knowledge and tools to facilitate online teaching and assessment. Challenges highlighted by academics during the "forced" move to online teaching and assessment include factors that affected students' ability to engage online included lack of access to connectivity, social and emotional factors like lack of interactivity and fear, as well as technological factors. The most effective tools adopted for communication with students were found to be communication during the live online sessions, and emails. Australian students were responsive to communication from their lecturers. Despite the seemingly effective adoption of online learning, there was no significant indication that academics would want to continue with online learning post the pandemic. The trend suggests that blended learning would probably be the norm post the pandemic.

The most prominent QA measures adopted to support teaching and assessment prior to and during the pandemic included training in the adoption of tools of LMS, student feedback on delivery, and the provision of general technical support. This study has a number of implications for the higher education sector, namely falling in two broad areas, policy and capacity building. The need for these two main areas are supported in the literature which suggest that the higher education sector must change and adapt to cater for the needs of their students (Glasby, 2015). First and foremost the study suggests that academics learnt by themselves how to use online tools to support their students. This, though encouraging, suggests a need

for systemic capacity building for academic staff in the effective use of online tools to further enhance the student online experience. This importance of capacity building is further reinforced as the study suggests that a complete online teaching delivery would not be the accepted norm by academics, though there is a realisation from the pandemic the online environment is here to stay and will play a greater role in the delivery of courses in the higher education sector. Thus, the development of the Academic SkillSET (Singh, 2020) for the online space is essential.

Second, health considerations are seen to be a critical factor for employers to be aware when staff are working at home. Academic staff feedback suggests that there is a general lack of support for the teaching staff in terms of their ability to engage with their fellow colleagues. This suggests that there is a need for universities to put in place a plan to engage their staff on a regular basis which could include regular meetings to keep staff in the loop - such actions can be in the form of online staff meetings to discuss teaching and learning matters and to provide counselling support to staff to handle the isolation.

Third, an important and critical matter is the need to resource the online environment with the proper infrastructure to handle the influx of students in the digital environment at each institution. Simply put to accelerate the plans to have a totally digital ready delivery environment. Overall, all matters arising from this study point to a need for an umbrella policy which include a continuity education plan to handle what can be termed as unplanned changes in the delivery mode. Such plans include the identification of appropriate online tools based on the specificity oof the discipline which are a necessity so that students are not disadvantaged to complete their studies when and if such a situation arises again. Such continuity plans have to also consider the need of academic staff as well as of the students on how they transit from one phase of learning to a completely digital world of learning.

Limitations

Data was collected during the initial stages of the lockdown in Australia (May-June, 2020). This was a busy period for academics, having to transition into a fully online environment, in an attempt to ensure continuity of academic activities. Hence, despite numerous requests and extensions for participation, the response rate was low. This means that while the results may prove interesting, and provide an insight during the pandemic, they cannot be projected onto the general academic population due to the low sample size.

Future research

The body of literature on the impact of COVID-19 on Higher Education Institutions is still developing. Future research could focus on the lived experiences of Australian academics in the transition to the online environment and its sustainability post the lockdowns, adapting assessments in future courses based on learning from this present crisis and lessons from working from home. It would be beneficial to investigate the impact of the transition to the online environment on Australian students, as well as Administrative and Support staff at Australian HEIs.

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Chapter 4

José Joaquim Marques da Costa

Multimedia learning and internet resources in pandemic times

The COVID-19 regulations forced many teachers and students to jump from face-to-face teaching to a "suddenly eLearning" context (Sonja, 2020, p. 198). This situation has increased the need to produce high-quality audio-visual documents for learning support.

Teachers have two main ways of dealing with the difficulty of creating and presenting a large number of digital documents to their students. They can adapt materials that they already have or produce new ones by searching on the internet. Either way, using resources available on the internet can be helpful because they increase the creativity and interest in multimedia documents created to deal with the novelty required by reduced physical interaction situations.

This chapter offers some suggestions about the kind of resources and locations that can be useful to create e learning documents. It begins by a brief approach of psi-educational aspects in pandemic times and reviewing the mains principles of multimedia learning. Afterwards, a brief description of multimedia materials' copyright issues is presented followed by a description of image and sound

edition, including lists of websites on both materials. Finally, a list of websites that offer different online courses is also provided.

1. Education in pandemic times

The Covid-19 pandemic and the successive periods of lockdown have had a significant impact on the learning environment for students, teachers, and family life. Data has shown that the uncertainty of this situation is reflected in objective and subjective dimensions regarding the conditions of life.

Lederer et al. (2020) pointed out that the lockdown, staying at home, and virtual learning situations were frequently associated with returning to unstable household situations due to lack of work, reduced income, the need to take care of family members, and deal with the loss of loved ones and difficulties in internet access.

Academic life was transposed from in campus to home context reducing or eliminating formal and informal in-class activities that served as social facilitators. Well-being has been reduced, and multiple stressors - such as health concerns, disruption of sleep patterns, reduced face-to-face interactions, and problematic academic performance - have been recognised. Regarding this situation, harmful coping mechanisms were identified, such as blocking pandemic news, sleeping more, drinking and smoking, and distracting oneself with other tasks. Positive coping mechanisms included meditation, spiritual measures, keeping routines, and positive reframing (Son et al., 2020). Anxiety was also associated with the lockdown situation and gender, with higher values for women (Sundrasen et al., 2020), and was negatively associated with self-efficacy (Alemany-Arrebola et al., 2020)

Learning in a virtual context has been characterized as having both detrimental and positive aspects as described by students. Meeter et al. (2020) pointed out that motivation in this situation was lower and was paired with less time spent in class and study but was matched with more efficiency during online education.

In the second academic year of the pandemic situation, the positive and negative educational impacts must be addressed by institutional

approaches to mitigate the effect in the learning process for students taking into account the context of academic life as well as where they live. Particular attention should be given to freshman and sophomore students due to the limitations of in-class academic life and economic difficulties derived from the decline in commercial activity, job losses, decreasing work opportunities and constraints in the activity of support systems.

In a context of intense use of virtual learning, considering the cognitive principles of learning by using words and pictures in a virtual environment is essential to promote the best teaching and learning experiences.

2. A cognitive approach to multimedia learning

Creating, searching, selecting, and adapting materials for digital learning requires consideration of multimedia learning principles (Mayer, 2009, 2020). The human memory and attention characteristics have impact on the organization of learning materials to optimize the process of receiving, processing and retrieving information.

First, a consideration of how human memory works is essential. Briefly, human memory has two types (explicit and implicit), a three-piece sequential step organization (sensory, short-term, and long-term) and three processes (encoding, storage, and retrieval) (Atkinson & Shiffrin, 1968). This model has been criticized but is still used today and is the basis of a significant number of investigations (Malmberg et al., 2019).

The consciousness remembers episodes by episodic memory, and facts or concepts by semantic memory are components of explicit memory (Nelson, 1985).

Implicit memory alludes to the influence of experience in behaviour. It can be procedural (how to do things that are hard to explain using words), a result of classical conditioning, and priming (behaviour change resulting from frequent or recent experiences such as reading a poem or listening to music) (Walinga & Stangor, 2014).

The three sequential steps of human memory include sensory, short-, and long-term memory. Sensory memory includes an iconic memory for visual elements and echoic for auditory stimulus. It has a limited duration and deletes content if it is not transferred to short-term memory by attention. Short-term memory has a minimal capacity that can be extended by maintenance rehearsal and by dividing the information in chunks to surpass "the magical number seven plus or minus two" limit (Miller, 1956, p. 81). Long-term memory contains a lot of information encoded from short-term memory and recovered by the retrieval process. Long-term memory organizes information in categories, described as associated memories, by features in common, total or partially, and compared to the category prototype. Mental classes contain objects, people, events, and social groups (Atkinson & Shiffrin, 1968).

The construction of personal memories involves the process of encoding, storage, and information retrieval. Establishing relations with other information through the self-reference effect can improve the placing of data in memory. A periodical review of information can reduce the impact of the forgetting curve, use the spacing effect, rely on repeating the learning process, training in conditions, context and state similar to the retrieving situation. Proximity in the context of storage and reactivation facilitates the retrieval of information. Facilitators include the primacy effect (tendency to better remember the first presented information) and the recency effect (tendency to better remember the most recent data). In contrast, interference can be retroactive (previous information interferes with the retrieval of the new one) and proactive (previous learning interference with new learnings) (Atkinson & Shiffrin, 1968).

Considering the brief presentation about memory, how should documents be organized and presented to provide the most efficacy? Mayer (2009, 2020) has been investigating the best practices of multimedia learning. According to him, it is relevant to use simultaneously auditory and visual stimulus (the picture superior effect: Shepard, 1967), and the temporal and spatial continuity of text, images and sounds. The information must be reduced to the main components and be presented redundantly with images and text.

Recently, Schwabish (2016, 2021) proposed three main ideas to organize the learning stimulus. They include the importance of visualizing (using images), unifying the style of visual stimulus (e.g., using similar images in colour and drawing), and focusing by reducing the clutter (creating visual contrast in images to emphasize the main points).

Sound and image files can be used in different contexts but consideration to the legal aspects of copyright is essential.

3. Considerations of copyright issues

The Internet offers resources for digital learning in various forms and with different use conditions in a context that allows and makes duplication very easy (Kramarsky, 2001). However, to ensure legal use and respect to the ownership, users should consider copyright requirements.

There are three main options in the rules of use: commercial use, free use with attribution, and free use without attribution. Commercial use requires a payment that can vary by author, enterprise ownership, and place (country or geographic location). Conditions are diverse depending on context and the type of use (e.g., commercial or non-commercial), and the free option of use with attribution requires the identifying the author(s). Free use without attribution is a situation in which the mention to the original author(s) is not mandatory.

The availability of a digital document does not grant the legal right to use it outside of private use. The user rights can be different according to the context and the objective. Direct use of images searched and found via Google must consider permission issues that can be associated with them .

Presented with the various resources described in the following pages, the reader should considerer them as alternatives to explore in combination with the idea that personal authorship can be as valuable and indeed more refreshing!

The internet presents a vast number of sources of knowledge (i.e., information), but the task of finding the most relevant can

be intimidating. This paper presents some guidance about several kinds of resources available to support enhanced digital teaching and learning. It introduces resources for images of different formats, sounds, and video repositories in the first section. After that, it will describe some of the resources for digital learning websites and the vast number of digital courses available on the internet.

4. Images?

Visual representations are a powerful way of conveying information and evoke emotions. Creating or searching for an image relevant to an e learning document can be an exciting and demanding task due to the context of use and the vast number of resources available.

Images can be digitally stored in two formats: bitmap or vectorial. Bitmap format is usually used for photos, and an increased size in screen is associated with a degradation of quality, and selecting and editing parts is somewhat tricky. Format files include JPEG/JPG, PNG, GIF, TIFF, BMP, and PSD. Vectorial files are employed mainly for text and technical drawing, allowing dimension change without degradation, making component selection and edition easy. Vectorial format files include WMF and SVG (Costa, 2014).

Combining the two electronic formats in one image is possible, and many applications can manipulate and integrate both as Microsoft PowerPoint and Microsoft Word or Adobe Illustrator and Adobe Photoshop. File formats that can combine bitmap and vectorial information include EPS, PDF, PSD and AI (Malamed, 2015). Most image manipulation and presentation applications include or are associated with image repositories (e.g., clipart from Microsoft PowerPoint or Adobe Stock Image and Adobe Stock Free Collection from Adobe). Image data banks can be specialized in one kind of image or combine both.

Applications used mainly to edit bitmap images include Adobe Photoshop, Adobe Photoshop Elements, GIMP (free and open source, can be downloaded at gimp.org), and Microsoft PowerPoint. Applications commonly used to create and edit vectorial images are Adobe Illustrator, Corel Draw, and Inkscape (open source, free and

available to download from inkscape.org). The different applications previously mentioned can open and export files in several formats.

Digital image characteristics include format and colour management. The colour space of images should take into account the context of use. Illustrations created for screen viewing should be made in an RGB (Red, Green, and Blue) colour mode, while those that are going to be printed have to be in a CMYK (Cyan, Magenta, Yellow, and Black) colour mode. Image editing programs like Adobe Photoshop support the colour mode change of images (Christensson, 2006).

Images created with digital tools have two main characteristics that are important to visual quality - resolution, and dimension. These are interdependent for the bitmap format, primarily used in photos. Image resolution is the number of pixels of an image and it interacts with the original size (width and weight) to create the size of the file. More significant numbers mean more detailed pictures and a bigger file, although the final size is encoding-dependent (with none or substantial compression). The visualization size of a bitmap image can be increased, but it decreases visual quality, resulting in a blurry degradation named pixelization. Resolution requirements are different for screen or printing purposes. To print an image, it should have a resolution of 300 dpi (dots per inch), but for screen viewing, a 72 or 96 dpi is enough.

The bitmap image resolution can be reduced but cannot be increased without quality loss. To show a detail of an image, the resolution requirements should consider the dimension of that detail. There are ways to search for an alternative and superior resolution of an image. In Google, the image source search allows a reverse image search. Other options for the same purpose are TinEye, Bing Visual Search, and Yandex. The reverse image search is also helpful to identify the source of an image.

Images can be static (vectorial and bitmap) or depict movement in video format. The leading software platforms (Windows and macOS) of personal computers include free video creation and editing tools. Windows 10 has Microsoft Photos, an application that allows photos and movies edition . MacOS offers iMovie, an application to edit and create movies on Macintosh computers,

iPads, and iPhones . Both apps allow the import and edition, and export of various video formats.

Image creation and manipulation have a vibrant worldwide tradition for various objectives and within different contexts. The personal use of computers made this task much richer. Image creation can be done from scratch with applications like Microsoft PowerPoint or Adobe Illustrator, or with the help of software that helps the use of pre-made images.

4.1 Image creation: diagrams and comics

Image creation can assume the form of diagrams and learning comics. Considered in conjunction, they can be used to express information relations and demonstrations in a rich learning environment

Diagrams, or flowcharts, are simplified drawings representing the structure and working of a dimension of reality. Microsoft PowerPoint includes the Smart Art Graphics option that offers eight categories (list, process, cycle, hierarchy, relationship, matrix, pyramid and structure). A diagram usually includes shapes, text and images organized in a sequence. It is possible to create them from scratch, but the dedicated software allows a more consistent and professional look achieved in less time. Another option includes libraries of diagrams that can be customized. Apps for online and offline diagram creation have the following options:

- Visio (www.microsoft.com/en-ww/microsoft-365/visio/flowchart-software) is a classical reference in diagram software creation. It has many possibilities for visual work on diagrams, flows and planning but is a paid solution. It is available as an application integrated into Microsoft Office to use both offline and online, and can be used by users with special needs.

- Cmaptools (cmap.ihmc.us) is offered freely for educational institutions by the Florida Institute for Human & Learning Cognition as a tool to create concept maps describing knowledge models. The application works both online and offline in Windows, macOS, iOS and Linux, and requires Java to run.

- Diagrams.net, formerly Draw.io (app.diagrams.net), is a completely free online and desktop solution (for web, Windows, macOS, Linux,

and ChromeOS) that can save files directly to services like Google Drive or Dropbox with different output formats (bitmap and vectorial).

- Ayoa (www.ayoa.com) is a mind mapping software that works on the web, iOS, Android, macOS, and Windows. Options include whiteboard, mind maps, workflow, canvas, Gantt, or radial creation. Mind map offers organic map, speed map, and radial map options coupled with chat, real-time collaboration, and task management features. It is free for five boards, and real-time collaboration and the export of mind maps are possible.

- MindMaster (www.edrawsoft.com/mindmaster) is a full-featured cross-platform mind mapping software available for Windows, macOS, Linux, Android, and web. It allows one to build 12 different structures using 33 themes and clipart, with complete customization. A long series of templates are available for diagrams, mind maps, and graphic design but exporting and using is subscription dependent.

Another option for visually rich documents includes software to create learning comics. Several options offer an exciting opportunity to present information and involve the students in developing and adapting learning documents creatively.

- Powtoon (www.powtoon.com/homepage) is a video creation tool that supports communication, collaboration, and information sharing in a personal, educational, and professional context. With an extensive library of templates and video creation tutorials, and an emphasis on animation, this online platform has free use and paid options (pro for $19, pro+ for $59, and $99 for monthly payments - the cost is lower if billed yearly) to promote learning and development. Periodical promotions and special prices are offered.

- Make Beliefs Comix (www.makebeliefscomix.com) is an online platform created by Bill Zimmerman to support ideas and story creation for teachers, parents, ESOL, and students with special needs. Extensive platform information is offered in 13 languages, and a lot of examples are presented with free books available. Arts, communication, collaboration, creativity, and socioemotional learning are promoted. Use is free, and the models and materials are

considered adjusted to 3rd–8th grades in the USA educational system by common sense education website review (www.commonsense.org).

- Pixton (www.pixton.com) is a comic template maker for educators, students, parents and businesses. Limitations include unavailability to draw characters or background, but they are compensated by choice of gender, hair, colour, facial features and pose and upper and lower limbs modification. It is simple to use and has a lot of pre-made art with initial free use but requires payment for unlocking complete functionality (it goes from $9.99 to $25 by month or $99 for annual access).

- Clip Studio Paint Pro/Ex (www.clipstudio.net) takes an alternative scratch approach to comics creation. It is a professional and powerful solution presented in two versions for Windows, macOS, iPad, iPhone, Android, and Chromebook. The Clip Studio Paint Pro is directed for character, concept, and illustration creation and has a one-time low-price purchase ($49.99) or a monthly usage plan ($0.99). Clip Studio Paint Ex is tailored to manga and comics, and animation creation and has a $219 one-time purchase (only for Windows or macOS) and a $2.49 monthly usage plan (for all platforms). Both have trials available, clip studio tips, a Q&A community, and clip studio assets with 10.000+ free materials for commercial and personal use.

- Comic Life (plasq.com/apps/comiclife/macwin) is a Mac, Windows, Chromebook, and iOS app for comics creation. It has a wide selection of templates, fonts, balloons, captions and lettering art, and good design tools. A trial version, for 30 days, is available, and the price is a $29.99 one-time payment (for Mac and Windows), and special education prices are available.

- Comic Creator Studio (summitsoft.com/products/comic-creator) is a primary and easy-to-use comic creator tool great for kids and with loads of assets (600 pre-made props, backgrounds, and background elements). On the downside, it has limited drawing tools and is only available to Windows. It is a $42.99 one-time payment, and there is also a Creative Fonts Comic for $10.99.

4.2 Images, where?

The internet offers different ways of access to visual elements, with size, colour, type, and diverse usage rights.

- Unsplash (unsplash.com) describes itself as the internet source of freely usable images, and offers over 2 million free high-resolution photos from a community of over 211 thousand photographers. Images are organized in numerous collections, and it includes different topics and supports a community for sharing and remixing images.

- Pixabay (pixabay.com) is a repository of 2.2 million shared images, videos, and music. Pictures include photos, vector graphics, and illustrations organized in 12 categories, from Animals to Music. Selection is available through illustration, orientation (horizontal or vertical), size, and colour. The same photo can be in vectorial or bitmap format.

- Pexels (www.pexels.com) shares free photos and videos (near 300.000), with permission to modify them. Attribution is not required but is appreciated. They are organized by collections (adventure, animals, art, background and cover, creative, colours, family, health, plants, sea, style, etc.). The visitor is invited to join the photo challenge, and other subjects include photographer interviews, thematic and curated collections.

- Gratisography (gratisography.com) shares creative photos and vectors divided into nine categories (from animals to whimsical) and eight collections (from amusing animals to whimsical women) with an emphasis on different visual approaches. Users wanting a novel approach to visual communication should look into this website

- Flickr (www.flickr.com) is a place to store and share tens of billions of photos and includes two million groups. Photo licenses supported by Flickr go from All Rights Reserved to Attribution-NonCommercial-NoDerivs and Public Domain Work . Image searches support different licenses and safe search options. The vast number of photos available on this website places it in a category of its own.

- Negative space (negativespace.co) offers a platform for photo

sharing. Photos are organized in 14 categories (from abstract to work) and are all free for personal or commercial use, and there are 315.000+ photos. A brief exploration confirms the great diversity that the numerous categories suggest.

- Free Vector (www.freevector.com) is a website devoted to vector files offering 100.000+ files organized in 56 categories editable with apps like Adobe Illustrator, Corel Draw, and Inkscape, or Vectr (the last two applications are free and open source). Options include illustrations, clipart, and wallpapers. When downloading images, both vectorial and bitmap versions of the files are available.

This list is only an example of the vast amount of photo stock repositories available on the internet. A list offered in 2021 by pt.vu (pt.vu/foto/bancos-de-imagens-gratis) listed 27 websites. They also present an idea that is a good suggestion to end this section: think about making and using personal photos created with a smartphone or a dedicated camera. Also, edit the images to make them more interesting and adapted to your purpose.

Images can be used with or without sound. Sound can be a powerful addition to the communication process, in the form of words or music, by reinforcing or complementing the information presented in the visual stimulus.

5. Sound

Sound files can be used by themselves, e.g., in podcasts or with image files. Sound file creation may be supported by a hardware (microphone) and software combination (for sound and or image registration).

5.1 Creation and edition of sound files

The sound edition can be done within video edition applications or by dedicated apps like Audacity (free, open source, and cross-platform software available for Linux, Windows and macOS systems) and VLC media player. Popular sound file formats include mp3 (a compressed format), the most common audio file format, FLAC (compressed format with no quality loss), AIFF, and wav

(uncompressed audio formats) (freesound.org). The quality and size of sound files are related to the format and codec used to store the information.

The use of sound files can be free, but it is not the most common option. A royalty-free option is more common, and it includes the option of unlimited use of sound files after paying for them. Sound files can be offered in streaming or download.

5.2 Sources of sound files

Sound can be created but there are also many resources available to use previously created sound files in several websites.

- Wikimedia commons (commons.wikimedia.org/wiki/Main_Page) is a component of Wikimedia Foundation that shares 70+ million freely licensed educational media content that includes sounds, images, and videos. Search options include other media like pdfs.

- Freesound (freesound.org) is a huge collaborative database of files, mainly sound effects and real-world sounds, under Creative Commons licenses. Functionality includes search by 'sounds like…', downloading, sharing, and interaction with sound artists.

- Youtube Audio Library (www.youtube.com/channel/UCht8qITGkBvXKsR1Byln-wA) offers a vast amount of music for content creators, 35.000+ soundtracks that can be downloaded freely and safely but must be attributed.

- Free Music Archive (freemusicarchive.org) provides royalty-free music and under the creative commons license from independent artists. Powered by Tribe of Noise, it supports unrestricted access to music from many artists from different countries. The genre includes Blues, Country, Experimental, Hip-Hop, International, Novelty, Pop, Soul RnB, Classical, Electronic, Folk, Instrumental, Jazz, Old-time, Rock, and Spoken.

- Audio Fighter (www.audiofighter.com) presents 833 examples of free background music for personal short films and requires attribution. The website offers examples of sound use.

- Internet Audio Archive from Internet Archive (archive.org/details/audio) provides access to 13+ million audio files from an extensive

array of sources in different languages and different kinds, like audiobooks and live music, with varying licenses to the user.

- Musopen (musopen.org) offers recordings, sheet music, textbooks, and music education materials for free, including classical music with different search criteria available like composer and period.

- Free To Use Music Youtube Channel (www.youtube.com/channel/UCnNWG_mv0-_u-65_uDV9tGw) has free music that can be used on social media platforms like Youtube, Facebook, and Instagram. Personal use is the restriction for using these files. Various kinds of music are offered (e.g., chill music, jazz, hip-hop, chill-hop instrumental) with different time extensions.

- Airborne Sound (www.airbornesound.com) includes several collections of free sound effects (cost is associated with the quality of the file) and a sound FX library (purchased in bundles).

- Envato Elements (elements.envato.com) is a subscription service that offers video, video templates, music, sound effects, graphic templates, and other options. The subscription fee is $12.00/month, and a free files option is included in the 'more categories' section.

After exploring resources on image and sound creation and edition, a new approach to learning is presented in the following section. Access to virtual and structured learning paths can be an important way to improve knowledge acquisition. Before the current pandemic situation and since 2008, an extensive movement was already underway offering virtual versions of college courses (González-González et al., 2014) in the form of Massive Online Open Courses (MOOC).

6. Online Courses

In the following section, I present a list of 10 noteworthy platforms that provide access to online courses, and different educational materials describing the amount and information formats explaining the costs associated and also a link to a review.

- Open Culture (www.openculture.com) offers 1700 free courses from top universities like Oxford, Stanford, Yale, Emory, MIT,

and Harvard. The scope of subjects is vast, with several main areas including Architecture, Art & Art History, Classics, Communication, Demography, Design, Economics & Finance, Education, Film, Geography, Health, History, Writing & Journalism, Language, Law, Literature, Linguistics, Media Studies, Philosophy, Political Science, International Relations, Religion, Sociology, Sciences, Business, Chemistry, Computer Science, Data Science, Environment & Natural Resources, Math, Physics, Personal Development, Psychology & Neuroscience. Furthermore, the Open Culture platform provides 1150 free movies, 700 audiobooks, 800 free ebooks, and 200 free textbooks. This diversity and extension of resources from multiple sources is simply gigantic! Courses include many MOOCs that are free if the 'Full Course, no Certificate' option is chosen in edX, or 'Audit' in Coursera. A fee is included if a certificate or credential is requested. Open Culture is an excellent content aggregator of online learning resources. To read a review, visit: bestcompany.com/audiobooks/company/open-culture.

- Khan Academy (www.khanacademy.org) offers many free and introductory courses on math, science, economics, computing, arts and humanities, economics, reading and language skills, and life skills. The idea is to promote education for everyone, everywhere for students, teachers and parents through personalized learning and trusted content. The content of the website is personalised for different classes of users. Besides courses in English, it must be highlighted that there are translations available and underway to many other languages. Of particular interest is the translation that has been underway to complement the Spanish, French, and Portuguese language contents. To read a review, visit: www.pcmag.com/reviews/khan-academy

- Coursera (www.coursera.org/) collaborates with 200+ universities and companies and offers 5100+ courses with 40+ certificates and 25+ degrees. Classes are about Data Science, Business, Computer Science, Personal Development, Information Technology, Health, Math and logic, Social Sciences, Physical Science and Arts and Humanities. Most courses are free if one uses the audit for the free option. If one opts for the final examination and the certificate, one has to pay. Guided projects also require payment. Coursera Plus

gives access to 3000+ courses with a $399 yearly fee providing access to all of them besides the guided projects. Seven-day free trials are available for these courses. For an extensive review, visit: upskillwise.com/reviews/coursera.

- EDX (www.edx.org) offers 3000+ free unverified courses and verified courses (costing from 50 to $300) in collaboration with 15 universities. Course subjects include data science, language, business, computer science, design, engineering, and humanities. Course and program certificates can require a fee. Courses have different levels: one-off courses, micro masters' programs, professional credentials, global freshmen academy, and the Xseries program. For an extensive review, visit: www.bitdegree.org/online-learning-platforms/edx-review.

- LinkedIn Learning (www.linkedin.com) is one of the world's largest professional networks after acquiring Lynda.com in 2016. It is an e-learning platform offering over 16,000 Massive Open Online Courses (MOOCs) delivered in 7 languages. Course topics include Project Management, Programming Languages, Illustration, Leadership Skills, Drawing, Personal Effectiveness, Data Analysis, Layout, and Composition. You can search courses by subject, software, and learning paths. A Linkedin Learning demo and review can be found on YouTube (www.youtube.com/watch?v=P0r0n8jVrJ). After a first free month trial, an individual subscription costs $37.00 by month, and the yearly subscription includes a 20% saving when compared to the monthly payment ($355.00 for the annual subscription). There is no per course subscription. For an extensive review, visit: www.bitdegree.org/online-learning-platforms/linkedin-learning-review.

- The Great Courses Plus (www.thegreatcoursesplus.com) includes paid video courses, after a free trial, on 14 subjects including economics and finance, science, history, food, and wine, for example. No interaction student-teacher or student-student is provided. This organization is associated with the National Geographic, History Channel, Smithsonian Institution, Mayo Clinic, and The Culinary Institute of America. A three-month plan is $45, and an annual plan costs $150. Free content is available from https://

www.thegreatcoursesdaily.com/free-video-lectures-from-the-great-courses/ For an extensive review, visit: www.pcmag.com/reviews/the-great-courses-plus-lms.

- UDEMY (www.udemy.com) presents itself as the world's largest selection of courses (130,000). Subjects include design, software development, marketing, IT and software, personal growth, business, photography, and music with very differentiated prices (e.g., from $13.99 to $149.99) and available promotions. For an extensive review, visit: www.bitdegree.org/online-learning-platforms/udemy-review.

- Master Class (www.masterclass.com) presents 100+ classes, each one with an average of 20 lessons (10 minutes per lesson) with well-known instructors. Subjects include food, arts and entertainment, business, writing, home and lifestyle, wellness, music, sports and gaming, science and tech, and community and government. Price is $16.67 per month billed annually ($200). For an extensive review, visit: www.businessinsider.com/masterclass-review.

- Skillshare (www.skillshare.com) offers 35,000+ online classes organized in the following categories: animation, design, illustration, lifestyle, photo and film, business, and writing. Learning resources can be attended for free or with a premium membership ($19 per month or $99 a year), and teams' accounts are available. Some reviews point out problems with subscription, refund, and subscription cancellation. Use with caution! For an extensive review, go to: www.pcmag.com/reviews/skillshare.

- MIT OpenCourseWare (www.getsmarter.com/universities/massachusetts-institute-of-technology) includes courses about science, technology, and management delivered in collaboration with GetSmarter. Courses are expensive (e.g., $2,720.00 for Artificial Intelligence: Implications for Business Strategy. GetSmarter (www.getsmarter.com) is an online learning platform that includes courses from 19 North American, English, South African, and Mexican universities.

Conclusion

Multimedia learning, combining image and sound, became an important, and sometimes unique way of maintaining the activities of learning in a context of virtual interaction. In this chapter, the impact of the pandemic context in education was reviewed besides describing a cognitive approach to multimedia learning. After briefly reviewing the different usage rights, image and sound edition and creation was described with indication of websites that offer a lot of resources. Finally, the description of resources was centred on the huge number of MOOCs available as alternative and complementary organized paths to learning.

Two words of caution should be taken into account when reading this chapter. First, even though a great effort was made to present the most updated information on the internet resources described, this is a very dynamic area and change happens frequently. Second, while trying to be accurate, this work relied heavily upon direct access to websites and reviews of the services described. It is advisable to consult the latest information available before deciding what, how, and when to use it in the multimedia learning context.

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Part 2

Moving online as an emergency strategic approach: Case studies

Chapter 5

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Transition to distance learning and teaching: Challenges and perspectives

Over the past months, the COVID-19 pandemic has radically transformed all systems around the world, including higher education, and has affected hundreds of millions of learners and teachers in all countries and on all continents. Therefore, higher education authorities took urgent actions to prevent a learning crisis and sustain higher education. In the Russian Federation, the Ministry of Science and Higher Education ordered on 16 March 2020 that higher education institutions promptly transfer from traditional to distance learning and teaching.

Since 2012, efforts have been made in the Russian Federation to integrate the components of distance learning and teaching in the educational process. This is evidenced by the national steering documents. The Federal Law "On Education in the Russian Federation" dated 29 December 2012 was the key document setting requirements for applying distance learning technologies. At the national level, this law laid the foundations for implementing distance learning and teaching. At the institutional level, universities

were working to introduce these initiatives into the educational process.

Some Russian higher education institutions followed the best European practices that enabled them to easily transfer from traditional to distance learning and teaching. These HEIs mainly focused on four components:

- Designing educational programmes, so that they can be delivered exclusively or partially using distance learning technologies to ensure logical course structure, engaging content presentation, successful collaboration and timely feedback;
- Adjusting content of educational programmes for more effective perception of information by students with different learning modalities and developing student-centred interactive learning activities;
- Fulfilling stakeholders' needs by providing assistance to teaching staff with technology, pedagogy and content through adequate training and peer review, recording and monitoring learning outcomes and rewards for students on their successful completion of educational programmes;
- Introducing support systems and determining the elements of the digital learning environment, which facilitate interactions between staff and students at a distance, as the selection of a single learning management system is crucially important for students to have a common platform across studies.

The next step was the Order of the Ministry of Education and Science of the Russian Federation issued in 2017, which approved the procedure for applying the principles of distance learning and teaching in the educational institutions. According to the provisions of this order, HEIs should disseminate information among stakeholders on educational programmes implemented using distance learning technologies. This learning modality presupposes the operation of a digital learning environment, which ensures the successful completion of educational programmes by students, regardless of their location. When implementing educational programmes or its parts partially or exclusively online, universities

should provide educational and methodological assistance to students and broaden corresponding skills of teaching, research, and administrative staff. The workload and ratio of face-to-face and online classes are independently determined by HEIs, which should record and store the results of the educational process and internal documents in hard and (or) electronic format.

Distance learning and teaching in the Russian Federation is also governed by the Federal State Educational Standards. In addition, the presence of a digital learning environment is a mandatory requirement for the accreditation of secondary vocational and higher education institutions since 2016 according to the Order of the Ministry of Education and Science of the Russian Federation. Thus, for several years, secondary vocational and higher education institutions were working to create, improve and maintain their digital learning environments. However, despite the existence of steering documents and ongoing efforts, the transition to distance learning in Russian higher education institutions took place in different ways due to the diverse qualifications of teaching staff to adopt new teaching methods and pedagogical approaches and varying technical facilities and educational infrastructure to maintain this process.

On 17 March 2020, Penza State University Council decided to transfer all classes to the online mode in order to sustain learning and teaching activities. It became highly relevant to apply e-learning elements and distance technologies, ranging from the use of specific software tools to distance learning methods. PSU adjusted to this transition through adequate rethinking and redesigning of the teaching and learning process. PSU formed a working group, which in the shortest possible time developed recommendations for using the distance learning methods. In this regard, the best foreign practices were analysed (Redecker, 2017; West, 2018; Moore, Diehl, 2019; Proctor et al., 2020). Particular attention was paid to designing administrative strategies and solutions, since the transition to distance learning means "the challenge of developing the different management and administrative changes needed to accomplish good quality distance learning" (Moore, Diehl, 2019). In addition, the working group prepared a questionnaire for assessing the quality

of distance learning at PSU.

To assess the quality of the PSU digital learning environment and identify challenges that students and teaching staff may face, the university conducted the survey in April - May 2020. Data were collected through in-depth interviews in order to gain thorough understanding of student and staff experiences in leaving their comfort zones and adapting to new training modalities. The following topics were considered:

- Technical support for distance learning and teaching at the university;
- Forms of interaction between students and teaching staff and its assessment;
- Quality of teaching and learning materials, guidelines and other documents necessary for clear understanding of requirements and actions;
- Availability of follow-up and feedback for students;
- Change in the amount of workload after transition to distance learning;
- Desire to take some classes remotely after lifting the COVID-19 lockdown.

The most interesting were the answers to the question: "What do students lack in interaction with teaching staff?" These answers can be broadly divided into three sections: technical support and connection quality, learning management and available learning materials, general impression of distance learning and teaching.

The analysis of students' answers showed that in terms of technical support students mostly lacked adequate Internet connection, technical sustainability of the PSU digital learning environment (especially at the beginning) and its user-friendliness (according to students it frequently crashed during classes, so they did not always manage to upload completed assignments on time, but then the situation improved). Nevertheless, 20,7%, and 51,1% of interviewees saw the quality of technical support as excellent and good, respectively, while for 20,1% of students it was satisfactory

and for 8,1% – poor.

According to the results, learning management was praised by survey participants (very satisfied - 45%, somewhat satisfied - 4,.5%, somewhat dissatisfied - 7,4%, very dissatisfied - 2,4%). Moreover, they positively evaluated the quality of learning materials and guidelines (high - 28,5%, sufficient - 57,9%). About 14% of students viewed those academic materials which were used for studies negatively (11,1% - insufficient, 2,5% - low). Within the survey, students enumerated things they miss, namely, practical training, learning materials and visual aids.

70,5% of respondents admitted that the follow-up and feedback were available under distance learning, while 29,5% lacked teachers' feedback on the grades awarded. PSU students would also like to have the opportunity to correct mistakes in papers after their submission. In addition, some students wanted teaching staff to check assignments with a bit more immediacy.

As far as their personal qualities are concerned, students desperately needed skills to correctly prioritise learning, as they had to rearrange their daily life in order to adjust to the new learning modality. They also wish they had more time to complete assignments. After the transition to distance learning, 64,5% of students claimed that the amount of workload increased, for 30,5% it remained stable, and only 5% noticed the decrease in the number of home tasks. Actually, there were several answers, which expressed the plea: "Please give less homework!!!!!!!!"

In general, the impression of distance learning was favourable, so that 52,6% of PSU students voiced the desire to take some classes remotely after COVID-19 restrictions were removed compared to 47,4% of students who preferred traditional learning. However, as many other learners around the world had contended, PSU students identified such drawbacks of distance learning as the lack of face-to-face communication and personal presence. As it was hard to organise practical training within several study fields (e.g. engineering sciences, natural sciences), students required additional explanations and were faced with a shortage of information.

The survey among teaching staff revealed that the most visible challenges in distance teaching were:

- Need for modifying management strategies, teaching methods and activities (lectures, practical classes, laboratory classes);
- Increased demand for quality educational content, especially for practical and laboratory classes;
- Difficulties in monitoring teaching and learning (administering exams, collecting term papers, overseeing graduation thesis defences);
- Need for somewhat similar software tools for arranging curricular activities;
- Uneven quality of software for organising video conferences for large groups of students;
- Insufficient technical support (limited number of modern computers, laptops, tablets);
- Limited Internet access;
- Insufficient performance of the PSU digital learning environment due to the increased load.

Despite these challenges, PSU teaching staff managed to adapt themselves and their students to a new way of teaching and learning. A good back-up for the university community was the PSU digital learning environment. This is a system for online support of the educational process, which has been operating at PSU since 2016. It complements face-to-face learning and contains information on the disciplines, student groups, student academic performance, exam results, e-versions of teaching and learning materials and other elements that help to enrich teacher-student interaction and communication.

The core functions of PSU digital learning environment allow teaching staff to plan and manage classes and other teaching and learning activities. There they track and measure academic performance of students and receive reports on students' learning activity. It enables uploading of digital learning materials (textbooks,

study guides, etc.), as well as collecting and storing student works (completed assignments, laboratory and term papers, projects, etc.).

The PSU digital learning environment is also student-friendly. It provides students with the opportunity to access discipline programmes, textbooks and learning materials, lecture presentations and additional information; run self-study and test assignments; present papers and projects in the electronic format; take pass-fail exams and exams. There is a built-in news and advice forum for students to communicate with other students and teaching staff.

Within the PSU digital learning environment Penza State University operates a YouTube channel to promote digital literacy and tech skills among its teaching staff (https://www.youtube.com/channel/UCS9hsH_YFzX6LVxmrQMNlRw). When the higher education institution suspended face-to-face activities, it initiated several live streams (transition to distance teaching, MyOwnConference: questions and answers, testing in the PSU digital learning environment, electronic dean's office: electronic signature and signing of documents) and webinars (for teaching and administrative staff on software (Google Meet, Zoom) and on thesis defences). Distance learning technologies are seen as a powerful differentiation tool, which inspires teaching staff to improve their classroom management skills, thus upgrading academic performance of their students.

In the context of the COVID-19 pandemic, the teaching staff of the university saw the urgent need for digital solutions in their classrooms. Below are some practices of several PSU teachers in delivering content online to Bachelor's and Master's degree students and to lifelong learners.

Lifelong learning. The PSU Centre for Teaching and Learning Erasmus+ established within the Erasmus+ ENTEP project offers the professional development course "Enhancing Teaching practices in PSU" for teaching and administrative staff of Penza State University. As the university transferred to distance learning, course-takers underwent training using distance technologies via the Zoom platform. Classes were delivered in the asynchronous online mode. In the PSU digital learning environment course participants could

find necessary glossary and assignments, study for seminars, take tests and surveys. This environment enabled checking completed assignments and tests (section "Assignment"), as well as analysing survey results.

The course-takers noted that they did not face scheduling conflicts and challenges, as it was possible to adjust teaching and training in a healthy way.

Bachelor cycle: Computer Science (1st academic year). Under distance learning, the teacher delivered the discipline in a way that resembled the school one, as first-year students needed more details to understand the content of the discipline. Therefore, the full description of topics, assignments, learning materials, and deadlines, as well as the explanation of assessment were provided for each class. Moreover, learning materials illustrating how to complete all laboratory assignments step-by-step were improved to broaden first-year students' understanding of the university requirements. In addition to tests and other assignments, such interactive elements, as forums, role-playing games, and surveys, were used to design the academic discipline in the PSU digital learning environment. Classes were conducted via the Zoom platform in the synchronised video and audio conference mode using screen sharing. The term projects were submitted in the same way: the student made the presentation and demonstrated functioning of the developed application, then his or her groupmates asked the project author questions and they discussed the projects together with their teacher. The use of these strategies in the teaching process minimised the loss of social contact and socialisation, which were desperately needed by first-year students.

Bachelor cycle: Language Practice (in English) (2nd academic year). The teacher offered constant support to students in the social media group (vKontakte), i.e. consulted with them on completing assignments, provided feedback on their work, shared useful materials and links. To make the learning environment more appealing, the teacher sourced YouTube videos consistent with the content of the discipline. Students also noted the increased use of online learning resources, for example, Edpuzzle (an assessment-

centred tool for creating interactive online videos by embedding open-ended or multiple-choice questions, audio notes, audio tracks, video comments) and Edulastic (a user-friendly edtech tool for creating and assigning digital assessments). These tools were applied to generate and retain students' interest in the discipline.

Bachelor cycle: Computer Data Processing Structures and Algorithms (2nd academic year). The model of a flipped classroom was implemented within the discipline, so students viewed slide or video presentations in advance. Surveys in the form of the forum conversations (in the section "Questions and Answers") were conducted among students in the digital learning environment. Based on the students' requests, the most complicated topics were considered with multiple examples given in the synchronous mode. Video fragments of such explanations were uploaded in the PSU digital learning environment. During the semester, students presented completed laboratory assignments using screen sharing in Skype, while laboratory reports were delivered in the learning environment (section "Assignments"), so that the teaching staff had the opportunity to check them on the spot. In the course of laboratory or practical classes, students gave answers to additional questions in the forum or under online communication with the teacher.

Bachelor cycle: Literary Text Analysis (in German) (5th academic year). In the context of suspending face-to-face learning, online delivery of this discipline was marked by alternating forms of presenting completed assignments. Depending on the type of assignment, students uploaded it in the PSU digital learning environment, sent audio files with their answers via WhatsApp, or communicated with the teacher in Skype. Therefore, the teacher assessed the completed assignments and made detailed comments in the form of an audio file via WhatsApp. In addition, the teacher recorded assignment instructions and mini-lectures to illuminate the written content and affirm students' commitment to the discipline. The social media group (in WhatsApp) was used for communication, i.e. asking and answering questions in real time, responding to study-related challenges, giving and discussing feedback, tracking study milestones, etc.

Master cycle: Information Systems Design Methodologies (1st academic year). The transition to distance teaching within this discipline was successful. Master's degree students were already experienced in independent work with learning materials and open educational resources. As many students were trained and employed at the same time, before the pandemic it was challenging for them to combine and balance these activities. However, the transfer of many software development companies to remote work contributed to students' active involvement in the discipline. Master's degree students were able to plan their time and almost always attended classes in the video or audio conference mode. In addition, a small number of students (<10) in the group also had a positive impact on the learning process, as they progressed through the discipline material more consciously and more quickly and in addition feedback was always available. The teacher also introduced some interactive teaching strategies (e.g. Q&A sessions, buzz sessions) that proved effective and decisive.

The transfer to distance learning within the Bachelor and Master cycles led to the adaptation of the disciplines in the following way:

1. Teaching strategy comprised the components of active and interactive learning from both traditional and blended learning approaches;

2. Asynchronous learning presupposed using such digital learning environment elements as forums, surveys, tests, assignments;

3. The digital learning environment intensified students' activity, but timely implementation of laboratory assignments and term projects in the online mode became even more difficult for them;

4. Skype and Zoom were used to conduct classes in the synchronous online mode, so various presentations, projects and solutions were screen shared;

5. Checking of student assignments under distance teaching was clearly more labour-intensive that required introducing effective assessment tools to reliably verify academic performance of students using the PSU digital learning environment;

6. The teaching staff took some measures to diagnose, compensate

and validate learning achievements of their students (meaningful feedback, frequent evaluations, individualised monitoring, students' grade evolution);

7. Additional materials were designed for practical and laboratory classes in order to cover the most complicated topics.

The fact that face-to-face teaching was suspended caused changes in the way exams and pass-fail exams were taken at Penza State University. They were not postponed or cancelled unlike many institutions around the world, but they were revised to some extent. The PSU teaching staff opted for three strategies: taking exams with isomorphic questions, online testing and collaborative passing of exams.

The teaching staff used the pools of varying, but equally difficult questions they had elaborated before. This was the most traditional strategy of administering exams, which did not prevent students from using additional materials (such as notes, textbooks, etc.) or accessing the Internet, but minimised misunderstandings and technical problems. The second strategy was more effort-and time-consuming, as it required designing interim or final tests or employing special software tools. It also did not eliminate cheating, but testing was timed, so that students who studied the material well did not need to peep into their notes or use other resources, while those who did not master the discipline did not have enough time to browse answers on the Internet. The last strategy was the most challenging, as teaching staff put more complicated questions to assess and shape critical thinking among students. At the same time this strategy was effective, because students had the opportunity to collaborate, exchange opinions, look into their notes and use other materials. Every solution had its own benefits and drawbacks, but all in all they were viable.

The COVID-19 pandemic also forced transferring the defence of students' graduation theses to the videoconference mode. The platform for presenting research findings and defending projects was Google Meet, under which students were able to put forward their research ideas and screen share obtained results. During the semester, research supervisors organised and held video and audio

conferences for their graduate students in Skype, Zoom or Google Meet to discuss questions, outline the defence structure and give more detailed feedback. They checked graduation theses in the asynchronous mode via emailing. Similar to the traditional mode, the university departments arranged pre-defence meetings on the same platforms to lay ground rules, troubleshoot and exclude possible problems. On successful defence of a thesis, administrative staff registered all documents through the PSU digital learning environment. Therefore, thesis defence at PSU went smoothly.

Following the academic semester, it was noted that the learning of Bachelor's and Master's degree students was the most productive if implemented in the forums with synchronised communication in Skype or Zoom. Teaching staff also assumed that the use of distance learning components, primarily the synchronous strategy, would be also effective for Master's degree students in the future under the traditional educational process.

By the end of the semester, overall impressions of the majority of PSU students about distance learning were positive despite occasional difficulties, but not all students managed to successfully adapt to the new mode of learning. They stated that teaching staff gave them instant feedback on the completed (possibly partially) assignments. The online format guaranteed the dynamic interaction between teaching staff and students, so they were able to additionally clarify and discuss arising issues using distance learning mechanisms. However, PSU teaching staff identified increased workload and limited personal time due to their commitment to give instant follow-up and feedback to students as the major disadvantage of the new modality.

The results of the spring examination session at Penza State University in the 2019/2020 academic year showed that:

- The transition to distance learning under the extraordinary situation was most difficult for first-year students, as they did not fully enter the university environment and did not adopt the learning methods characteristic of higher education (such as independent work, planning, etc.);

- The older the students were, the easier the transition was, since teaching staff used strategies and methods already known to students.

Under the distance mode it became apparent that traditional learning within the Bachelor and Master cycles should be revised and that the principles of blended learning, flipped classroom and student-centred teaching and learning should be applied, for example, to focus students' attention on the important and complicated topics. The experience gained from the onset of the pandemic may enable promoting innovative technologies and working out new teaching methods both in distance and traditional learning. However, online solutions will require relevant content, effective and adequate teaching models, as well as a supportive learning environment.

Lifelong learning can be effectively implemented exclusively within e-learning using distance learning technologies, as students or trainees have strong motivation, independent learning and time management skills. This will ensure flexibility in terms of time and effort, thus providing lifelong learners (e.g. professional development course-takers) with the best possible learning experience at any time or in any place. It can increase the capacity of the university to employ alternative modes of education delivery.

Reviewing the transition to distance learning and teaching in the context of the COVID-19 pandemic, Penza State University sees the need to reflect on the experience gained, further analyse teaching strategies and introduce the best practices in the future with the view to the social and emotional welfare of university students and staff. Nowadays, it is difficult to foresee the impact that distance learning and teaching may have on higher education in general and on PSU students and staff in particular, but it is essential to advance the learning environment, to digitalise assessment tools, to design and use interactive software solutions for practical training (e.g. web services, interactive simulators, virtual laboratories), as well as to develop and adopt various methods for giving feedback to students depending on learning outcomes and discipline content.

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Chapter 6

Holger Kusse

Historical linguistics in online teaching: Experiences from Slavic Studies

The coronavirus pandemic has significantly changed university teaching, especially through how much has now moved online. Online teaching of course was evident before 2020, however it was not the usual practice at universities as it is now. Although the switch to digital teaching could be managed well, it is not equally effective in all disciplines. For instance, a lecture in the humanities can be recorded and made available in the cloud, and a seminar, in which students mainly give PowerPoint presentations, can also be easily conducted in one of the established videoconferencing formats such as Zoom or BigBlueButton. On the other hand, practical language training is much more difficult. For example, how effective a course in Russian conducted via Zoom can be, remains to be seen. This applies in principle to all subjects in which practical skills are to be taught. One such area is historical linguistics, where the aim is not only to give knowledge about previous epochs in the history of languages, but above all to develop skills, to read historical sources and, ideally, even to translate them.

This last target, translation competence, can hardly be achieved today under the conditions of the Bologna reform. The topics covered in the curriculum today are too diverse and time is too short, especially in Bachelor's programs. Whilst this has nothing to do with the transition to digital teaching, there are apprehensions that the digitalization of teaching will make it even more difficult to implement historical linguistics in study programmes. In the following, I would therefore like to use the example of my own course on the historical forms of Slavic languages to show that digital teaching can be a beneficial opportunity for historical linguistics.

The origin of Slavic Studies in the history of language

Let us first ask: "What role should historical linguistics play today in the study of linguistics and literature?" More than 100 years ago this question would not have been understood at all. A subject such as Slavic Studies understood itself quite naturally as a historical science, which is primarily concerned with the history of language and, secondarily, with the history of literature. The founder of Slavistics, the Czech philologist Josef Dobrovský (1753-1829), emerged in 1822 with the first scientific grammar of Old Church Slavonic, which is the Slavic religious language developed by the Byzantine scholars and clergymen Cyril and Methodius in the middle of the 9th century for Bible translations, liturgy, etc. Old Church Slavonic is known for being the "Latin" of the Slavic languages, and in addition, because of its possible Bulgarian origin of the Saints Cyril and Methodius and the importance of Old Church Slavonic in the first Bulgarian Empire in the 10th century, it is also called "Old Bulgarian". Generations of students have studied Slavic Studies with the "Handbook of the Old Bulgarian (Old Church Slavonic) Language" (Handbuch der altbulgarischen (altkirchenslavischen) Sprache) by Johann Heinrich August Leskien (1840-1916). It appeared in its first edition in 1871 and was reprinted continuously until the end of 1960s. The so far last edition appeared in 1990 (Leskien, 1990). This historical orientation however slowly changed at German universities in the 1970s and 1980s. In this time, under the influence of generative and functional linguistics, contemporary

languages came to the fore in research and teaching, and later, with pragmalinguistics, completely different questions arose: How do people speak to each other? What communicative rules are typical of Czech, Polish, Russian, etc.? What, for example, are the special features of political communication in the various Slavic countries?

As late as 1978, however, the linguist Rudolf Aitzetmüller (1923-2000) was still convinced that the oldest Slavic literary language was and would remain the basis for studying Slavic Studies. "Old Bulgarian Grammar as an Introduction to Slavic Linguistics" (Altbulgarische Grammatik als Einführung in die slavische Sprachwissenschaft) is the title of his major work, and in the preface one can read: "Old Bulgarian grammar is the basis for the study of Slavic philology. It has possessed this position from the very beginning and has been able to maintain it until the present day" (Aitzetmüller, 1978, p. IX; translation: HK). Yet, that is a long time ago. In the eighties, I had to attend a two-semester course in Old Church Slavonic during my studies. When I started to teach it, it only had one semester left. Moreover, there is not only "Old Church Slavonic", but also "Old Russian", "Old Polish", "Old Czech", etc. These various historical languages and linguistic developments can no longer be dealt with in detail in the brevity of a BA course, and the question arises: How much medieval language competence does a Slavist actually need in order to be considered competent in his or her subject?

However, the consequence cannot and must not be to dispense entirely with language history. Historical awareness is also part of philological competence, and the current cultural, linguistic and political conflicts show how important this is. The Russian-Ukrainian conflict is only a brief example (Kusse, 2019a). Although this conflict is not primarily a language conflict, this is also part of it, in which the relationship between Russian and Ukrainian is at stake. From the perspective of Russian imperialism, Ukrainian is a dialect of Russian, and the language used during the Kiev Empire between the 10th and 13th centuries is called "Old Russian". From the perspective of Ukrainian nationalism, the language of that period is already "Old Ukrainian". With a little historical knowledge, students can recognize that the Old-East Slavic of the Middle Ages

is neither "Old Russian" nor "Old Ukrainian", but a language form in its own right, from which the various East Slavic languages, especially Russian, Ukrainian, Belarusian, have developed under different influences.

Challenges of online teaching

Only a few years ago Davidson-Shivers, Rasmusen and Lowenthal (2018) distinguished three types of online instruction: "Fully online instruction", "Blended instruction" and "Web-enhanced instruction" (Davdison-Shivers, Rasmusen and Lowenthal, 2018, p. 22). In blended instruction completely online sessions are combined with face-to-face meetings, whereas in web-enhanced instruction regular face-to-face classroom activities are supported by additional Web assignments. In case of fully online instruction the whole communication runs virtually through e-mails and other tools (ibidem). What is not shown in this typology, is the distant learning we practice because of the pandemic situation that does not allow physical face-to-face communication, i.e. the usage of learning platforms, e-mails and social media on the one hand and regular virtual face-to-face meetings via Zoom, Skype, MS Teams or other opportunities. In a way this is a form of blended learning, in which we can organize presentations, discussions and teacher centered instruction, but all in the digital, and not in the physical space. Some of the challenges that are seen in discussions of the benefits and disadvantages of digital teaching and learning, such as learners isolation, technology barriers, digital anxiety (ibidem, p. 13), "financial and technical problems", "problems of methodological and digital nature", like the incapability of teaching staff to use digital tools and develop innovative methodological approaches for them, or "problems of psychological origin", for instance a "low level of responsibility and self-regulation" on sides of the teachers and the students (Nikiforova, 2021, p. 3; cf. Jokiaho & May, 2017), are possible to overcome by training and at least by doing. Even the "discussion method" which is of high importance for teaching and learning in humanities can be realized despite of the difficulties that arise because of the real distance between speakers (cf. Glotova and Kolchugina, 2021).

But there are also different challenges related to the content of teaching and learning itself. In the case of historical linguistics, the question arises, how to deal with a topic, which is mostly concentrated on language and written texts. Therefore we have to find and develop methods in using one of the benefits of digital learning and teaching: the benefit of multimodality, i.e. the simultaneous usage of texts and the visual and even auditory forms of historical documents. Notably, an important 17th century linguistic historical document, Jan Amos Comenius' "Orbis sensualium pictus" is known as the first example of a multimodal textbook based on texts and pictures (Süss, Lampert and Trültzsch-Wijnen, 2018, p. 164; Kusse, 2019b). The need to move all teaching into the digital space makes it possible to rediscover the interplay of the linguistic and textual levels with the visual (graphic and illuminations) and, finally, the phonetic level of the historical linguistic monuments, and to incorporate them into teaching more intensively than before. The multimodal approach is not only motivational and opens the way for creative students to work. It gives a deeper understanding of historical linguistics itself. Therefore a wide range of existing internet tools can be and should be used: digital prints, annotated texts, phonetic material.

The historical linguistics of Slavic languages in online teaching

The course, which is offered in the short period of one semester with a double lesson per week, is intended to introduce students to the relevant periods of the medieval language history, the sources and most important texts and the linguistic differences between Old Church Slavonic, Old East Slavonic and Old West Slavonic, and to give students the competence to deal with them independently. For this purpose, I have compiled a script containing basic grammar and information about the alphabets, texts and cultural backgrounds of these languages from the 9th to the 16th century. As in a textbook, there are a number of questions and exercises for each chapter. The script is available at TU Dresden on the learning platform Opal. On this platform there are more advanced materials, especially papers and books in digital form, which are intended for self-study and the preparation of small presentations. In addition, presentations by the

lecturers and students are also available here. This is the first task of the students: Students read the script and work on the exercises.

But this is still traditional teaching. The platform is like a shelf with many materials and not yet the actual digital teaching. This begins when teacher and students meet in the digital space. Together they discuss elementary features of the historical languages: the historical writings, peculiarities of the tempus system, important lexical phenomena and important texts. Information given in the script is further elementalized, because the most important objective should be the creative work of the students themselves. In the seminars, students present individual topics of the history of the Slavic languages, incorporating creative and interactive elements. They integrate film clips and other material into their presentations. They develop little riddles about the history of language, which are solved by the group in the chat or breakrooms.

In the east and northeast of Germany, for example, there are many place and water names that date from the time of Slavic settlement between the 7th and 13th centuries. To the east of Dresden, Upper Sorbian and Lower Sorbian are two small Slavic languages. Therefore, through the form of a riddle, the students are asked of the Slavic roots and etymological meanings of place names, namely: Which place and/or which area hides itself behind these Sorbian names? From what are the place names possibly derived?

Examples:

- Land of the "Lusitzi" > "Lausitz"
- "Kamenica" > "Chemnitz" < "kamen" (stone)
- "Budyšin" > "Bautzen" < derived from personal name: Settlement of "Budych" or "Budyš"
- "Žitawa" > "Zittau" < "žito" (Grain, Grain location)

In this way, students learn to recognize Slavic word roots. The skills that are to be acquired in the course also include the ability to deal with sources independently. Today, there are a lot of materials on historical linguistics on the Internet. Students are introduced to the work with these websites and work on them together during the

online lessons. Two such websites are mentioned here. In Novgorod there was an everyday written culture in the Middle Ages. People wrote small texts on birch bark, which were sent as messages. As a result an engaging nickname for this has been coined: "SMS of the Middle Ages". Additionally, under the address "http://gramoty.ru/birchbark" excellent photographs, transcriptions and Russian translations of these texts are available. They can be selected and discussed together in online lessons, and individual exercises in break rooms or as homework should follow.

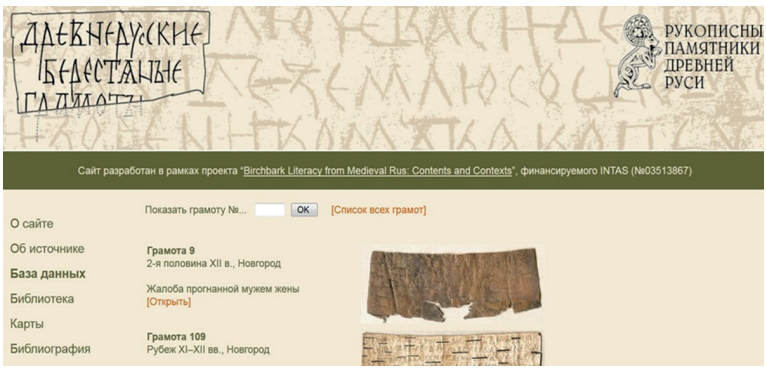

Figure 1. source: http://gramoty.ru/birchbark [last visit: February 2020]

A second example is the digitization of the "Freising manuscripts" (Brižinski spomeniki: "http://nl.ijs.si/e-zrc/bs/html/bsCT.html#bsCT-int"). On this page you can see the facsimiles of this first Slavic text in Latin letters from the second half of the 10th century. Variants of the trascription can be highlighted. An additional special feature of this is that the text is recorded and thus the medieval West Slavic can be heard.

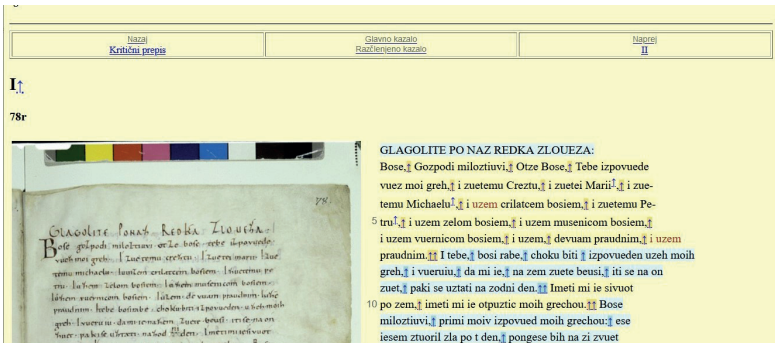

Figure 2. Source: http://nl.ijs.si/e-zrc/bs/html/bsCT.html#bsCT-int [last visit: February 2020]

The course thus introduces students to the basics of the historical linguistics of Slavic. They learn about elementary grammatical phenomena and develop the ability to recognize Slavic word roots. Above all, they discover the diversity of historical linguistics and the creative use of the sources. To this end, the work with websites discussed in the shared digital room is of particular importance.

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Chapter 7

Liao Xuerong and Sheng Yan

Blended online teaching in the college course Early Childhood Psychology

Unexpectedly, the COVID-19 pandemic has disrupted the normative teaching and learning modality since its outbreak in January, 2020. In this situation, the guidelines from the Ministry of Education in China formulate that no teaching and learning should be halted even when schools are closed. All colleges and universities nationwide have practiced online teaching and learning to replace traditional face-to-face teaching and learning (Jiao, Zhou & Chen, 2020). Online teaching breaks through space constraints of classroom teaching and is characterized by flexibility and high-efficiency. Students can make use of fragmented time to study and enjoy higher autonomy in their learning. On the other hand, students' online learning is motivated by their interests and is difficult for teachers to supervise closely. Knowledge from the fragmented learning is not systematic. Online video lectures impart theoretical knowledge of a course but can not transfer implicit knowledge and this makes it difficult for students to cultivate practical abilities (Su et al., 2015). As an example of this, the course, the course Early childhood psychology has reformed

the existing online teaching modes and adopted an innovative blended teaching modality which combines SPOC online video lecturing with live-streaming teaching with an aim of cultivating both students' theoretical and practical competence.[3] This teaching experiment has achieved expected results. It shows that this trial is worth sharing and promotion, and shall bring more implications for blended teaching in this technology-based era.

1. Design of the online blended teaching modality

1.1 Principles for the design

The course design has followed the framework of two learning theories. It was predicated on the Meaningful Learning theory first proposed by Ausubel (1963). He pointed out that students could achieve maximum learning effects through meaningful learning. Therefore, to maximize the effects of its online learning, this course chose a well-recorded courseware from the Chinese University MOOC - an online open teaching platform - with an expected role of facilitating students' meaningful learning. This choice followed the suggestions from He (2014) and included the following four criteria: whether the selected course will facilitate students' meaningful learning and mastery of basic knowledge of this course; whether the course design integrates theories with real life practice; whether the course connects the new knowledge with students' previous experiences; whether the teacher instructs in a vivid and concrete manner; whether it can motivate students; and whether teaching contents and resources are rich..

Bloom's (1956) taxonomy of educational objectives has also shed light on this course. He explained that students must gain high-level cognitive abilities, such as application, analysis, synthesis and evaluation, through active learning. Accordingly, the ultimate goal

[3] Spoc: proposed by Armando Fox (2013), small private online coures. The word "small" is used as a contrast to "Massive" and "Open" in MOOC. Small usually refers to a small number of students ranging from dozens to hundreds; "Private" means that students must be qualified enough to sign up for admission to the SPOC courses. Teachers can select, add and adapt online teaching resources on this platform according to their specific teaching objectives and agenda.

for this course was set up to cultivate and improve on students' professional competence, namely, ability in analyzing, evaluating and solving problems of pre-school children's development. However, this goal is usually hard to realize through online teaching alone. Therefore, this course added the part of live-streaming teaching to the design in order to achieve the teaching objectives. In addition, an after-class practicum assignment was in place to deepen and internalize students' cognitive knowledge and bring their abilities to the high-end level of Bloom's taxonomy (Bloom, 1956) through this course learning.

1.2 Teaching objectives of blended online teaching

Early Childhood Psychology is a core course with 48 credit hours and 3 credit points for first year the students of preschool education major. The course has three levels of teaching objectives: knowledge level, awareness level and skill level. First, students are able to understand basic knowledge of the subject, including concepts and theories regarding early childhood development through online video lecturing. Second, students can cultivate a scientific and professional attitude towards pre-school education. Third, with the help of live streaming teaching, students can improve their professional competence in analyzing the development of preschool children and their education, and can internalize the knowledge through after-class practices. Thus students can in turn apply their knowledge to real-world problems related to preschool children's development and their education.

1.3 Teaching contents of blended online teaching

The course's contents comprised three parts, namely, online lectures, which included pre-recorded videos, online unit tests and online discussion; live-streaming classes, which focused on the textbook, group discussion and exercises; after-class practices, which was conducted through field observation of preschool children's daily life and their kindergarten hours.

2. The Implementation and Assessment of the Blended Online Teaching Mode

2.1 The class organization of the Blended Online Teaching Mode

The course consisted of online lectures, live-streaming classes and after-class practices. Recorded lectures were put on the MOOC an online open learning platform for college students. MOOC has its edge over traditional offline classes for its vivid demonstrations with videos and pictures. But it is hard to conduct in-class real-time exchange between students and the teacher (Chen, 2016). To fix this problem, SPOC is used to integrate the online teaching part with face-to-face class teaching (ibid). SPOC is normally designed for a certain small group of students. This course adapted the online course To Know What's in Children's Mind designed by He (2020) at Zhejiang University into a SPOC for 61 students. Students watched videos, posted discussions on the online board and took unit tests at any time and place based on their own schedule. Besides online autonomous learning, live-streaming classes were held once a week with 3 sessions each as a replacement for offline class teaching during this pandemic. Teachers delivered the contents of self-designed teaching materials, combed through key and difficult points and provided related supplementary knowledge. Teachers and students interacted through face to face online discussions and Q&As. After class, students made observations about pre-school children or conducted field research on the assigned topics in kindergartens under the arrangement of the college or autonomously.

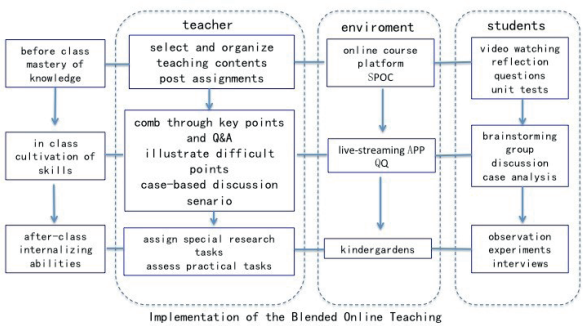

Figure 1. Implementation of Blended online Teaching

Three types of teaching pedagogy were adopted in the whole teaching procedure. The first relied on verbal language to lecture, present and discuss. The second capitalized on intuitive teaching tools such as graphs, field trips and experimental demonstrations. The third was practical, mainly manifested as exercises, internship experiences and field investigation.

In total, students have finished 41 videos, previewing tests and discussions for 8 units, 14 online discussions, 12 in-class exercises and 7 feature reports throughout the semester.

2.2 Assessment in the Blended Online Teaching Mode

Students were graded for fulfillment of tasks before class, in class and after class. 35% of the total score was set aside for tasks before class which include watching online lectures, online discussion and unit tests. Attendance of live-streaming classes, in-class performance and group discuss accounted for 45%. After-class tasks mainly involved, special projects such as field observations, interviews and experiments, comprising 20% of the total grades.

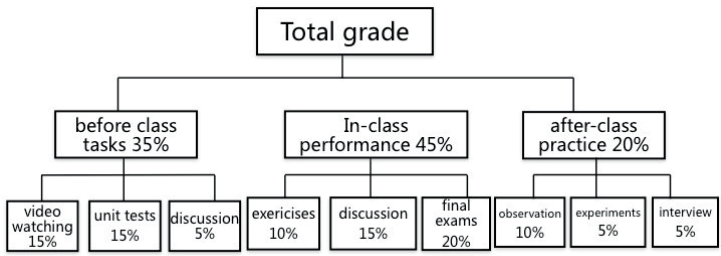

Figure 2. The configuration of students' final grade

The course adopted a dynamic and process-oriented learning assessment system with an ultimate goal of motivating students to actively participate in all learning phases (Su et al., 2015). This assessment portfolio evaluated students' performance before class, in class and after class, and examined both students' knowledge level and practical abilities. It combined formative assessment with summative assessment to encourage students to be fully engaged and enhance their learning efficacy. The specific assessment behaviors are shown in the following matrix.

Table 1. Assessment types and contents

Grades	Content		Formative assessment	Summative assessment	Knowledge assessment	Skill assessment
Before class	Videos		√			
	Unit Tests			√	√	
	Discussion		√			√
In Class	Exercise			√	√	
	discussion		√			√
	Final Exam	memorizing		√	√	
		Problem-solving		√		√
After-Class	Observation		√			√
	Research		√			√
	Interview		√			√

3. Effectiveness of the Blended Online Teaching Mode

He (2014) and Liu (2016) concluded that the blended digital teaching method could help students construct their individualized learning and is aligned with development patterns of students' cognitive abilities. To add as another corroboration, The Blended Online Teaching Mode for this semester-long course, namely, SPOC plus live-streaming classes, has achieved positive effects. The conclusion drawn from online learning data has shown that students have taken the initiative in learning. Their grades in exercises, tests and exams have demonstrated their good mastery of basic knowledge. Students' performance in group discussions and after-class practices has shown that they can think actively, raise questions, solve problems and enhance their skills.

Throughout the whole process of learning, students posted 601 comments on the online discussion board and attended live streaming classes for up to 943 times. They completed 86% of tasks on average, and all of them finished watching videos. This suggested that students enjoyed a positive and active learning experience. Moreover, students' willingness to submit questions to clear doubts and their participation in discussion demonstrated their positive attitude towards learning. Overall, both students' online learning hours and times have presented their tendencies to take the initiative in learning.

The average grades for in-class exercises and unit tests are 80 and 90 respectively, and the average final grade is 87.8. This justified the effectiveness of the blended online teaching.

4. Innovation of the Blended Online Teaching

This course has innovated teaching methods, teaching tools and assessment methods. The course adopted the case study teaching method. It has applied theories into practice, which proved successful in helping students improve skills. Different from traditional teaching methods, it focused on both theories and practice, and on both ability and knowledge, Combining videos, live broadcast, and after-class practices, teachers lead students to internalize their knowledge through application. Different from the traditional assessment model which emphasizes results over process, assessment strategies for this course were dynamic and a good mix of various assessment methods. This successfully encouraged students to develop good learning habits and become fully engaged in learning. Additionally, this course creatively used videos of experimental demonstration on MOOC as supplementary teaching resources, which helped overcome the shortage of experimental facilities and labs in our school.

5. Reflection on the Blended Online Teaching Mode

Regardless of all the achievements of the blended teaching, live-streaming classes can not function exactly the same way as traditional face-to-face instruction to due to physical distancing constraints. For example, online classes can not provide a ritual aura as a traditional class does. There is a lack of eye contact, body language, facial expression and emotional exchange between teachers and students. It also put some limits on communication and feedback in and after class (Sun, 2017). When the pandemic is over, teachers should give full play to advantages of online and offline teaching, and combine online resources, such as tutorial videos and live class, with the traditional classroom to optimize students' learning effects.

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Chapter 8

Yan Zhang and Heping Li

Responsive online teaching of Media Management and self-efficacy

A new corona epidemic sweeping the world in 2020 disrupted the daily teaching arrangements of universities. Fortunately, Internet technology makes online teaching feasible. Media Management is a course integrating theory into practice, designed for third-year students of the School of Journalism and Communication in a Chinese university. Adhering to the ideal that teaching is both science and art, the course instructor conducted an action research project and implemented an online teaching course with many alterations and transformations. In the three- stage course instruction, formative assessment was adopted, and student feedback was collected in a timely manner. Together with the university's online evaluation system, the course was assessed.

1. Instruction design of Media Management

Due to the Covid- 19 pandemic, the Media Management course was reconstructed to adapt to online teaching and to improve student

learning. After redesigning, this course included a two-week course introduction, eight-weeks of lectures, and six-weeks for presentation of case studies of media management both domestically and internationally. Each phase of student learning was integrated into a formative assessment instrument which decided the final score of this course as the university approved the application for the final examination of this course to be waived. Formative assessment previously unheard of on campus was adopted to evaluate student learning. It was chosen because it could inform students of their learning development, reminding them whether they had finished all the learning tasks and pointing out where they could improve, by providing information such as attendance. Dingtalk, an online software for communication, was utilized in this course as a teaching platform which published notices, such as student attendance and reading materials, and recorded student performance.

2. Instruction of Media Management

Media Management was conducted in three phases. The first phase started with the introduction to the course. During the introduction phase, the instructor explained the necessity and significance of the course. Media Management was set up due to China's vigorous development in the culture industry. As the high-end product of culture industry, the expansion of media economy has become an important force in China's social development. Against this background, talents with mastery both in media techniques and media management are urgently needed. To satisfy this need, news communication colleges began to set up media management courses in order to cultivate and reserve talents in media business.

In addition, the instructor also introduced the role of this course in the national graduate examination as many students choose to apply to graduate schools upon graduation. Universities and colleges have consecutively established courses such as media economics, media management in their master and doctor programs in the first-level discipline of journalism and communication. As a media economics major not only belongs to Applied Economics, but also to News and Communication, many renowned universities across China enrol

graduates in media management, such as the School of Culture and Media of the Central University of Finance and Economics, China Media University, Renmin University, and Fudan University. Students who are interested in research in media management should have a good command of this course.

Therefore, the course introduction oriented the third-year students historically, pragmatically, and academically. It informed students of the arrival of the era of media economy. As media management is a must for students majoring in news and communication, students should pay adequate attention to it both for their future employment or academic research.

As an advance organizer, the course introduction provides an information preview of the course content, including key points and related important conceptual structures. The knowledge points (see Table 1) of the course introduction stage included key terms of each chapter, with the purpose of facilitating students' information searching in their group activities.

Table 1. Key concepts of each chapter

Chapters	Knowledge points
One: Media and media industry	Media organization, products, industry
Two: Media and media philosophy	Service, brand, effectiveness, innovation
Three: Media operation	Media product management, media advertising management, media multi-business
Four: Media management	Media human resources management, media financial management, media property management, media information resources management, media production management
Five: Operation of media groups	Conglomeration, group companies, economies of scale, economies of scope
Six: Media capital management	Listing and de-listing, mergers and acquisitions, splits and mergers
Seven: Media market:	Mono-market (content market or advertising market),binary market (content market plus advertising market), multi-markets
Eight: Media Macro Management	Legal management, public opinion publicity management, administration, media economic management
Nine: Media macro environment	Political environment, economic environment, legal environment, cultural environment, technical environment, population environment

The Course introduction was followed by student work. Two of the classes included the organization of student study groups with their group leaders chosen by group members and the selection of a public company (see Table 2) for their case study. Students should have a clear understanding of their roles in their group work and

do their work accordingly. If they have any questions, they should contact the instructor for further instructions. Presentation would take place according to the order written on the piece of paper drawn up by each group in the last six weeks.

Case study is a method to cultivate students' active learning. A concern frequently discussed by faculty members as they consider adopting active learning is that students might oppose the change (Deslauriers, Schelew & Wieman, 2011). What transpired after a six-week session of new teaching was that students became engaged in the course introduction and lectures on the chapters. The many benefits students derive from working in small groups were well documented (Gatfield, 1999), including students' acquisition of analytic, communication, and behavioral skills.

Table 2. Public companies for case study

Chinese media groups	Foreign media groups
Enlight Media	The Walt Disney Company
H. Brothers Media corporation	Sony corporation
Wanda Cinemas	Bertelsmann
Huace Group	Warner Media
Alibaba. Pictures	ViacomCBS Inc
Guangdong Alpha Animation and Culture Co, Ltd	New York Times
Bona Film Group	News Corporation

In order to facilitate the collection of information and data efficiently for students, teachers provided relevant books, a resources website, and guided students to pay attention to media entrepreneurs' talk shows and media entrepreneurs' autobiographies, which helped students to understand media entrepreneurs' business management philosophy.

This course adopts a similar teaching model to Presentation-Assimilation-Discussion. Week 3 to Week 10 were devoted to the instructor's lectures and video observation. Lectures could help students gain a deeper understanding of the key concepts introduced in the course introduction.

Activating students' self-efficacy in teaching

Albert Bandura, the founder of social learning theory, proposed

the self-efficacy theory in 1977 to explain the causes of motivation in special situations from the perspective of social learning. But Bandura's concept of self-efficacy varies in different historical periods. Guo and Jiang (2008) argued that self-efficacy actually referred to people's expectations, perceptions, confidence or belief to successfully implement the action required to achieve a specific goal. Therefore, because of the epidemic, teachers must effectively stimulate students' learning motivation during the online teaching as a result of Covid-19.

Four strategies to effectively stimulate students' learning motivation were employed in this Media Management.

One was to assign a specific task.

It is vital to make students aware of the significance of the course, helping them to realize that the course was not insignificant. In addition, students should be informed of the weight of the formative assessment index (see Table 3) at the beginning of the course.

Table 3. Index weight of formative assessment

Name	Student ID	Attendance16%	High quality online interaction 12%	Self-study video or video appreciation 10%	class assignment/ homework 16%	case presentation 46%

The second is to ensure that students could complete their tasks successfully.

The two-week course introduction acquainted students with the key words of media management, which were also the key words in information searching. Lectures on the chapters deepened student learning in conceptual cognition, cultivated student thinking abilities, and enabled them to extend their study by searching for relevant information. Constructive scaffolding ensured high quality online interaction and assignment completion.

The third was the belief in teamwork.

Considering varying student self-efficacy dependent on different tasks, teamwork was adopted in case study and case presentation.

Making use of team members' strengths produced profound case studies and good presentations, which trained students' data-retrieval capability, analytical and inductive ability in handling miscellaneous materials as well as their presentation skills.

The fourth was to encourage mutual help among groups.

Myers and Twenge (2016) concluded that many theories thought that helping could benefit both the giver and the recipient in the long run. In order to promote the behaviour of helping people, rewards were introduced into the evaluation system with reward points to the benefactors. Meanwhile, it was required that the recipients must express their gratitude to the benefactor in their presentation, which made it possible for sustainable support, information exchange, trust and cooperation among groups.

Teaching first and then group work & presentation

This course adheres to the concept of "teaching first" and conducts course introduction and classroom teaching first, so that students can master the basic knowledge points and lay a knowledge foundation for later group course assignments.

In the last 6 weeks of the semester, the six groups must work together to complete case studies on the operation and management of Chinese and foreign media companies and they are required to present cases in class. This is actually a form of cooperative learning. Traditional cooperative learning is face-to-face, but today, thanks to the development of science and technology, with the support of Internet technology, students can learn cooperatively even though they are far away from each other. Students need to develop their ability to seek new information by interacting with their classmates. Therefore, working with classmates is an essential part of the learning process. Effective group cooperative learning is an indispensable springboard for learning and mastering knowledge. Therefore, this course takes group cooperative learning as a teaching arrangement, that is, it gives 6~7 students the opportunity to cooperate to complete the case study, so as to develop cognition and understanding of each group on the operational behaviour of the case object and show it

to the whole class.

In group cooperative learning, we put forward five requirements:

1. Positive cooperation

As a Chinese saying goes, "When everyone adds wood, the flame burns high." Case studies of Chinese and foreign media companies require a heavy workload and require the full cooperation of each team member to ensure the completion of the learning task. Therefore, when forming a team, we should consider making effective use of the diversity of team members and try our best to ensure that each member can make his or her own contribution.

2. Positive interactions

In order to collect material without repetition, in order to integrate ideas and generate new ideas based on it, the group needs to engage in active interaction.

3. Identify individual and group responsibilities

When assigning homework to a group, students will be clearly told that the teacher will score the presentation and that both the individual and the group share the glory and the disgrace. The teacher will reward both the individual's contribution to the group and the efforts of the whole group, so the group members will get different scores. The relationship between team members and teams is coexistence and symbiosis. Through hands-on exploration, each member of the group has formed a number of heterogeneous connections with others symbiotic with the self, thus forming a community in which the self participates.

4. Seek outside help when necessary

Case studies on media companies involve a lot of knowledge in economics, management and finance, so students are encouraged to actively seek support from friends in relevant majors and give thanks in the PowerPoint presentations. We include a special reminder, here that "foreign aid" includes students in other classes, students from other colleges, students from outside this major. Groups that have included foreign aid support not only do not lose points, but also can gain points in the overall assessment.

5. Group leader responsibility system

Each group selects a leader to be responsible for the overall planning of the case study who is responsible for the whole case study and presentation. In this process, the leader's leadership and coordination ability developed and improved.

The new instruction design stimulated student learning motivation and activated their self-efficacy. Students formed a relatively clear understanding of the management via case study and key words and concepts. All forms of constructivism emphasize that learners construct knowledge through their own activities (Biggs & Tang, 2015). Students could construct a new understanding of concepts and principles based on their schemata. Teaching activities were no longer one-way knowledge transmission, but guided and involved students in active learning, which enabled a successful learning process.

From the initial knowledge receiver, information collector and information processor, students become the integrator and creator of knowledge, and successfully realize the transition from "primary learner" to "advanced learner".

3. Evaluation of the Media Management Course

Evaluation consisted of students' assessment and instructor evaluation given by students.

The evaluation for students' learning was composed of student attendance, high-quality online interaction, autonomous learning via video, class assignment and homework, as well as case presentation. Dingtalk revealed that student attendance for all students was above 92%, with 5 to 9 high-quality online interaction per week on average, the completion rate of autonomous learning was over 90%, and the completion rate of assignment and homework exceeded 80%. All the case presentations were conducted with depth and variety which were manifested in their abundant information, clear structure, and reasonable evaluation. It fully reflected students' remote response with highly activated self-efficacy during the epidemic period.

The evaluation of the instructor was conducted online by the teaching affairs department of the university. The scores of the three classes were 91.75, 89.86, and 90.33 respectively. The questionnaire survey of teaching effectiveness and students' comments also showed they were satisfied with the teaching.

4. Shortcomings

Teaching is a process in which teachers and students take the initiative to obtain information. Instructors convey information, help, and motivate students and student feedback helps instructors reflect on their teaching, which makes teacher-student interaction valuable. Still, several issues need to be considered.

One was not all problems could be addressed in a timely way because of the large quantity of online messages. An instructor could not spend every minute online checking all the messages, especially when each class size was too large.

The second concerned group work. Group work was designed to help all the members learn from each other and develop (Frey, Fisher & Everlove, 2016). But it resulted in different outcomes. In many cases, the members who were good at making PowerPoint were responsible for PowerPoint whereas the one who was good at expression was responsible for delivery. Not all members were involved in the group work. Low-quality presentation was a huge waste of time.

Besides, high attendance, low interaction, and freeloaders were some phenomena that deserved further attention. High attendance did not equal active participation in class. Some students logged in and were busy with other issues rather than attending to the course.

Solutions were provided in view of those problems in online teaching. One was providing online answering by assistants who are responsible for checking student attendance in class. Group work should involve all the group members in collecting data, producing PowerPoint, and presentation delivery. Asking students to answer questions randomly and inviting students to have video interaction during off-peak hours can enhance student participation

in class discussion. Presentation review can prevent low-quality case presentation and require students to rework their project. Teamwork log and personal work log can minimize freeloading and enhance student participation.

In conclusion, the teaching of Media Management was conducted online due to the pandemic. A brand-new instruction design with rich and practical teaching contents and formative assessment brought about transformations via Dingtalk. Khan (2014) stated that new technology not only made education more efficient, but also reduced the cost of education. The online teaching of Media Management is a telling example. By activating students' self-efficacy and motivation, remote responsive teaching did produce good learning and teaching results (Wang, 2015).

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Chapter 9

Chen Xiaoxin and Yang Yani

Exploration of online Teaching: Responses to the pandemic

In early 2020, the COVID-19 epidemic rapidly swept over many countries and regions in the world. According to the data released by the World Health Organization (WHO), nearly 20 million people have been diagnosed as COVID-19 patients worldwide and more than 14,000,000 people died by October 2020 (xwlb, 2020). The epidemic has changed people's lifestyle. In higher education, universities around the world have to change their teaching methods to online teaching. "Stop class but don't stop teaching and learning" is not only a slogan but also a chance for teaching reform.

1. Characteristics of online teaching

On the one hand, compared with traditional offline teaching, online teaching refers to the teaching method where the whole process of teaching is carried out in an online way. To achieve high-quality online teaching (multi-directional exchange and communication between teachers and students), it needs the teachers, the students,

the technical side and the network environment to remain stable throughout, and be able to exchange information in real-time. In this process, uncontrollable factors are more than that of classroom learning (Ling, 2020).

On the other hand, high-quality online learning resources are also an important feature of online teaching. Taking China as a case, more than 40,000 online learning courses were opened to college students, including IMOOC, SPOC, Rain Classroom, and so on (HZ, 2020). However, most of the online courses are professional basic courses with high repetition and lack of professional direction. In the process of learning, it's difficult for teachers to grasp the students' learning dynamics and accurately estimate the learning effect.

2. The design of online teaching scheme

As a new teaching attempt, online teaching has a significant impact on teachers and students. Each teacher shall cooperate with students closely to explore and try to find out a suitable scheme for each class and each chapter. An excellent online classroom requires the teacher to give mature consideration to all aspects of a question and cooperate with students. Taking the online teaching of finance in Spring, the design of the teaching plan mainly includes the following parts:

2.1 The development of online teaching

The sudden outbreak of the COVID-19 epidemic led to the rapid reform of the teaching model. My nine-week online finance course teaching can be divided into three stages: 1) exploratory phase (1-3 weeks). At this phase, teachers and students are curious about online teaching because they are all new to online teaching. Hence, it's very important for students' ideological work. Online teaching has brought great changes to both teachers and students. How to establish students' correct view of online teaching and learning, how to calm their emotions, and how to guide them into learning status quickly are the focus of the teachers' work. In this phase, teachers pay attention to try different online teaching platforms, conduct online

Q&A, analyze students' learning status, and evaluate and update the teaching process. The main task of students is to be familiar with all kinds of information tools and explore the self-study model. 2) adaptive phase (4-6 weeks). At this stage, both teachers and students become familiar with the learning tools of online teaching and start to regular learning. Teachers familiarize themselves with the teaching process according to preliminary exploration, online learning feedback, homework, and student evaluation. They pick up suitable online teaching tools, classify students, enhance interaction with students in addition to normal class teaching. Their teaching mode is becoming more and more proficient. Students have mastered the use of information tools for online teaching and the operation of various platforms. They gradually keep up with the teacher, interact, and give feedback positively. 3) Fusion phase (7-9 weeks). Teachers and students are in a period of exhaustion. Students begin to be tired of studying on computers or other multimedia devices. At the same time, the teachers are also weak because of students' negative feedback. At this phase, teachers start to change their teaching mode to arouse student's learning interest and promote students to return to the learning state by using a set of teaching links such as the flipped classroom.

2.2 Innovative methods of online teaching

Course outline: adjusting the course outline based on the new situation of online teaching and students' feedback. In the course outline, it should list the key and difficult points of each class, and clearly tell students the teaching plan and links of the whole course.

Student grouping: dividing students into groups and making sure there are different levels of students in each group according to the students' situation. The related literature or video of the class will be sent to the students before each class. Then, the group leader is responsible for organizing reading, watching, and discussion. In each class, different group members will make speeches to summarize the group's views. For instance, when talking about budget, the teacher will distribute the budget implementation and draft budget of the Ministry of Finance in 2018 and 2019 to compare the differences. On the scale of the government budget, students are recommended

to read a series of articles on the exploration and evolution of China's budget in the 70 years since the founding of new China.

The flipped classroom: it is particularly important in online teaching. Different from offline, due to the lack of interaction between online teaching teachers and students, it is difficult for teachers to obtain feedback from students in the class, which reflects the importance of the flipped classroom design. In the process of teaching finance, the author will take 30 minutes for the flipped classroom in a 90-minutes class, including debates on teaching content design, such as "Whether the Chinese government should implement zero-based budget?"; In case study teaching, students are required to look for cases related to the class and share them in class. Students are randomly selected to evaluate the cases.

Curriculum design: it consists of three modes: pre-class, in class, and after class. Pre-class generally refers to the self-study stage. Teachers send the preview to the students, like MOOC video, learning guide, study assignments, etc. Students shall complete pre-exercise and give feedback by groups; Classroom design is mainly composed of online explanation, the flipped classroom, discussion, and feedback. First of all, the teacher will guide the students in teaching, lead to the teaching content, and emphasize the learning objectives of each class. The flipped classroom: students communicate with each other according to the tasks assigned by the teacher and the preliminary preparation. Group discussion: the teacher recommends group performance and puts forward some feedback. Teacher commenting: the teacher shall comment on students' performance, homework, etc.

3. Problems in online teaching

Online education is quite different from traditional education in terms of classroom teaching feedback, teaching activity cost, second classroom teaching, and assessment system. Online education also has the following problems:

3.1 Relatively poor classroom teaching feedback

In the traditional university classroom, teachers and students

communicate face to face. The students' learning situation can be fed back to the teacher directly. Meanwhile, the teacher can adjust the teaching according to the students' situations. For example, When students are confused about a knowledge point, the teacher can give a solution in time. Nevertheless, it's very hard for the teacher to get feedback from students at the other end of the screen and update the teaching process timely when adopting online teaching (Wei & Hui-Min, 2020).

3.2 High cost of teaching hardware

Traditional teaching hardware facilities include classroom, multimedia, computer, desk and chair, and other basic teaching equipment. Online teaching increases the demand for a lot of hardware equipment and network environment, as well as a great deal of time to upload and download homework. Not only that, we need to ensure that every student has a stable network environment to learn online and download network resources. Online teaching has higher hardware costs than in traditional teaching situations, such as platform building, knowledge system building, course management, traffic carrying, and so on (Xinjie, 2020).

3.3 Deficiency of the online classroom teaching

Unlike traditional secondary education, at college level education, students need to cultivate their own communicative ability and organizational ability through the online classroom teaching, community interaction, and social part-time job in addition to master the necessary knowledge. Influenced by the epidemic regular classroom activities are basically cancelled. Activities are basically broken off. Students have no other activities except online courses, which is not conducive to the overall development of students (Ling, 2020).

3.4 More difficult design of teaching assessment

The assessment of online teaching is more difficult than the traditional assessment method. On the one hand, it is difficult for teachers to judge whether the students listen to the class and study seriously from the background data. On the other hand, it's hard to supervise whether the students answer questions honestly in

terms of assessment. Besides, teachers fail to assess and carry out a quantitative evaluation of teaching quality on courses with high requirements like design and experiment (Wei & Hui-Min, 2020).

4. Countermeasures to the problems existing in online teaching

4.1 Diversify the teaching links to increase the frequency of students' interaction

In the online classroom, it extends the time of the flipped classroom and designs diversified teaching links. Through group discussion, case analysis, questioning, and other methods, students are required to take part in discussion and interaction all the time. Concurrently, after each class, students are randomly selected to answer questions about the course content, so as to understand the degree of students' knowledge mastery of the course and improve their concentration (Xinjie, 2020).

4.2 Optimize the teaching platform and improve the efficiency of the teaching platform

Affected by the epidemic, students from all over the country are taking online classes. Due to the sudden increase of visits, the online teaching platform often appears to be stuck or even paralyzed. Therefore, network communication companies should optimize the network speed. Moreover, the management of the teaching platform should be standardized. Teachers of the same major should try to use a unified platform to avoid teaching confusion caused by too many platforms (Xinjie, 2020).

4.3 Exploring effective models to enrich online teaching activities

It is necessary to enrich online teaching activities using information technology. In addition to increasing teaching resources and enhancing teaching methods, teaching activities should also include other student activities, such as online fitness, online subject competition, etc., to enrich students' after-school life and increase enjoyment in learning.

4.4 Reform the traditional assessment methods and adopt various assessment methods together

Compared to traditional assessment, for online teaching assessment, it is more important to ensure the academic integrity of students. Replacing the traditional one or two assessment systems with continuous assessment can not only ensure the quality of assessment but also improve the participation of students in the whole course. Furthermore, practical ability examinations should be increased and open book subjective tests are an effective way that better reflect students' understanding of knowledge rather than traditional paper exams based on the text.

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Chapter 10

Shaoying Wu

Online teaching under the epidemic: Dilemmas and suggestions

In late January and early February 2020, the Ministry of Education in China issued a series of suggestions on postponing the spring semester and implementing online teaching in colleges and universities (Press Conference, 2020). Based on those instructions, universities formulated their own policies regarding the operation of the spring semester. In order to maintain the normal teaching order, colleges and universities had launched large-scale online teaching, instead of canceling classes. According to the report from the Ministry of Education, by May 8th, 2020, 1 454 universities in China had launched online teaching; 1.03 million teachers offered a total of 1.07 million courses, including both theoretical ones and experimental ones; 17.75 million college students took part in online learning (Department of Higher Education, Ministry of Education, 2020).

It is worth noting that online teaching is a broad phrase. Before the epidemic, most analyses and reports on the online teaching industry in China tended to start with the business models, namely

business-to-business(B2B), business-to-consumer(B2C), consumer-to-consumer(C2C), and online-to-offline(O2O)(Qiao & Ma, 2020). However, online teaching in the university triggered by the epidemic was different. Universities treated it as an alternative to classroom teaching. Under such circumstances, besides delivering knowledge, teachers taught online to accomplish teaching tasks not to earn a profit; students took the class because it was required for the spring semester not because of their personal interest and they paid no extra fees for online learning. The initial purpose was to fulfill the teaching plan for the spring semester. To achieve such a goal, the online teaching modes carried in university included live courses, recorded courses, MOOCS, distance guidance, and other forms.

At the University of Sanya, the extensively used teaching mode was live courses. For the sake of receiving feedback on the implementation of online teaching and to provide a reference for future improvement on teaching models, in March 2020, the University of Sanya conducted a survey of both students and teachers involved in online teaching, collecting back 14871 questionnaires. The overall attitude towards the effect of online teaching from both teachers and students was positive. And based on student feedback, schools whose faculty were more familiar with modern technology and students' minds and behaviors revealed achieved higher performance in online teaching. The survey asked both students and teachers to rate the performance and experience of online teaching. The result from SF Business displayed coherence, as the students gave an average score of 7.89, the highest score of all schools, and the teachers 7.89, ranked the 15th.

2. Advantages of online teaching

SF Business School, which was established in 2018, received in total of 111 valid results back. Around 60% of students and teachers believed the online teaching was a substitute action, which would not replace offline education shortly; more than half were confident that online teaching was the trend due to the development of society and technology. Around 20% of the students preferred to have more

time learning online than offline once the campus reopened.

Based on the analysis of the results of the survey, interviews with teachers and students participating in online teaching, and online teaching practice, this paper summarizes following advantages of online teaching.

2.1. Reducing limit on where to learn

Online teaching broke the limit in space, regardless of the modes or forms applied (Shen, 2020). Teaching and learning went beyond the classroom and allowed users to utilize fragment time, which had already been the well-known selling point before the pandemic. Thanks to online teaching, students were not prevented from learning while following government instructions to keep social distance and stay at home during the lockdown. The development of telecommunications technology made it possible to access online learning even in remote areas.

However, as the breakout of the epidemic was unexpected, where people stayed during lockdown affected the teaching and learning effect. eople staying in rural areas or at their relatives' house while celebrating the biggest festival - the Spring Festival had not brought large-screen devices with them. According to the survey, teachers had a higher percentage of staying in an urban area than students. Not all students studied by computer or laptop; nearly 30% of the students used mobile phones only, and these students expressed their inconvenience for finishing learning tasks.

2.2. Flexible time to learn

Most of the online teaching platforms allowed users to record the screen sharing and speaker's voice so that students could replay the videos and review the part that confused them during the class. Over 70% of teachers and students believed the recordable and reviewable functions enlarged the boundaries of teaching, providing flexibility to learning. However, more people needed this function than used it. According to the platform data on Financial Market, on average less than 5% of the students played the recording back one week after the course; the viewing ratio increased when the deadline of assignment or final examination approached.

2.3. Private learning environment

Online teaching relieved students from the psychological pressure of being with classmates and teachers. Some students hesitated to share their opinions and raise questions during the class, as they were afraid of catching the attention of students and teachers. And some students were easily distracted by other students' behavior. However, the interaction of online teaching was behind the screen, receiving no facial expression or interruptions from others. More than half of the students selected independent learning space as the advantage of online teaching.

3. Difficulties and Challenges

Compared with traditional classroom teaching, online teaching has considerable differences in many aspects, such as teaching content, method, form, means, and technology. Therefore, along with the unforeseen transfer from facing students to facing screens, teachers found difficulties and challenges unavoidable.

3.1. Little knowledge and experience about teaching online

Online teaching created physical distance between teachers and students, teachers and teachers, students, and students, creating an unfamiliar teaching environment for teachers. And most teachers are confronted with problems such as how to organize teaching activities, how to deal with application operation problems, what teaching software fits the course best, and how to interact with students online, etc.

First, teachers varied in accepting and digesting the change from teaching offline to teaching online. To carry out online teaching, teachers had to seek the help of new teaching technologies and applications, which demanded extra time to explore. A large percentage of teachers agreed that online teaching required more effort and time to deal with technical problems in addition to the regular preparation of teaching content.

Second, teachers lacked online teaching experience. According to the survey, more than half of the teachers had no online teaching experience. Even for the rest who had such experience, they were using MOOC with recorded materials, not live ones. With limited time dealing with the unforeseen transfer, some teachers naturally duplicate the way and model of teaching offline to online, thus affecting the teaching outcome (Li, Liu & Nie, 2020).

Third, the pace of online teaching was difficult to control. Normally, teachers adjusted the pace and content according to students' timely response, such as facial expressions, body language, and facial expressions. Moreover, some teachers presented courses in the form of theory combined with cases, discussions, and presentations, etc., which required high interactions between students and students and between students and teachers. While teaching offline, during the class, controlling the information delivered and adjusting the pace based on students' feedback was not complicated. On the contrary, it was difficult to collect a timely response from students in online teaching was difficult to collect a timely response from the students, thus bringing uncertainty to the class.

3.2. Insufficient online teaching resources

To support universities to teach online, the Ministry of Education opened more than 24,000 free online course resources to college students across the country. However, those programs were incapable of covering all the courses and meeting all the demands of teachers and students.

For instance, new courses had few materials online. Generally speaking, the maturer a subject was, the more open courses resources with better quality were available. Furthermore, among the existing online teaching resources, courses that required practice and face-to-face instructions and guidance had less advantage over the theoretical subjects. Therefore, a course like Accounting Information System, which was easier to manage in the school's Accounting and Finance Lab, was challenging to ensure the teaching effects online. Additionally, the quality of existing online teaching courses varied. Some teachers built online courses in a short time without thorough deconstruction of subject knowledge. And the

platforms barely implemented selection and supervision on courses posted online, leading to deficiencies in the early stage of online teaching and difficulties to guarantee the teaching quality.

3.3. Immature development of the platform

Teaching platforms played the role of carriers of online courses, and the performance of teaching platforms directly affected the teaching effect. The immature development of the platform influenced online teaching in the following aspects.

First, some platforms were short in capacity and stability to support a large volume of users running at the same time. According to the survey, more than half of the teachers had different degrees of slow connections and frozen images, and some of them were even confronted with system breakdown. At the beginning of the spring semester, universities reacted promptly to teaching online by suggesting platforms and software to teachers; however, teaching platforms were not prepared to deal with a national-wide teaching online activity. A platform like Xuexitong, which used to be smooth in delivering the online course, received plenty of complaints from teachers because of the system crashing.

Second, platforms operated independently and were not compatible with each other. Though universities provided suggestions on certain platforms, teachers tended to select the platforms that were most suitable for their needs. According to the survey, students installed at least four different teaching platforms, and 95% of students were disgusted with the frequent switch of teaching platforms.

Third, platforms could not provide sufficient functions demanded by teachers. A platform like Yuketang, which used to bring convenience for teachers to have interaction during the class, offered a live online teaching function as well but was discarded by teachers because of the two-month identity approval. Moreover, the backstage data reports lagged behind the need. Unlike the MOOC platform, which displayed detailed information on students' learning habits, a platform that supported online teaching presented only the regular attendance information, such as time logged in and duration of staying in the platform for each student. But it could not collect the

questions typed by the students and in-class test result, etc., which were helpful and constructive feedback on teaching effect to teachers.

4. Suggestions on future development of online teaching

Before the pandemic, online teaching in China had remained in the primary stage of digitizing teaching resources and bringing teaching activities online. Most universities and teachers and students treated online teaching as a supportive action. Triggered by the quarantine and social distance requirement, the development of online teaching practice accelerated. As the coronavirus would remain in continuous influence on the world, it is inevitable to explore future teaching models in which online teaching plays a crucial role. And to achieve positive teaching outcomes it requires cooperation involving teachers, platform developers, universities and government.

4.1. From the teachers' perspective

First, teachers shall be selective on the content, as the teaching content is the cornerstone for the implementation of an online course. And the content shall be designed according to the characteristics of the course, needs of students, and teaching objectives and shall conform to the cognitive level of students (Li, Liu & Nie, 2020). And the nature of the courses decides the degrees of difficulty to put online, thus 'requiring teachers to be prudent about content selection to be presented online and about the forms of presentation.

Furthermore, online teaching required cooperation among. To open an online course is easy, however, to have a well-built course is not, for it is not a duplicate of an offline class. Online teaching is a systematic project, which sets high requirements on teachers' teaching ability, research ability, and information technology level, etc. It will be better to be completed by a teaching team. The team leader, who has rich teaching and practical experience, mainly takes responsibility for the control of the contents. Other members in the team shall also be teachers in the same or related fields with years of teaching experience, including the ones who are good at interacting with current students, and the ones who are competent in technological knowledge. A team like this would know how to design an online course beyond students' expectations. In addition,

teaching assistants, who can help to answer questions, check homework, and analyze students learning behavior, are necessary.

4.2. From the platform developer's perspective

First, platforms shall guarantee the basic function required by users. Online teaching platforms bridge teaching and learning. A prominent platform shall not only possess a user-friendly interface, but also maintain three main functions, including a high-quality teaching resource pool, unhindered live teaching and interactive support, and detailed data report. This is necessary so that it can meet the needs of students to learn smoothly anytime and anywhere, and meet the needs of teachers in delivering information, real-time control and after-class analysis of students' learning activities.

Second, platforms shall provide tailored service to universities. In the market, most teaching platforms, such as Zhihuishu and Tencent Classroom, were created by profit-making companies; only a few were supported by universities, for instance, Xuetangzaixian and Yuketang by Qinghua University. Generally speaking, the university alone can hardly develop the platform. And even Qinghua University, one of the top five universities in China, gained strong financial support from the Ministry of Education. It is unnecessary for each university to develop its own platform. And it is not contradictory for teaching platforms and universities working together on optimizing the platform. For instance, platforms can create for universities a one-to-all login window directed to different platforms, which in jumping from one platform to another. Moreover, it is recommended that an online platform permits teachers in the same subject to add more information and studying modules. Open programming will allow teachers from different universities to optimize the course, thus benefiting learners in the end.

Third, platforms shall improve data support. As thousands of universities and millions of students are learning online, the data behind the platform is immense. Currently, several platforms in China allow teachers to view data regarding the course they are teaching, such as grades, error rate, completion status, and response time, etc. However, none of the platforms gives consent to download data from other related courses, which may contribute to research

on course comparison, selection, and customization. Furthermore, with the progress of artificial intelligence technology, platforms can collect data in various ways, rather than by typing and clicking from the users. For example, on the condition that the platform gained users' permission on collecting data from the camera, the platform can collect and process facial expression data of students and then report on their in-class performance.

4.3. From the university's perspective

Designing and managing an online course is a demanding job. Increasing supports from universities can boost teachers' morale.

First, the university shall improve the teaching assessment and incentive mechanism, encouraging teachers to explore new technology and teaching methods and to experiment with the combination of the online and offline teaching model that is customized to their courses and students. At present, there are many online courses offered by colleges and universities, which may be a positive sign that teachers are enthusiastic about embracing new teaching approaches. However currently teachers are not required to complete the task of developing the online courses and developing the skills to teach them effectively. The quality of online courses provided by teachers who made a perfunctory effort is unreliable. Considering that the core curricula of one major in different universities are similar and top universities already took an early step in building online resources, it would be more efficient for teachers to take advantage of existing resources than imposing on them to make their own. Teachers can instruct students on the usage of such resources and spend more time for mind inspiring and practical activity.

Second, universities shall establish or improve the technical support and assistance to teachers (Liu & Sun, 2020; Xie, 2020). A department that keeps updates on the latest technology and platforms and software applied to teaching and delivers that information to teachers is necessary. Such a department can organize regular training programs for teachers in need, offer guidance in solve technological problems, host seminars for teachers to communicates and exchange ideas on certain topics, and publish the results in brochures or in

digital forms.

4.4. From the government's perspective

Even though the development of information technology enriches educators with reflective and invaluable information, the importance of information security cannot be overestimated. The government should create restrictions to protect the information security of users.

5. Summary

The purpose of this paper is to discuss the difficulties of online teaching and explore possible endeavors for future development. However, this paper failed to build statistical relations between factors and to infer the survey results to other privately owned universities nor to make comparisons among universities on a different level, which worth future analysis.

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