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HIGHER EDUCATION IN HUNGARY IN THE TIME OF THE PANDEMIC

ABSTRACT

In the spring of 2020, the coronavirus pandemic presented the world with new challenges. In the first half of March, parallel to the spread of COVID-19, teaching and lecture halls, colleges and other facilities in universities and university campuses were emptied almost simultaneously. Almost overnight, all higher educational institutions switched from face-to-face teaching to online teaching, namely absentee or distance learning. In our study, we surveyed students (both Hungarian and English-speaking students) and higher education faculty at the end of the second semester of the 2019/2020 academic year to explore their experiences with online education during the pandemic. In our analysis, we explore some aspects of distance learning during the pandemic that we consider important, and we seek to compare the student and teacher views. The results show that the introduction of fully online teaching during the pandemic was relatively smooth, but this period was not without challenges and difficulties that manifested themselves in the learning and teaching process, in the availability of learning materials, in the digital skills of students, and in the work overload of teachers. In summary, however, the response of higher education to digitalisation today, besides its inevitability, is to prioritise the incorporation of past experiences in determining the focus of further development.

Keywords: *higher education, digital education, online education, empirical examination, pandemic*

VISOKOŠOLSKO IZOBRAŽEVANJE NA MADŽARSKEM MED PANDEMIJO – POVZETEK

Spomladi 2020 je pandemija covida-19 svetu prinesla nove izzive. V prvi polovici marca so se izpraznile učilnice in predavalnice, fakultete, kampusi in drugi univerzitetni prostori. Skoraj čez noč so visokošolske ustanove morale narediti prehod na izobraževanje prek spleta, torej na daljavo. Prispevek predstavlja rezultate raziskave, ki je bila ob koncu drugega semestra šolskega leta 2019/20 opravljena med (tako madžarsko kot angleško govorečimi) študenti in visokošolskimi učitelji o njihovih izkušnjah s spletnim izobraževanjem med pandemijo. V analizi se osredotočamo na nekatere vidike izobraževanja na daljavo, ki se nam zdijo še posebej pomembni, primerjamo pa tudi poglede študentov in učiteljev. Rezultati kažejo, da je prehod na povsem spletno obliko poučevanja med epidemijo potekal relativno brez težav, vendar pa to obdobje ni bilo brez izzivov v procesu učenja in poučevanja, dostopu do učnih gradiv, pri digitalnih kompetencah študentov in preobremenjenosti učiteljev. Kljub temu je v visokem šolstvu odnos

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do digitalizacije danes, poleg tega, da je ta neizogibna, osredotočen na prednostno nalogo učenja iz preteklih izkušenj pri določanju prihodnjih usmeritev.

Ključne besede: *visokošolsko izobraževanje, digitalno izobraževanje, spletno izobraževanje, empirična študija, pandemija*

INTRODUCTION

The coronavirus pandemic posed new challenges for the world in spring 2020. In the first half of March, in parallel with the spread of the pandemic, teaching and lecture halls, colleges and other university institutions as well as college campuses were emptied almost simultaneously. Almost overnight, all higher education institutions switched from attendance education to online, absence or distance education (Gonda, 2020)

The pandemic has certainly accelerated the use of online tools in education, but the expansion of digital education has been an important task in education for more than a decade. The education system faced challenges not only in Hungary but all over the world. However, higher education institutions were in the best situation among the actors in the education system, as this was not without precedent for them, and distance learning in higher education could already serve as a precursor and experience for the rapid transition in any form. The aim was given: a smooth return to education as soon as possible, where, considering the preparedness and assistance of the students, the educational technology had to be considered, since the success and professionalism of the previous lecture hall/classroom education had to be ensured for the students, but neither could the educational methods, the tools and the technological preparedness of the instructors be ignored (Bacsa-Bán, 2021).

LITERATURE REVIEW

The digital transformation experienced over the last few years has transformed society and the economy and is having an increasing impact on everyday life. However, before the COVID-19 pandemic, digitalisation had a much more limited impact on education and training (International Association of Universities, 2020). Overall, we found that the pandemic has demonstrated that an education and training system that is appropriate for the digital age is essential today. While pointing out the need for a higher level of digital capacity in education and training, it has also amplified several existing challenges and further increased the existing inequality between those who have access to digital technologies and those who do not (European Union [EU], 2021).

The pandemic has posed even more challenges for the education and training systems in relation to the digital capacities of education and training institutions, of teacher training as well as the overall level of digital skills and competences (Benedek, 2020). According to a 2019 study of the OECD, on average less than 40% of educators in the EU felt

sufficiently proficient in using digital technologies in teaching, but there are differences between EU Member States in this respect. In an International Computer and Information Literacy Study (ICILS) (National Center for Education Statistics, 2019), more than a third of 13–14-year-old participants did not have the most basic level of proficiency in digital skills. Furthermore, a pre-pandemic study found that a quarter of low-income households do not have computers and broadband internet. In this respect, there are differences all over the EU depending on household income (Eurostat, 2020).

The pandemic has accelerated the direction of development of the education system towards online and hybrid learning. And this change has also revealed new and innovative ways for students/learners and educators/trainers to organise their educational and learning activities and to communicate on the internet in a more personal and flexible way (Szűts, 2020).

These changes require strong and coordinated efforts at EU level, as recognised and formulated by the European Commission in the Digital Education and Action Plan in 2021 (EU, 2021).

Digitalisation has become one of the most explored topics of the last two years, not only in education, but also pervading many areas of science and social analysis. Numerous publications, workshops and conferences have been held on the subject and it is right to express concerns about whether it is still possible to say, create or show something new in this field. Yes, it certainly can be possible, because it has affected each sphere in a different way, and one of the most important topics of our present discourse is how to continue, what is it that can be taken forward from digitalisation, and what makes us, the actors of higher education, predestined by the digital education (Bereczki et al., 2020; Hargitai et al., 2020; Námesztovszki et al, 2020; Sipos et al., 2020).

New concepts have also been created or highlighted during the pandemic (Námesztovszki et al., 2020; Sipos et al., 2020). Distance learning or online education was introduced into education; however, the two concepts are somewhat different, and it is also worth separating their foundations if we focus on the role of the educator.

Distance learning is a form of education in which teachers and students are not in the same location. Students study alone, independently for most of the training period, and take part in consultations for a shorter period. The courseware for home study is offered by educational institutions to students, while during consultation – where any form of contact can be used, from face-to-face meetings to the internet to telephone, etc. – the student deepens his/her knowledge gained during self-study. So, in this case, education takes place by bridging some distances, so students must learn how to learn independently. Only those students who can adapt to this new role, have the proper motivation, are ready to continue their studies, and can take full advantage of two-way communication will be successful in distance learning. The role of educators must also be reconsidered as students are now at the centre of the learning process, while teachers become guides and helpers (Gonda, 2020).

Online education is distance learning too, but in this case simultaneity and synchronicity are the focus. Teachers and students are together in real time using software and IT devices (laptop, tablet, mobile phone, etc.). In addition to presentations, there are opportunities for comments, questions, project assignments, discussions, additional films and videos, task solving, group work, and more (Gonda, 2020).

Distance education introduced in higher education is somewhere in between: it is a hybrid form of education. The fact that it attempts to implement e-learning-based distance learning without a physical presence offers many opportunities but of course also has its limitations.

As opportunities, we can mention the following: flexibility in time; it is not linked to localisation; allows the development of individual learning paths; cost-effectiveness; owing to the micro-contents, it supports the filling-in of dead times and can be studied and completed even in smaller units; supports the creation of recorded courses that can be retrieved later; supports the planning of transparent and recorded learning processes; supports the breaking of geographic limitations and the creation of virtual learning communities.

The following can be considered as limitations: low level of digital proficiency of the instructor and/or student; lack of equipment; lack of personal, direct contact; skill development and practical training involves more investment of time by the instructor (Bereczki et al., 2020).

All higher education institutions experienced this period differently, they had different starting points and foundations for their educational system and online education, which also meant countless solutions and related routes for digital education (Perényi, 2020; Serfőző et al., 2020). For the rest of our study, we would like to summarize the experiences of a Hungarian University of Applied Sciences.

THE CASE OF A HUNGARIAN UNIVERSITY OF APPLIED SCIENCES

The University of Dunaújváros (UOD), being the one and only higher educational institution in a dynamically developing town in the centre of Hungary, plays a leading role in the higher education of the region. Currently there are about 1500 students studying at UOD. The University of Dunaújváros has seen rapid development during the past few years and has launched foreign language undergraduate and graduate education for students enrolled in different Engineering and Communication programs.

Since the 1990s the UOD has been conducting metallurgical and mechanical engineering, technical management, engineer-teacher training, and information technology courses. At the beginning of the 2000s communications and media studies became available as well.

Our students can choose from about forty specializations of nine basic majors during full-time and part-time study in the Hungarian language. Some programs are also offered in English, including the Technical Management BSc, Engineering Information Technology BSc, Business Administration BA, Communication and Media BA, Material Engineering

BSc, Mechanical Engineering BSc plus MSc, and Engineering Teacher MA programs, for instance (UOD, n.d.).

The University of Dunaújváros has been developing the conditions for online and digital education for years to increase the number of distance learning students and to support student success (Szabó et al., 2017). Online education received a lot of attention from both teaching colleagues and students during the university's trainings. Nearly 10 years ago, the University of Dunaújváros established its own organisational unit called Online Studium, which is responsible for the development of online educational content. Owing to this, for more than 100 subjects, fully online courses are available to students. In addition to the fully online courses, the University of Dunaújváros has also been using the Moodle e-learning framework for years to support traditional education (UOD, 2020).

In line with these foundations, the transition to absence education took place relatively smoothly and quickly in March 2020, but it also posed a challenge to all actors, not only in terms of teaching methods but also of new educational opportunities and opportunities offered by the technology, as well as the imposed constraints (Rajcsányi-Molnár & Bacsa-Bán, 2021).

For nearly a decade, our institution has flagged the promotion of student success, which has meant many steps towards reducing student dropouts, as well as towards student mentoring, the establishment of a specialist mentoring system, the possibilities offered by a monitoring system for teachers and students, and training programs for trainers. In addition to quality online education, we also considered the success of students and wanted to continue to support this, and, as a result, we sought out long-term opportunities for incorporating the experience of digitalisation into our education system. In other words, we have set ourselves the goal of finding the place, role, and weight of digital education within the traditional education system.

METHOD

Our research, which took place in the second half of the 2019/2020 academic year among students and teachers of our higher education institution, was carried out with the help of a mirror questionnaire, i.e., in countless cases we sought to get an answer to the given question from both teachers and students, looking for a comparison of how the two most important actors of education experienced online education, giving guidance on how to incorporate these experiences in the development of the system. The latter was confirmed also by the United Nations Educational, Scientific and Cultural Organization's (UNESCO, 2020) call formulated within the framework of the programme Memory of the World (MoW), in which the organisation called on institutions from countries all over the world to better document and preserve data and documents related to the COVID-19 pandemic. In addition to gathering experiences and addressing problems, it was the contribution to this goal that launched the summarizing of the experiences of online education in our institution.

Research questions

Our research questions were as follows:

R1 – How did/do the lecturers and students at the University of Dunaújváros relate to online education?
R2 – How have our students and educators experienced digital education?
R3 – What difficulties and problems did they face?
R4 – How do they see the future of online education?

Sample

Student sample

The population of the study was 1134 Hungarian and 167 foreign students active in our institution in June 2020, and besides this, the 125-person active teaching base. Based on the returned answers, our sample was as follows: our questionnaire was filled out by 223 of our Hungarian students and 29 of our foreign students, which means a total of 19.3% survey, while 43 of our instructors responded, resulting in a 34% survey. From the comparison of the population and the sample, we can conclude that the sample represents the entire multitude well in several respects. In terms of the distribution by gender of the population and the sample, women showed a higher willingness to respond among Hungarian students, so their number is higher in the sample (34.7%) than in the population (25.1%); at the same time, in the case of foreign students, the sample represents the population well. In terms of the distribution by study section, we can speak of a representative sample since the population and the sample displayed the opinions of full-time and correspondence students in almost the same proportions. The sample follows the proportions of the population in the field of majors as well as in terms of training levels. Looking at the age distribution of our participating students, the highest proportion, 46.43%, were 18-25 years old, followed by those aged 26-35 (30.16%) and 36-45 years (17.06%), with the lowest number of people aged 46-55 (6.35%) in our survey.

Teacher sample

In terms of distribution by gender, 45% of the surveyed teachers are women and 55% are men. In terms of their age distribution, our responding teachers follow the curve of normal distribution, shifting toward higher age groups. Most of them are in the 36-45 and 46-55 age groups. In terms of their position, the same number (29-30%) was answered by teaching assistants and associate professors, while a smaller number (14-15%) was represented by assistant professors and college/university teachers. In terms of their fields of study, the surveyed colleagues represent primarily the fields of social sciences (25%), engineering (19%), and economics (16%) in accordance with our training/specialisations. Our surveyed colleagues taught this semester mainly at the BA/BSc level (54%) and at the MA (19%) and higher vocational education level (21%).

Instruments

During the study, we compiled an online questionnaire for both students and teachers at the university. When we asked these questions, we aimed to make a full-range questioning: we contacted both students and teachers with the help of the Neptun information system data register via e-mail, where they received the link to our online questionnaire, which we supported with our personal e-mail.

The questionnaire questions had the following structure:
- the student/instructor's prior experience with online education,
- the experience of online education during COVID-19,
- the future of online education,
- background variables.

The questionnaire was prepared in Hungarian and English. In the case of the English questionnaire, a correct language adaptation was made. Students/teachers had 2 weeks to complete it during the exam period of the 2nd semester of the 2019/20 academic year, when the experience of online education was still fresh for the respondents.

RESULTS

We will try to present the results of the investigation based on some of the aspects that are taken out of place but are important for online education, displaying both the student and the teacher side. Only the questions that were examined from the perspective of both groups were included in the analysis of our present study.

Level of digital competences of the respondents and their encounter with online education

Our surveyed teachers evaluate the level of their own digital competences as follows (Table 1). In terms of information search, the majority consider themselves master-level users, while in other areas they mostly consider themselves to be independent users. They are most unsure about online problem solving; some of them have no problem with this, while about the same proportion were those who have only basic knowledge here.

Table 1
Level of digital competence of teachers

	Basic level user	Independent user	Master level user
Search/processing of online information	2	18	23
Creation of online content	5	23	14
Online communication and cooperation	2	23	18
Online problem solving (in case of technical problems)	14	15	14
Online safety (e.g., data management, etc.)	13	21	9

In the case of our students the same question developed as follows: a significant majority, 59.92%, consider themselves experienced users, 22.62% of students call their level of digital competences average, and nearly 15% consider themselves professional.

A significant majority of students have already used a form of online education, most notably the Moodle interface, which our institution introduced in its trainings very early, already in 2012. But some of our students had not yet engaged in online education, mostly first-year and distance learning students. It was immediately stated here that introduction to online education was essential for first-year students and especially for distance learning students.

Many of the online forms of education have long-term traditions in our institution, so when asked what online educational activity they have regularly carried out in the past, a large majority of our teaching colleagues answered that these were their previous online teaching experiences, either in the form of contact lessons, exams, or consultation classes.

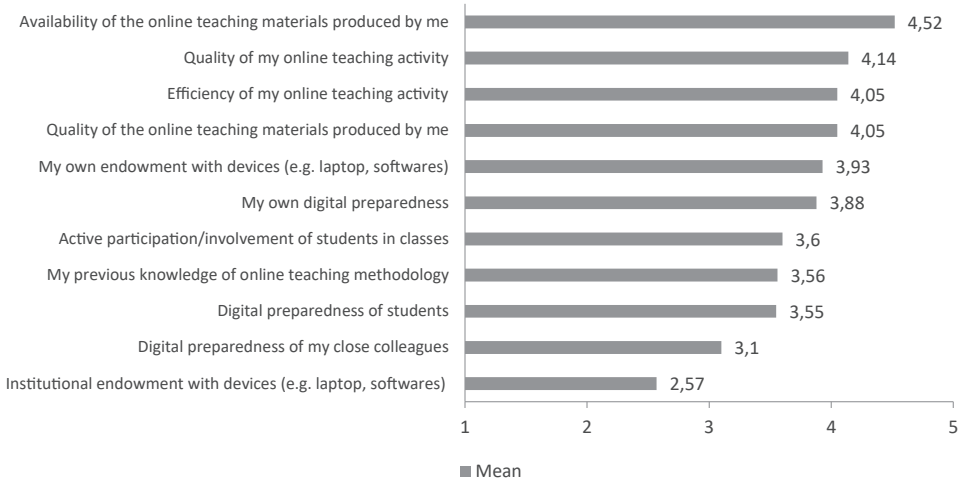
One of the outstanding aims of our study was to examine the effects of the state of emergency to our online education and digitalisation at the university. It was therefore important to see the daily burden this activity meant for both our colleagues and students. We found that in both groups, the majority spent more than 8 hours a day working in the digital space, and it was only a very small number for whom this represented only 3-5 hours of online activity. It was also important for us to find out whether the daily duration of their activity spent in the digital space for learning/working has changed compared to the period before.

About 50% of students reported an increase, while all the teachers reported an increase in online work. Generational differences are certainly also the cause of the change in students' online living space over time, but it also indicates that the workload of teachers has increased dramatically.

Experience concerning online education

In the following, we asked our instructors to evaluate their experiences and impressions of online education in some respects (Figure 1). The availability of their own curricula, the quality and efficiency of their online education obviously have come in first place. Unfortunately, the point of the institutional asset provision and the digital preparedness of staff and students were ranked last. Upon these experiences, we took several measures already during the semester, such as appealing for the help of pattern courses and digital competence training courses at the university.

Figure 1
Teaching experiences/impressions connected with online education



Note. Participants responded to the following statement: "Please evaluate your impressions and experiences gained during the semester during the state of emergency on a scale of 1 to 5 in the following areas"; (1=insufficient; 5=excellent).

Our students were able to evaluate the experiences of the semester in relation to digital education by giving grades (Table 2), and in this evaluation, of course, their own endowment with devices was given the best grade, together with their digital preparedness and the endowment with online learning materials. The average given grade of 4.07 can be considered a very nice result on a scale of 1 to 5.

Table 2
Assessment of the student experience of the semester in relation to online education/training

	M	SD
Digital preparedness of teachers	3.74	1.049
Digital preparedness of fellow students	3.80	0.902
My own digital preparedness	4.16	0.902
Institutional endowment with devices of the University of Dunaújváros (e.g., assurance of interfaces)	4.00	1.016
My own endowment with devices (e.g., laptop, smart phone)	4.56	0.752
Quality of online teaching materials	3.78	1.073
Availability of online teaching materials	4.07	0.999
Efficiency of online teaching materials	3.64	1.256
Quality of online teaching materials	3.67	1.184

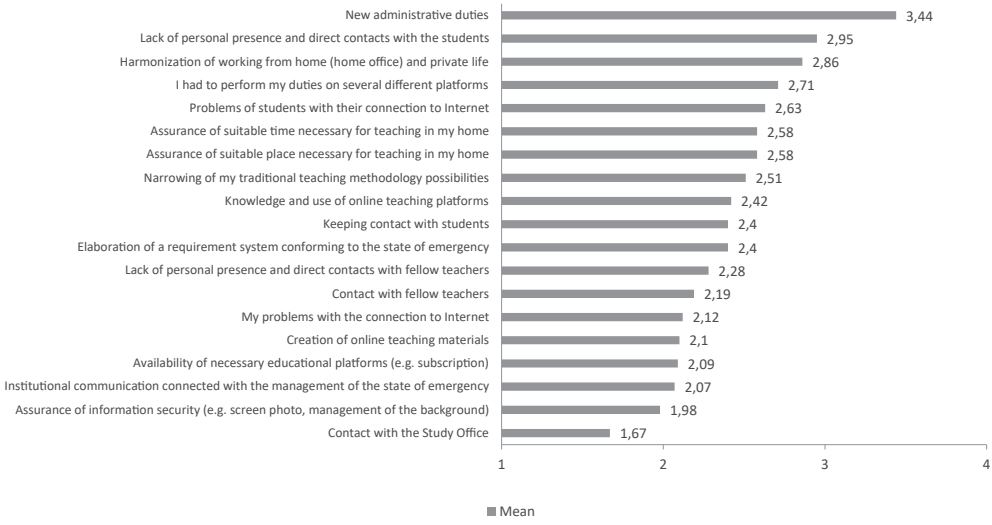
Note. 1= insufficient; 5=excellent.

While the quality and effectiveness of online education was the worst, together with the digital preparedness of the instructors, they all received a rating above 3.5. These lessons urged the university's leadership to take steps towards quality and efficiency through trainings and tutorials, looking ahead to the semesters of the next online education.

In a subsequent question, we asked our instructors to evaluate the criteria listed below (Figure 2) as factors causing difficulties that were challenging for them during the online semester.

The new administrative burdens clearly caused the greatest challenges and problems for all of them, besides the fact that there was no possibility of direct, personal contacts, and slipping together of the world of work and their family life was also a big problem because of working from home. The least difficulties were to maintain contact with the study office or to ensure information security.

Figure 2
Difficulties in online education based on the opinions of teachers



Viewing satisfaction from a different perspective, from the students' point of view, we also focused on which areas caused them difficulties (Table 3). Thus, the lack of personal contact with educators was the most difficult since keeping contact was not easy, as well as the use of various educational platforms or the harmonisation of their work (learning) and private life, which is a problem for many, even educators. Access to devices or internet were rated as least problematic.

Table 3
Difficulties in online education (students)

	N	F
Availability of study materials	39	4.7
Understanding of the learned items	73	8.8
Contact with the teachers	96	11.6
Contact with fellow students of the same year	50	6
Contact with the institution	63	7.6
Assurance of appropriate time for studies	75	9.1
Assurance of appropriate space for studies	47	5.7
(More) independent preparation	60	7.2
Use of ICT tools (e.g., PC, laptop, mobile applications)	11	1.3
Availability of ICT tools (e.g., PC, laptop, mobile applications)	18	2.2
Access to the internet or limited connection	36	4.3
Finding the way on the different platforms use by the teachers	91	10.9
Harmonisation of studying at home and private life	91	10.9
Online education did not cause any difficulty	57	6.8
Other:	24	2.9

We also wanted to know what the students need in terms of online learning materials, and how we could make their training more effective during the semester in digital-only form (Table 4). It can be concluded that the teacher's explanation is clearly the primary and necessary factor, followed by a series of practice tasks for the application of the study material. The existence of written course material only was seen to be the least help in terms of efficient learning. In other words, we have reached a point towards blended learning.

Table 4
The easiest way for me to learn online/digital study material is if...

the written study material is sufficiently detailed to understand without explanation	130
the teacher explains what is written (I can hear)	152
the teacher can be seen and explains the study material (video, podcast)	142
video helps you understand what you've learned (film, animation)	137
I have to apply the study material during the tasks I receive (I will try it)	146
Others:	10

We asked our teachers whether in the majority of their online (live) classes they sought to involve students in some form, as they would in classroom education. The answers of our teachers showed that they primarily gave the students an independent task, opportunities

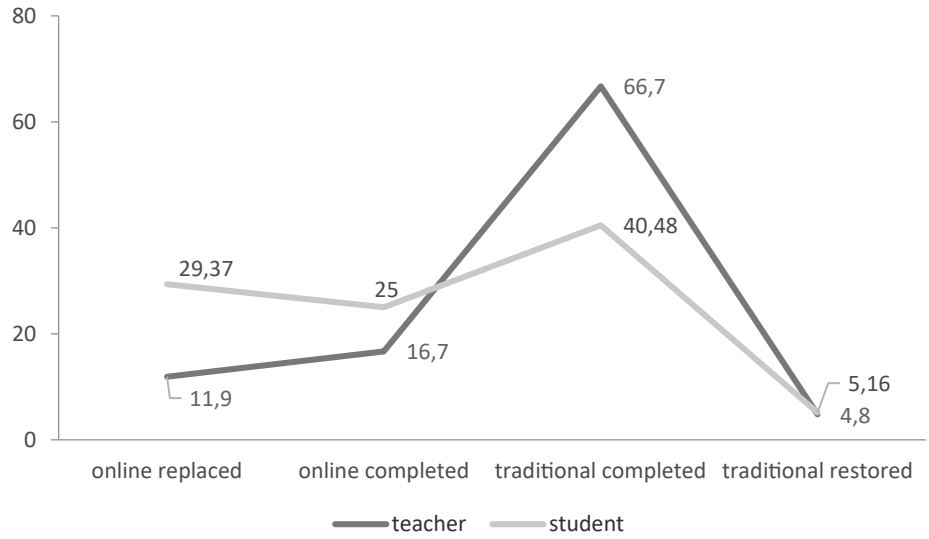
to ask questions, discuss topics or use cooperative learning techniques to process the given topic.

The future of online education

We considered it important to ask how they see online education as part of higher education (Figure 3). Although students still see traditional education as their priority, more and more people feel that this trend is about to reverse: either online training will take over the leading role in higher education, or this will be done by supplementing it with traditional classroom education. Obviously, the students also felt the importance of the latter, e.g., in the context of exercises or lab lessons.

In the case of teachers, too, the rise of online education from their responses was clearly visible. However, it is noticeable that they still expect the supremacy of traditional education. While students have responded to this question by suggesting that we are moving towards replacing traditional (classroom) education, educators think the role of traditional education is much stronger.

Figure 3
Future impact of the pandemic on higher education according to educators and students (%)



DISCUSSION

In traditional higher education, the primary source of learning is frontal classroom education, where the teacher is active, the transmitter of information, and the students learn the study material as passive recipients. This is complemented by working independently, individually, in pairs or in groups. In contrast, today's university students are characterised

by an intensive use of the internet, both as a source of communication and entertainment (Bessenyei, 2010). In Anglo-Saxon countries, it is believed that the thinking, perception and with it the learning perception of today's net generation of digital natives differ significantly from those of previous generations (Hargitai et al., 2020; Prensky, 2001). Meanwhile, Schulmeister (2009) refers to the same generation as the media generation in Germany because the internet only gives them the opportunity to stay connected with others and be entertained; they do not use it at all for their learning activities. That is, they do not have different ways of thinking or different learning habits but use the internet only as a medium (Hargitai et al., 2020; Schulmeister, 2009). In our study, too, it was considered as a point of view whether the students and teachers at our university belong to the next generation or the media generation, and whether this can determine their relationship to online education, i.e., whether online education has appeared as a defeasible difficulty or opportunity for them.

Over the past two decades, the number of online courses and programmes has increased significantly in higher education practice, which has been a natural part of the globalisation of education due to the gaining ground of the online world. Due to the increased demand for online education and the interest of higher education institutions in creating diversified educational opportunities, this growth is expected to continue in the future (Allen & Seaman, 2008). The question of the future of online education is a legitimate question for all higher education educators/researchers or students. This aspect was also one of the focuses of our questionnaire survey, assuming and experiencing a difference in the opinions of teachers and students.

Online education as a form of education includes computer-based educational platforms and methods of sharing educational material, as well as a wide range of forms of educational material, such as multimedia educational materials, simulations, games, and their application even on mobile platforms. Using all this, the emphasis in online higher education is on collaborative learning (Hargitai et al., 2020). Therefore, these issues, both in terms of platforms and educational material, have been included in the empirical study. Heuer and King (2004) have already found that ICT is transforming students' expectations; the emphasis was placed on the fact that although online education resembles traditional education in many of its characteristics, it also has its own characteristics: flexibility (available anywhere, anytime); reflexibility (i.e., the possibility of feedback on the study material) and the possibility of anonymity; the latter is mostly not possible in the traditional educational process. This was complemented by further findings by Dabbagh and Bannan-Ritland (2005), who listed the following as the top four characteristics of traditional education: restriction to location and student presence, real-time quality, teacher-driven/controlled, and employment of exclusively linear educational solutions. And as Keengwe and Kidd (2010) indicate, in the online education and learning environment, asynchronous and real-time communication is possible, which can thus be the basis for informal, dynamic and diverse pedagogical practices, i.e., active learning, to help the pedagogical activities move from an educational paradigm to student-centred learning.

In accordance with the Hungarian higher education strategy document *Fokozatváltás a felsőoktatásban/Change of degree in higher education* (Hungarian government, 2016), according to the higher education vision, a unified online digital environment is emerging in Hungarian higher education, offering personalised learning opportunities tailored to age, interest, and individual life situation. An online learning space and learning community are created where members of the community receive support for their lifelong learning and development. In this online space, the higher education institutions display and further develop their training offers in a flexible response to training needs. Along with this, it has become a strategic goal that the digital preparedness of higher education graduates must be of an international standard, with breakthroughs in three main areas.

Firstly, a transformation of the current methodology and approach to education and learning, a paradigm shift in higher education is needed, encouraging institutions to implement student-centred learning and exploit the full potential of ICT in education and learning. In addition, it is essential to build a learning space, university life and, beyond it, to build a digital learning community that helps students and educators alike. Finally, the development, maintenance, and efficiency improvement of the infrastructure necessary for the paradigm shift is also essential (Perényi, 2020).

According to the results of a wide-ranging survey, most of the world's higher education institutions would like to keep the traditional forms and methods of education for convenience. But it is also clear to them that there may be new epidemics or other globally unpleasant events in the world at any time, for which education must be prepared and transit smoothly. Only universities and colleges that can adapt quickly to new circumstances and manage costs flexibly and efficiently can survive, also in the longer term (Gonda, 2020).

CONCLUSIONS

In our research we examined the problems and difficulties of the first semester of online education resulting from the epidemic, both on the teaching and student side. We tried to summarise which useful experiences can be transferred to further online semesters, what problems we need to solve in terms of online education, both in terms of the need for technology tools and their training, development, methodological requirements and impacts for all actors in education.

Our findings to the research questions asked at the beginning of the study are as follows:

R1 How did and do the teachers and students of Dunaújváros University relate to online education? R2 How did our students and teachers experience digital education?

The students and teachers of the University of Dunaújváros already had a grasp of online teaching and learning, as our institution has a history of nearly a decade in these activities, thus the transition to full online education was handled relatively smoothly. But this period was not without the challenges and difficulties that were manifested in the learning-teaching process; in addition to the availability of learning materials and the

digital preparedness of students, the burden on teachers was significant, having to meet the demands of the education methodology and specially digital education, as well as facing issues in the supply of equipment.

R3 What difficulties and problems did they face?

Although their relationship with digital/online education was positive, the most significant problem they perceived was the lack of personal contact and excessive administrative burdens (instructors), while the students also mentioned the lack of personal relationships in the first place. Both groups had a significant problem with the overlapping of work and private life, the two areas resulted in significant additional burdens not only in terms of space but time as well, and in the activity of both our students and instructors surveyed at the same time.

R4 How do they see the future of online education?

Regarding the future of online education, the conception of students points towards replacing traditional education with online education; while the teachers also see this expansion as real for online education, but, assuming this as a slower process, they feel that the preponderance of traditional education remains a characteristic of higher education as a whole in the longer term. The experience gained through the study confirmed the need for both, and this, as we have experienced since then, can be best embodied in hybrid solutions, in so-called blended learning. Teaching in a non-traditional form facilitates adaptation to different life situations, the student learns the study material at a time that meets his or her own needs, using methods other than traditional ones, which promotes the success of participation in the training.

Of course, the information revealed during our study confirms the limited nature of the generalizability of the results due to the local nature of the sampling and without control measurements. However, to also assess the success of putting the findings of the study into practice, further research is planned among students and teachers.

During the questionnaire survey and based on our own experience in higher education and other similar institutional studies (Grajczjár et al., 2021; Serfőző et al., 2020; Sipos et al., 2020), we can say that the hybrid approach will be the dominant aspect of the uncertainty caused by the pandemic worldwide in the future. The essence of the solution is that although many students and higher education institutions strongly prefer personal/attendance education and learning, health and safety concerns force higher education institutions to use personal and online teaching methods together. Previous studies have already shown good results in terms of its effectiveness (Forgó, 2013; Hargitai et al., 2020; Sipos et al., 2020). We found that support for hybrid systems, a similar way of teaching to blended learning to be organised in the future, is significant.

For nearly two years, the pandemic has shown that online education (whatever you call it: digital, absence, distance learning) is the basis of future higher education and is also justified in the higher education of the present. At the same time, it is expected that there

will be a methodological transformation, which means rethinking methods, techniques, teaching materials, accountability, etc., and its planned placement in a new system (Deés, 2020; Rajcsányi-Molnár & Bacsa-Bán, 2021; Serfőző et al., 2020). We consider our presented teacher-student examination in our higher education institution as an addition to this transformation.

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