AKADÉMIAI KIADÓ

Online only: Future outlooks of post-pandemic education based on student experiences of the virtual university

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ABSTRACT

The COVID-19 pandemic has resulted in a widespread shift to online education around the world and in Hungary, too. Educational institutions from kindergartens to universities were forced to adapt rapidly to this new situation, when the space of education moved from classrooms to online video meetings; the regular methods and tools needed to be changed or modified. Nonetheless, we should keep in mind that online education itself was an already existing concept before the pandemic as part of digitalization as a current societal megatrend, however it was not widely used in educational institutions across different programs. By 2021, there are university students who have mostly or exclusively participated in higher education online. Online classes could be a new normal situation to these students instead of the pre-pandemic personal activities in physical classrooms, leading to altering the norms of participation. In our research, we collected answers to open-ended sentences from such students. As we wish to understand how students perceive the differences between online and offline education, we investigated the perceived advantages and disadvantages of online-only education, how this influenced their social networks, study efficiency and their whole experience in university education.

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1. INTRODUCTION

Modern achievements in the development of information and communication technologies have led to the formation of a global digital economy that, in turn, opened new opportunities for organizational and institutional design in business and other spheres of social and economic activities. The digital economy is functioning on electronic goods and services, including electronic business and electronic commerce, and using electronic payments. However, this definition can be expanded with such directions of e-economy as e-government, e-media, and, in the scope of the present study, e-learning (Berdykulova et al. 2014). "E-learning is defined as learning by using electronic equipment, especially using a digital computer" (Lipovszki – Molnár 2006: 83).

While digitalization has already been an ongoing megatrend, the COVID-19 pandemic has still caused major changes in the economic and social structures and practices since the Spring of 2020. Our paper examines education as a fundamental asset of society. Lockdowns and other restrictions forced a rapid need for digitalization in education practices, as, more or less from one day to another, all participants were driven to adapt to an *online-only environment*.

Indeed, online classes became a new normal (Hrubos 2021) to many students instead of the pre-pandemic personal activities in physical classrooms, altering the norms of participation. In our research, we used open-ended sentences to collect answers from 185 university students on their views and attitudes about their current university experiences. The answers of the participants reflect the changes and difficulties they had to face, but the answers also let us understand how they perceive the teachers in this online-only education environment. Altogether, we gained a better understanding about time, space, and human aspects of this new kind of education, and those insights could help us formulate some suggestions on how teaching and learning can be improved in digital education.

2. LITERATURE REVIEW

2.1. E-learning in the context of COVID-19

As education, interpreted as formal learning, belongs to the services industry, we should note that digital transformation has gained global attention and prominence in services, due to the pervasive nature and proliferation of recent digital advances. If IT-enabled transformation was referred to as evolution, digital transformation, then, is the so-called Fourth Industrial Revolution. Digital service transformation is tough, as there is a fundamental difference between the scope and complexity of the transformation at hand. The combination of today's digital technologies and environments such as social media, mobile devices, a focus on big data analytics, cloud storage, and the Internet of Things (IoT) has the potential to deliver much more far-reaching change (Zaki 2019). Digital technologies are becoming increasingly embedded into products and services. However, success in digital transformation is not about introducing new technologies. It is about enabling a digital team that can support and demand change. Successful organizations will be the ones that are continuously learning about, aware of, and experimenting with these emerging digital technologies (Guinan et al. 2019). Education and skill systems can help facilitate lifelong learning and adapting skill sets as local economies and industries evolve (OECD 2019). More specifically, the ways how teachers design new teaching materials

(Horváth 2002), how the organization (teachers and students) adopts new technologies and adapts to the whole digital transformation are key factors in contemporary education services, so educational informatics training should be a strong priority in higher education (M. Pintér et al. 2021).

Teaching and learning can benefit enormously from the use of Web 2.0 applications and services. The diversity of tools that make up a Personal Learning Environment (PLE) allows for flexibility across a broad range of contexts and learners. Motivation may also be increased as the student is actively involved in the learning process. Instead of being a receiver of information, the student becomes the protagonist of the learning experience (Kompen et al. 2019). It has been acknowledged that schools and education of children should undergo an extensive digital transformation to be able to meet the needs of the young generation and their digitalized future. Before the coronavirus pandemic, the global education technology sector, which includes online learning, was growing by about 15.4% a year worldwide (Toth-Stub 2020). The pressure exerted by the pandemic has radically accelerated this process as it suddenly and abruptly forced schools and education as a whole to engage in such a transformation. A great burden was also placed on children and their families who suddenly had to acquire a variety of skills, competencies, and resources (Iivari 2020).

The definition of e-learning has evolved with the evolution of the Web (Choudhury – Pattnaik 2020), while the importance, role, and clarification thereof has become more and more the focus of related academic research. E-learning can be conceptualized as an alternative to traditional education (Kumar et al. 2018). It "is a combination of methods, structures and networked electronic tools orchestrated into systems that bring about, or are intended to bring about, learning" (Dron – Anderson 2016). The concept of e-learning can be recorded as the use of various web-based educational tools suitable for education (Muhammad et al. 2016). From another viewpoint, "e-learning is defined as the transfer of knowledge and skills, in a well-designed course content that has established accreditations, through an electronic media like the internet, Web 4.0, intranets and extranets" (Choudhury – Pattnaik 2020: 2). The advantages of e-learning can be stated that its flexibility, accessibility and cost-effectiveness can play a big role in exploiting the opportunities of lifelong learning (Alqahtani – Rajkhan 2020).

2.2. The impact of COVID-19 on higher education

The impact of the pandemic on students has been addressed in several studies over the past year and a half, but those are more mosaic-like empirical studies (Hrubos 2021). Most research has typically been limited to one country (Singh et al. 2020), often to one university (e.g. Hattar et al. 2021; Bogdandy et al. 2020; Deés 2020), while, so far, little attention has been paid to the complex, international context (see e.g. Aristovnik et al. 2020; Molnár et al. 2020). Among the applied research methodologies, questionnaires appeared the most often, but we can also see examples of interviews (Piyatamrong et al. 2021; Kálmán et al. 2021), case studies (Molnár et al. 2020), and interpretative phenomenological analysis (Kee 2021). Regarding educational levels, students' attitudes and experiences about online education were most measured in BA and postgraduate courses, and postgraduate students were found to be more prepared and successful in online education (Tang et al. 2021). Programs are also an important factor in terms of online education experience, as the replacement of traditional education with practical courses in engineering (Piyatamrong et al. 2021) or medical programs (Amir et al. 2020) requires a

different approach. There are different results by gender in adoption of online education. Tang et al. (2021) found no significant difference between female and male students. However, Bisht et al. (2020) claimed women were better adapted to online education. But Hargitai et al. (2020) showed that men applied online learning facilitator materials more often than women.

2.2.1. Online teacher and student encounters. Based on a survey by the European Students Union, Aristovnik et al. (2020) summarized the students' experiences of the pandemic period. In the transition from the classroom to online education, the majority of students preferred education via live video connection (Aristovnik et al. 2020). Chick et al. (2020) showed in the context of surgical students that practical lessons can indeed be replaced, to some extent, by high-quality surgical videos, but in no way entirely. Piyatamrong et al. (2021) also found similar results in the case of engineering students, and Sehgal et al. (2021) in the case of optometrists. In addition to courses, students are also interested in webinars, online quizzes, and other programs (Chowdhury – Mahapatra 2021). Hattar et al. (2021) also confirmed this, as more than half of the students in their sample rated both online group discussions and online lectures explicitly positively. However, group discussions are considered better in offline mode (Amir et al. 2020).

2.2.2. Online teaching methods. In their assessment of the academic side (i.e. the work of instructors), students were typically satisfied with the availability of instructors, the quick and varied response provided online, and the sharing of information related to preparation (Aristovnik et al. 2020). Research by Chowdhury and Mahapatra (2021) also showed that students were generally satisfied with virtual teaching methodologies and techniques, however, only 10% of them considered the quality of online education to be better compared to traditional offline education and half of the respondents considered the quality of offline education to be better. However, Piyatamrong et al. (2021) identified educators wanting to transfer their traditional ways of teaching to the online platforms unchanged as an issue. The same phenomenon was also described by Pazos et al. (2020), however, the authors here highlighted that students were not sufficiently prepared for the online form either. Rahman (2021) also named such limitations as lack of technical and pedagogical skills of teachers and insufficient student engagement, which is due to the lack of knowledge about the specific features of e-learning (Octaberlina – Muslimim 2020). These results also underlined the importance of improving digital competences (Czirfusz et al. 2020).

2.2.3. Online assignments. The number of tasks to be performed seems to have (significantly) increased for students and lecturers alike (Aristovnik et al. 2020; Deés 2020), they have become overwhelmed (Kálmán et al. 2021). However, their attitudes towards assessments are not uniform, with some who would abolish exams altogether and replace them with continuous mid-year assessments, while others see a combination of these as a better solution (Chowdhury – Mahapatra 2021). However, the online exam turned out to be also less stressful for students (Bisht et al. 2020). Several sources also identified paying attention to lessons in online education as a problem (Amir et al. 2020), which resulted in the majority of students feeling less motivated (Hattar et al. 2021; Kálmán et al. 2021) and their performance deteriorating (Aristovnik et al. 2020). Amir et al. (2020), however, highlighted that the online platform provides a more efficient method of learning because there is more time to learn and review materials.

2.2.4. Availability of online education. In terms of access, the majority of respondents identified their computer as their primary work tool (Aristovnik et al. 2020). However, the problem

of technical access has been identified by several researchers as a key issue (Amir et al. 2020; Octaberlina – Muslimin 2020; Chowdhury – Mahapatra 2021; Deés 2020), followed by the instability of the internet and electricity (Bisht et al. 2020; Al-Amin et al. 2021), and by high costs of data plans, lack of compatible devices, lack of conducive equipment at home (Rahman 2021). In Handel et al.'s (2020) research, while students were very well equipped with the appropriate tools, typically working from a computer, there have been mixed results in terms of technical skills. They were the most confident in online communication, while managing individual software and online learning platforms received the lowest values.

2.2.5. *Social life.* In the field of social life, students most often spoke to close family members online, and least often to university administration staff (Aristovnik et al. 2020). Social relationships and students' relationships with their peers and faculty are of paramount importance in higher education as they provide a "sense of belonging to a meaningful learning community" thereby contributing to "students' learning experience in online learning" (Händel et al. 2020: 2). Moreover, collaboration with peers has been cited as a specific advantage of online education (Hattar et al. 2021). At the same time, the research by Piyatamrong et al. (2021) reveals the exact opposite, stating that students are disappointed with the effectiveness of online learning, which is attributed to the lack of informal encounters and interactions. Wilson et al. (2020) highlighted the difficulties in building social relationships online.

2.2.6. *Emotional life.* Regarding the emotional life during the pandemic, in the study by Aristovnik et al. (2020) participants highlighted the feelings of hope, joy, and pride among the positive emotions. Among the negatives, anxiety, frustration, anger, hopelessness, shame came in the first place. Overall, students provided feedback on a relatively low number of positive emotions and a relatively high number of negative ones. In Händel et al.'s (2020) study, students reported average values (pressure, overload, anxiety) in terms of social and emotional loneliness, while "pleasure" received a higher rating than "evil". Examined in its context, students who had the right tools reported higher digital ability and had more experience, less negative emotion, and more joy. Kee's (2021) research identifies the effects on emotional life along five themes: accepting virtual learning and dealing with frustration, feeling anxiety and fear of losing power and control, incorporating coping strategies, and finding relief. They questioned the effectiveness of the learning environment, found it difficult to manage not seeing each other and could not control all their activities. Biavardi (2020) also highlighted the negative psychological effects of online learning, such as post-traumatic stress, confusion, and anger. Bisht et al. (2020) also drew attention to the confrontation with mental pressure in students. In addition to emotional and mental difficulties, Octaberlina and Muslimin (2020) also drew attention to the deterioration of the physical condition, such as straining the eye. According to Kálmán and Tóth (2020), to compensate these negative mental effects, universities should have grounded modern supportive systems for students.

2.2.7. *Future solutions for the improvement of online education.* Overall, we can see that students were typically satisfied with online education (Sun et al. 2020; Aristovnik et al. 2020; Bogdandy et al. 2020), yet they do not consider online education to be a perfect substitute for offline education (Hattar et al. 2021). Burns et al. (2020) point out that online education was confusing because it had to be abruptly switched to and education did not go as planned. However, in addition to identifying some problems, the exploration of possible solutions is also

an important result of previous research. Rahman (2021) suggests the use of innovative tools, teacher training, student-friendly content development, and a fundamentally positive attitude to solve these problems. According to Octaberlina and Muslimin (2020), to make the curriculum more accessible, it would be worthwhile to use compressed files, introduce breaks, strengthen communication with educators, and develop a new learning style that works more effectively in the online space. According to Kee (2021), students need emotional support the most. Tang et al. (2021) make the following suggestions for educators and higher educational institutions about the future: supporting students in active peer-to-peer learning, supporting group work, creating communities, using the tools of existing social networks, integrating virtual games into education (especially with a degree) for students who do not yet have it, and general preparation for live online education.

However, according to lecturers, from an educational viewpoint, there are more negative sides while from a research perspective, there are positive effects (e.g. the possibility of increasing source concentration and information sharing) (Kálmán – Tóth 2020).

3. RESEARCH METHOD

Due to the second wave of lockdown in Hungary, the Spring 2021 semester saw a full online education setup. The previous two semesters affected by the COVID-19 pandemic were a combination of an offline start of semester and a move to online arrangements in the second half. Based on the experiences of the first shifts to online platforms, such as the practices of organizing online exams, meetings, and course arrangements were helping both educators and students to build upon, and to create better interaction, knowledge-transmission and evaluation methods online. Therefore, the aim of this study was to shed light on the experiences of a fully online semester, with some previous experiences of a lockdown, yet without the stress of the abrupt switch of education form as pointed out by earlier studies (Burns et al. 2020). For this end, the transformation of the perception of roles of the Educators and Students (jointly referred to as Human), physical and online Space of the built and digital infrastructure of the University (the institution) were examined, implicitly introducing the dimension of Time as a reference point to the experience (present experience defined with a projection to the Past or Future).

3.1. Data collection and sample

Data were collected from university students using an online survey. The survey question items were elaborated by our research team in online discussions based on the research scope. Participation was voluntary and anonymous, students were offered a few extra points in return in marketing related courses. The survey was conducted between the 1st and 14th of May 2021, which corresponded to the last two weeks of the term time of students' first online-only semester. As such, the participants could provide their views based on a more or less complete semester. The students were invited to participate by the educators in their respective courses, therefore the research is based on arbitrary sampling.

The final sample includes 185 responses, all from students in Business Studies. 166 from Corvinus University of Budapest, and 19 from Károli Gáspár University, both universities in Hungary. However, the sample can be considered homogeneous in the relevant aspects, because students were selected from business studies, partly taught by the same educator, and most

importantly the e-learning tools and environment were the same, as they should have used Microsoft Teams for online participation in the lessons, and Moodle and Neptun were used in course administration.

The majority of our sample was composed of women: 143 respondents (77.3%), and 42 respondents (22.7%) were male. The average age was 24 years, the mode was 21 (63 respondents). The majority consider themselves a full-time student (117 respondents, 63.2%), but it is to be noted that the survey was also made available to students in correspondence courses (part-time education programs), which may explain why others consider themselves rather employees than students. The perceived living standard of the respondents can be considered good, and the majority stated they do not face financial challenges. 127 respondents (68.6%) did not report any challenges, and only 2 respondents reported significant financial restrictions in their life.

Three online platforms were generally used during the semester at the examined institutions. MS Teams was the most important platform for organizing courses, examinations, meetings, conferences, etc. Moodle is an online learning management platform that was already used before the pandemic for organizing course materials, thesis submissions, and evaluation. It also offers extended tools and features (online surveys, tests, videos, etc.) newly explored and adopted by a number of educators during the online semesters. Finally, Neptun is a nation-wide platform for registering grades and administering studies.

3.2. Projective research technique – sentence completion and grounded theory

This research is based on a projective research technique, namely sentence completion. It is a semi-structured indirect inquiry method designed for understanding an undiscovered situation, in our case students' experiential and emotional reflections on distance education. Sentence completion is a combination of a projective technique and a questionnaire, whereby respondents are provided with beginnings of sentences (called sentence stems) that they then complete in ways that are meaningful to them (Soley – Smith 2008: 132). By providing only the beginning of the sentence, the researcher introduces the context, but it is the respondents' freedom to complete it as they like (Kujala et al. 2014). Its objective is not measurement (as in the case of traditional survey methods), but the exploration of emotions, beliefs, attitudes, motivations. Projective techniques help the researcher to get closer to the inner world of the research subjects in a way that they remain in their comfort zone. Projective techniques help to overcome communication barriers, uncovering aspects of human behaviour that are otherwise difficult to study. Unlike direct interview techniques, where respondents may provide socially expected answers, in this case, social expectations are not available for respondents (Steiman 2009).

Therefore, the survey was designed to elicit present-time perceptions, but it gave room for references to the past-time experience of pre-online schooling as well as for projections to the future. As mentioned above, data collection, sampling, and the formulation of the survey's questions derived from previous research and theory. Projective techniques, such as open-ended questions result in open, less structured responses, therefore a grounded theory approach is the most suitable for interpretation of the data. Based on a grounded theory coding approach (Charmaz 2006) the codes were formulated close to the text, then abstracted and interpreted in the context of other empirical findings presented in the theoretical overview. A two-phase coding technique was applied, and all codes were validated by three different authors of this

paper. The first phase of open coding served the deeper understanding of the text, allowing for discovering new phenomena discovered in the data. Sometimes dozens of codes result from open coding (Strauss – Corbin 1999). The text was coded sentence by sentence, each sentence belonging to a respondent. The results of the first coding were discussed among the three different coders, making comparisons for similarities and differences between each data with respect to the concepts identified in the literature review. The identified properties were labeled, and the results were developed into categories. The second phase focused on the narrow-interpretation and cross-checking of these categories with the goal of arranging the data around the phenomena identified in the literature review. The open coding technique thus was brought into line with the literature review, thus connecting the human and space component to the time dimension, while allowing for emergent categories (Table 1). Finally, based on a consolidated coding structure, a blind-validation was applied.

The examined sentences embedded the main dimensions in the reflected categories, along the main axis of Space and Human, where reference to Time in the intersection of the two. The Human dimension was covered by the two roles of educator and student. The open-ended sentences in these latter two provided space for self-definition of students in their roles with a reflection on their interaction with their peers. Although all the questions were addressed to the recent experiences the students were going through, with comparison to other points in time, respondents were reflecting on their past and some were also envisioning future scenarios (mostly referenced as utopia). We also have to mention the limitation of the methodology as the order of the sentences could influence the students and we also have to count with the subjectivity.

4. FINDINGS

4.1. Space dimensions

Surprisingly, students in the sample were able to imagine education without the physical walls of the university (sentence 1: S1), yet only as a completely separate entity and a need to defining it with a new label. It is recorded as an intangible online space [$n = 97$] that "*simultaneously opens boundaries and narrows the context into a shining rectangle*". The "*long-term online course*" expands the boundaries by widening the freedom/space, creating opportunities for parallel activity and "*forcing creativity*". They do not accept its existence as a university, *per se* [$n = 64$], "*foreign to them, in which they themselves exist only as strangers,*" far from each other, devoid of social interactions [$n = 36$] as half-men like the "bride without a groom". Related to this, they highlight the lack of security ("*there will be no alma mater, no origin, no sure point and basis in the later mazes of practicing the profession*"), which also disappears along the walls and creates "*soulless soldiers*" from the crowd of students buzzing inside.

With regards to the online space itself (S2) for organizing studies, respondents were less nostalgic about the past time arrangements of education. Education on online platforms (Teams, Moodle and Neptun) were found to be an unavoidable necessity and present reality [$n = 75$], where respondents stressed its functionality [$n = 48$], without which organizing studies would be "*chaotic*", "*difficult*", "*unorganized*", or even "*terrible*" and a "*nightmare*", as platforms are efficient [$n = 4$], and simply outdated and boring [$n = 8$]. Only a small fraction of respondents found that without online platforms education was/would be better [$n = 26$], such as "*more*

Table 1. Open-ended sentences of the survey: designed (Space, Human) and elicited categories

Open-ended sentence for completion	Category	Relation to...	AXIS TIME	Elicited categories		
				Elicited categories	N	Illustrative answers
S1 A university without walls, buildings and rooms is. . .	SPACE	Scenes of education/Physical place	Present/ Future	Intangible space	97	*"not even a university, just an online platform"*
						"not even a university, but a virtual space where there are no basic human relationships"
				Non-existent	20	*"as if it doesn't even exist . . . it wouldn't be real and tangible"*
						"like a car without parts"
						"like a soul without a body"
						"like a bride without a groom"
				Void	36	*"do not provide the experience that comes with the term "college years""*
						"soulless soldier"
S2 University studies without digital platforms (Teams, Moodle and Neptun)		Scenes of education/Online platforms	Present/ Past	Necessity	75	*"would be impossible to manage the current situation otherwise"*
						"unimaginable, I don't even remember when I wrote on paper last time"
				Functional	48	*"are unimaginable and not functioning"*

(continued)

Table 1. Continued

Open-ended sentence for completion	Category	Relation to...	AXIS TIME	Elicited categories		
				Elicited categories	N	Illustrative answers
						"[are where] the upload of documents, and the process of submitting would be much more complicated"
						"would be more difficult for administration, though the Teams platform is often out of sync"
				Efficient	4	*"would be inefficient"*
						"would mean too many things to remember"
						"would be much messier"
				Offline/outdated	8	*"are not an education"*
						"evoke the past century; sounds like a utopia"
						"would cause the death of much more unfortunate trees"
				Less stressful	12	*"would be less stressful, but would not be easier"*
						"sound like freedom"
						"would cause less swearing"

(continued)

Table 1. Continued

Open-ended sentence for completion	Category	Relation to…	AXIS TIME	Elicited categories		
				Elicited categories	N	Illustrative answers
S3 University teaching without educators is just like…	HUMAN	Educators	Present/ Future	Deficiency	97	*"theatre without actors"*
						"the library without books, useless"
						"like pizza without ketchup. You can eat it without ketchup, but it would be the most delicious with ketchup"
				Guidance	40	*"a team without a coach is fun for a few days but then leads to chaos"*
						"cooking a new dish without a recipe"
						"playing sports without a coach: you'll be fine, but you'll never get to the Olympics"
				Security	19	*"a child without parents"*
						"learn to drive without an instructor"
						"hospitals without doctors and nurses"
S4 The student who never met their peers in person…		(Students) To peers	Present	Isolation	64	*"is lonely and isolated"*
						"might feel lonely at the University"
						"is just like an internet buddy"

(continued)

Table 1. Continued

Open-ended sentence for completion	Category	Relation to…	AXIS TIME	Elicited categories		
				Elicited categories	N	Illustrative answers
				FOMO	40	*"misses a huge, new experience*
						"misses everything it is worth attending a University for"
						"missed an important part of their lives"
				Social capital	22	*"is being robbed of social capital"*
						"cannot establish new relationships, though that is an important part of years at University"
						"will be able to establish fewer valuable connections, and loses the ability to socialize"
				Disoriented	6	*"like Schrödinger's cat. Not for not knowing their peers, but for not knowing if it is better or worse than way"*
						"doesn't know where he/she belongs to, cannot find their place"

Source: authors.

enjoyable", "*the real experience*" or even "*perfection*", "*my dream*", and "*hope*" with a clear boundary: "*[the university] would stay within the building*" with "*less bureaucracy*", adding to less stress without platforms [$n = 12$], and being more personal [$n = 4$]. The offline organization of studies without these platforms now also seems like a "*utopia*" to some respondents, or a "*remembrance of the good old times*" located in the past, that cannot be restored to the way it used to be before. "*University studies without digital platforms. . .*" was found to be efficient only by 4 respondents.

4.2. Reflections on educator and student roles

Just like they cannot fathom the disappearance of physical walls, the lack of teachers in higher education (S3) is similarly unthinkable for responding students, which they expressed in strong parables: "*pizza without ketchup*", "*car without wheels, no point in it*", "*the book without words*". This seeming deficiency is countered by the latent aspects of guidance [$n = 41$] and stability/ security ("*an endless maze in which we just wander back and forth*") that simultaneously capture their perceptions of the role of the educator. The teacher thus emerges as a "*coach*" without whom the team can succeed, but in the absence of a strategy, knowledge is not converted into success.

The completion of the sentence with regards to the student who never met their peers in person (S4) revealed the experience of isolation [$n = 64$] and loneliness, that was reflected as the identity of a "lonely onlineist", "avatar" or often described with metaphors as "*a child separated from their siblings*" a "*lonely surfer in the waves*" conveying feelings of being disconnected, disembodiment, such as "*the person who never looked into the mirror*" or feeling "*unhappy*" and "*sad*" even "*pathetic*" and the experience of being disoriented [$n = 6$] full of "*doubts*", or not finding their place, and loss of capability in asking for help [$n = 3$]. This had its impact on the required group-formation during the courses, and the team spirit, where respondents referred to disrupted connection, loss of efficiency and problems with finding peers, however these responses were relatively lower in number. The defined identity of this online student was described mostly as "*not a real student*", but a "*person who studies*", a "*plant*" or a "*high school student*". The missed opportunity stemming from a fear of missing out (FOMO) [$n = 40$] of the "*university experience*" where the student sentenced to online-studies would miss the "*best years*" and "*experiences*" of their lives", and more precisely missing out on social capital [$n = 22$] was a recurrent concern of respondents. Others [$n = 14$] added the disrupted community-belonging and friendships [$n = 22$]. The framing of loss was contrasted only by a small fraction of respondents focusing on empowered solutions (with a slight sarcasm at times), like forming the new friendships on "Teams-nights", informal offline meetings, or taking a chance on other platforms like Facebook to get closer.

4.3. Intersection of space, human, and time: the brick and mortar versus the online

The completion of sentence S1, thus the call for describing the university without walls evoked present time experiences where the loss of the physical walls seemed to create the loss, in turn, of metaphoric walls. This experience of no clear boundaries as mentioned earlier suggests the vision of fluidity in time, where the new reality has no reference points in time, no end, and no beginning – "*endless courses*", and "*no origin*" to relate to. The fact of the shift itself marks a new era, where in the "*post-COVID*" world a virtual university becomes an everyday reality, while

before that "*it would have been a bad idea*". Interestingly, the responses mostly reflected the present time frustrations about imagining the loss of the symbolic meaning connected to the walls of the University as a building, and the frustrations connected to the new experiences of online education, which is a "*black box*", a "*screen*", or a "*website*", reflecting the abrupt and less expected shift of the materiality of the building toward the virtuality of the digital. This conversion of the meanings embodied in the materiality of a building toward the digital, created space for new meanings that were explored more extensively in S2. The futuristic view of the online university had been voiced out, as well as described as a "*progressive*" solution, which is "*modern*" compared to the "*traditional*" brick and mortar university, that was born in the year 2020, thus the beginning of a new era that swept away the previous structure. Interestingly, S2, asking the respondents to revert their realities back in time, thus imagining the brick and mortar university without the online platforms – serving for arranging and running their studies – as mentioned before did not elude a future scenario of "*getting back*" to the previous arrangements, only as a vision of "*utopia*" or a "*dream*", something that never shall happen again. The irreversibility of time created the irreversibility of meanings of what constitutes a "*university*" despite its materiality. These findings confirm what previous studies (e.g. Sun et al. 2020; Aristovnik et al. 2020) have suggested, namely that despite the overall satisfaction in terms of efficiency and functionality of online education, the abrupt switch has disrupted the vision of what constitutes a university. The dimension of the Past came to the fore especially with regards to the physical space of the university, and as a non-online platform education.

The brick and mortar University and the offline discussions and classes moderated by the Educators are important *sites* (Horváth et al. 2021) of building up social capital, one of the main *assets* gained in a University, apart from cultural capital (knowledge and diploma). Social capital is built through vivid interaction, where course activities play an important role. Through forming teams and friendships, students develop the sense of belonging to a community that is less likely to happen in online arrangements, confirming previous findings (Amir et al. 2020).

The effectiveness of the learning environment was confirmed by the respondents, finding online platforms a functional and efficient tool overall, that shall not be reverted, thus showing acceptance of virtual learning. However, the feeling of anxiety in dealing with frustration, and some loss of control over in-person activities, as reported by Kee (2021), has been also expressed in the second wave of lockdowns by the respondents. Isolation, disembodiment, disconnectedness, disempowerment, loss of social skills (see above) talk about the psychological effects of online learning as found in 2020 by others (Biavardi 2020; Bisht et al. 2020). However it should be mention that our survey had no intention of measuring the general anxiety about the epidemic.

To bring the results to a higher level of abstraction and to formulate the "story of the case" (Strauss – Corbin 1999), the central phenomena of the case were identified (Fig. 1). The structure is built on the two most important actors, Students and Educators as human factors. The educational environment can be broken down into a physical environment that can be linked to traditions and security and a digital environment that offers innovative, efficient methods, increasingly forming an inseparable unit in students' minds and anticipating the need to create a hybrid education system that can provide a long-term solution. The central phenomenon of the "story line" of the research was boiled down to social capital. Indeed, the gap between the material and immaterial dimensions is filled by social capital, which is partly a driving force in university education, partly a source of security and offers opportunities through social interactions, as discussed above. The isolation experienced in the digital space, the feeling
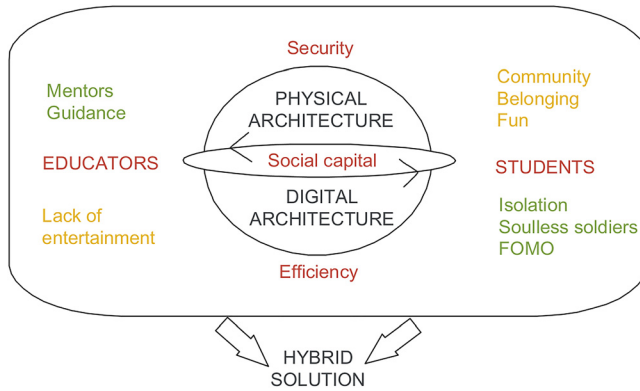
Fig. 1. Visual imprint and relationship system of the results
Source: authors.

of "fear of missing out," community, a sense of belonging, and fun are dissolved in the physical environment. The safety and guidance that is closely linked to this is expected and received by students from the educators. As part of the perception of the educator's role, the educator who educates and supports the unfolding of a real community experience, in addition to knowledge transfer and as an integral part of it, comes to the fore.

5. DISCUSSION AND CONCLUSIONS

The results reveal that participating students generally find online platforms functional and more efficient solutions for organizing their studies, scheduling, and to follow the courses, and see no way back to the previous state. Without online platform solutions, education does not seem imaginable anymore, which clearly suggests that these platforms shall be taken on and considered for further course design. Multiplying platforms, though, can bring in some confusion. Overall, our findings reveal that despite the preliminary experience with virtual learning, it still cannot be considered a substitute for offline education – which confirms previous studies (Hattar et al. 2021; Burns et al. 2020). The physical space of the university is seen as a *hub* for social interaction, community-building and developing social capital, thus investment into the future career. This role of the university as a hub for social networking shall be used in its materiality, therefore in hybrid arrangements live activities, team-building, and lively discussions need to be placed in the physical space, where professors can act as facilitators. Moreover, the reported mental distress caused by online education has to be addressed by offline community-building, bonding, and lively discussions. Based on the findings of the research and previous suggestions, Fig. 2 summarizes the suggested education tools.

In line with Rahman (2021), based on the current findings, it can be suggested that innovative tools in teacher training, and student-friendly content need to be adapted for shaping education. Moreover, the role of educators turned out to be a crucial one. Strengthening of student-educator communication is necessary (as suggested by Octaberlina and Muslimin 2020), to provide emotional support (Kee 2021). The findings of this study shed light on the loss of the
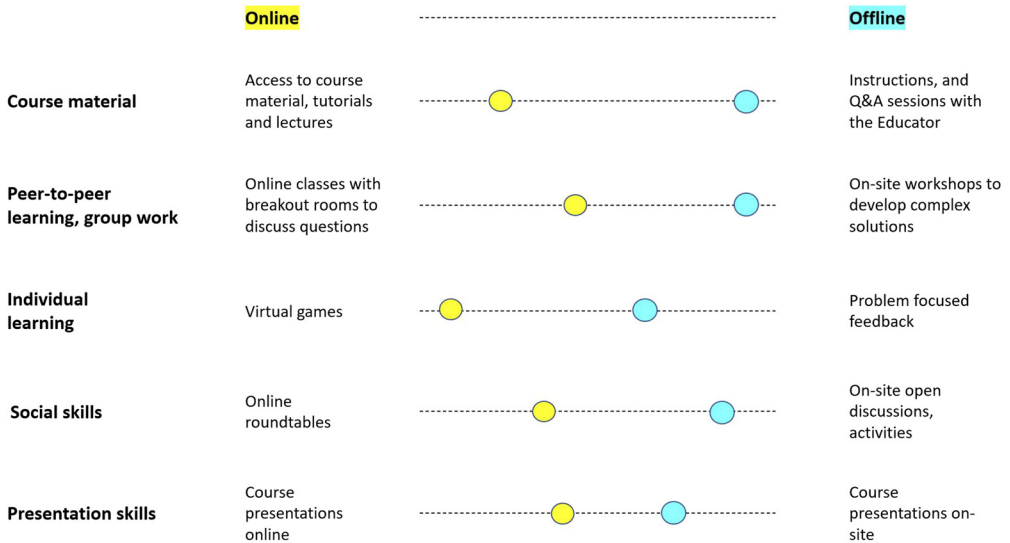
Fig. 2. Suggestions for hybrid education based on the findings
Source: authors.

role of the educator as a facilitator of social interactions, mentor in professional matters, support-provider in emotional matters and implicitly the fun element of the offline education experience. This switch from edutainment – thus the introduction of a variety of entertaining elements into the course to keep the attention of the student – to online education created a void. The figure of the professor standing in the spotlight of the audience, juggling with the variety of approaches was missed.

The findings suggest that some activities have less difference in perception and efficiency should they be performed online or offline, while others have a wider gap, bringing them closer toward one or the other arrangement. The combination of offline and online activities based on the mutual consent of the Educator and the Students is tending most toward an optimum. An example of the former –thus where there is less of a gap in preferences toward offline or online arrangements – is individual tutoring and consultation with the Educator, and focused Q&A sessions. Online, these may lack of the perceived spontaneity or moments of informality, while gaining on efficiency and focused approach to information exchange. A hybrid solution may involve occasional offline encounters, especially at the beginning, that might be shifted online at a later stage. Online tutoring and Q&A can efficiently complement offline lectures and seminars involving in person encounters during the course.

Virtual games can be also enjoyable offline in class, if played simultaneously and in the online space as well, complementing the course. Simultaneous presence defines the perception of peer-to-peer activities, should it be online in break-out rooms, or in class. Individual problem-solving tasks, although might be part of the methodological toolkit of a course, is least perceived as a positive experience, particularly in online arrangements. In this vein, roundtables can be invigorating and interactive online, yet onsite open discussions may allow for more possibilities in interaction and informality due to the physical arrangements in space. Workshops, activities

centred around developing complex solutions, particularly if involving a longer period of time are mostly better functioning offline. However, should a group working on a complex problem have met in person before, online work can be as efficient as offline.

Course presentations are efficient in timing and scheduling for all involved parties, while onsite presentations involve nonverbal communication to convey the message. Simultaneous group reactions, although manageable on online platforms with the raising hand function or voting and even some simultaneously managed group talk, are limited by the screen. Finally, onsite spontaneity and nonverbal communication enriches the one-way lectures.

Another interesting question can be later on how to strengthen the ability of teachers to cope with increased levels of stress and how can an institution provide them enough (emotional) support. Because it is clear that teachers can only fulfill those new social roles in education if they are able to cope with their own difficulties. As an emotional anchor of the class/course, the educators should be stable, whom the students can rely on when they encounter different professional and/or social challenges. The mental health of teachers will play a more important role, so institutions should adjust their human resource management to allocate resources in mental and professional training.

Therefore, post-pandemic higher education ought to clearly follow a hybrid education arrangement. The ideal curriculum of the new reality seems to be a mixture of online and offline activities supporting the study process. Online organizing of the courses rendered efficiency and transparency in following assignments, organizing course-work, and managing schedules. The biggest challenge of developing social networks is best met by offline activities. Social networks are fragile, they need to be maintained and facilitated. Therefore, a simultaneous set of offline classes and online classes need to be developed, where on-site activities mainly focus on group problem-solving and open-discussions. Presentation skills need to be developed for both online and offline situations, as business meetings, events and conferences have shifted to the offline domain, and due to its advantages of cost-efficiency and scheduling will remain mostly there. Meanwhile, offline networking events, and low-number participant events are coming up, therefore skills of public presence also need to be developed.

REFERENCES

Al-Amin, M. – Al Zubayer, A. – Deb, B. – Hasan, M. (2021): Status of Tertiary Level Online Class in Bangladesh: Students' Response on Preparedness, Participation and Classroom Activities. *Heliyon* 7(1): e05943.

Alqahtani, A. Y. – Rajkhan, A. A. (2020): E-learning Critical Success Factors During the COVID-19 Pandemic: A Comprehensive Analysis of E-learning Managerial Perspectives. *Education Sciences* 10(9): 216.

Amir, L. R. – Tanti, I. – Maharani, D. A. – Wimardhani, Y. S., Julia, V. – Sulijaya, B. – Puspitawati, R. (2020): Student Perspective of Classroom and Distance Learning During COVID-19 Pandemic in the Undergraduate Dental Study Program Universitas Indonesia. *BMC Medical Education* 20(1): 1–8.

Aristovnik, A. – Keržič, D. – Ravšelj, D. – Tomaževič, N. – Umek, L. (2020): Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective. *Sustainability* 12(20): 8438.

Berdykulova, G. M. K. – Sailov, A. I. U. – Kaliazhdarova, S. Y. K. – Berdykulov, E. B. U. (2014): The Emerging
    Digital Economy: Case of Kazakhstan. *Procedia – Social and Behavioral Sciences* 109: 1287–1291.

Biavardi, N. G. (2020): Being an Italian Medical Student During the COVID-19 Outbreak. *International
    Journal of Medical Students* 8(1): 49–50.

Bisht, R. K. – Jasola, S. – Bisht, I. P. (2020): Acceptability and Challenges of Online Higher Education in the
    Era of COVID-19: A study of Students' Perspective. *Asian Education and Development Studies*. https://
    doi.org/10.1108/AEDS-05-2020-0119. accessed 25/09/2021, ahead of print.

Bogdandy, B. – Tamas, J. – Toth, Z. (2020): Digital Transformation in Education During COVID-19: A
    Case Study. In *11th IEEE International Conference on Cognitive Infocommunications* 000173-000178.
    23–25 September 2020.

Burns, M. (2020): Online Education COVID-19's Struggle. *UKFIET – The Education and Development
    Forum*. https://www.ukfiet.org/2020/online-educations-covid-19-struggles/, accessed 01/09/2020.

Charmaz, K. (2006): *Constructing Grounded Theory. A Practical Guide through Qualitative Analysis*.
    London: Sage.

Chick, R. C. – Clifton, G. T. – Peace, K. M. – Propper, B. W. – Hale, D. F. – Alseidi, A. A. – Vreeland, T. J.
    (2020): Using Technology to Maintain the Education of Residents During the COVID-19 Pandemic.
    Journal of Surgical Education 77(4): 729–732.

Chowdhury, S. B. – Mahapatra, S. (2021): A Study on Students''responses on Digital Teaching Method-
    ology Under COVID-19 Perspectives. *Journal of Physics: Conference Series* 1797.

Choudhury, S. – Pattnaik, S. (2020): Emerging Themes in E-learning: A Review from the Stakeholders'
    Perspective. *Computers & Education* 144: 103657.

Czirfusz, D. – Misley, H. – Horváth, L. (2020): A digitális munkarend tapasztalatai a magyar közoktatásban
    [Experiences of the Digital Working Arrangements in Hungarian Public Education]. *Opus et Educatio*
    7(3): 220–229.

Deés, S. (2020): Hallgatói vélemények a COVID-19 világjárvány hatásaként bevezetett online oktatásról
    [Student Opinions About Online Education Introduced as a Result of the COVID-19 Pandemic]. *Acta
    Periodica (Edutus)* 20: 26–39.

Dron, J. – Anderson, T. (2016): The Future of E-learning. In: Haythornthwaite, C. – Andrews, R. –
    Fransman, J. – Meyers, E. M. (eds): *SAGE Handbook of E-Learning Research*. London: Sage.

Guinan, P. J. – Parise, S. – Langowitz, N. (2019): Creating an Innovative Digital Project Team: Levers to
    Enable Digital Transformation. *Business Horizons* 62(6): 717–727.

Händel, M. – Stephan, M. – Gläser-Zikuda, M. – Kopp, B. – Bedenlier, S. – Ziegler, A. (2020): Digital
    Readiness and Its Effects on Higher Education Students' Socio-Emotional Perceptions in the Context of
    the COVID-19 Pandemic. *Journal of Research on Technology in Education*. https://doi.org/10.31234/osf.
    io/b9pg7. accessed 25/09/2021, ahead of print.

Hargitai, D. M. – Sasné Grósz, A. – Veres, Z. (2020): Hagyományos és online tanulási preferenciák a
    felsőoktatásban–A COVID-járvány kihívásai [Traditional and Online Learning Preferences in Higher
    Education–The Challenges of the COVID Epidemic]. *Statisztikai Szemle* 98(7): 839–857.

Hattar, S. – AlHadidi, A. – Sawair, F.A. – Alraheam, I. A. – El-Ma'aita A – Wahab F. K. (2021): Impact of
    COVID-19 Pandemic on Dental Education: Online experience and Practice Expectations Among
    Dental Students at the University of Jordan. *BMC Medical Education* 21(151): 3261.

Horváth, K. (2002): Changing the Methodology of the Education of Informatics. *Society and Economy*
    24(3): 409–426.

Horváth, D. – Csordás, T. – Ásványi, K. – Faludi, J. – Cosovan, A. – Simay, A. E. – Komár, Z. (2021): Will
    Interfaces Take Over the Physical Workplace in Higher Education? A Pessimistic View of the Future.

Journal of Corporate Real Estate. https://doi.org/10.1108/JCRE-10-2020-0052. accessed 27/09/2021, ahead of print.

Hrubos, I. (2021): A koronavírus-válság hatása a felsőoktatásra. Európai és globális körkép [The Impacts of the Coronavirus Crisis on Higher Education. European and Global Perspectives]. *Educatio* 30(1): 50–62.

Iivari, N. – Sharma, S. – Ventä-Olkkonen, L. (2020): Digital Transformation of Everyday Life – How COVID-19 Pandemic Transformed the Basic Education of the Young Generation and Why Information Management Research Should Care? *International Journal of Information Management* 55: 102183.

Kálmán, O. – Eszes, F. – Kardos, D. – Lénárd, S. – Pélvölgyi, L. – Szivák, J. (2021): Arctalanság a távolléti felsőoktatásban – Oktatók és hallgatók dilemmái és kritikus eseményei a távolléti oktatás első időszakában. [Faceless in Distance Higher Education – Dilemmas and Critical Events of Educators and Students During the First Period of Distance Education] *Neveléstudomány: Oktatás Kutatás Innováció* 2063–9546(3): 23–42.

Kálmán, B. – Tóth, A. (2020): COVID-19 hatása a felsőoktatásra oktatói vélemények kérdőíves felmérése alapján [The Impact of COVID-19 on Higher Education Based on a Questionnaire Survey of Teachers' Opinions]. *12th International Conference of J. Selye University. Economics Section. Conference Proceedings.* Komarno: J. Selye University, pp. 209–225.

Kee, C. E. (2021): The Impact of COVID-19: Graduate Students' Emotional and Psychological Experiences. *Journal of Human Behavior in the Social Environment* 31(1–4): 476–488.

Kompen, R. T. – Edirisingha, P. – Canaleta, X. – Alsina, M. – Monguet, J. M. (2019): Personal Learning Environments Based on Web 2.0 Services in Higher Education. *Telematics and Informatics* 38: 194–206.

Kujala, S. – Walsh, T. – Nurkka, P. – Crisan, M. (2014): Sentence Completion for Understanding Users and Evaluating User Experience. *Interacting with Computers* 26: 238–255.

Kumar Basak, S. – Wotto, M., – Belanger, P. (2018): E-learning, M-learning and D-learning: Conceptual Definition and Comparative Analysis. *E-learning and Digital Media* 15(4): 191–216.

Lipovszki, G. – Molnár, I. (2006): Mobile Learning for Mechanical Engineers. *Society and Economy* 28(1): 81–94.

M. Pintér, T. – Bodnár, É. – Dósa, K. – Dorner, H. – Lénárt, K. – Lengyelné Dr. Molnár, T. – Gorana, M. – Ollé, J. – Margaryta, R. – Vörös, Z. – Dringó-Horváth, I. (2021): Oktatásinformatikai helyzetkép a magyarországi felsőoktatásban [Status Report on Education Informatics in Hungarian Higher Education]. *Új Pedagógiai Szemle* 71(3–4): 54–74.

Molnár, G. – Námesztovszki, Z. – Glušac, D. – Karuović, D. – Major, L. (2020): Solutions, Experiences in Online Education in Hungary and Serbia Related to the Situation Caused by COVID-19. *11th IEEE International Conference on Cognitive Infocommunications* 000601-000606. 23–25 September 2020.

Muhammad, A. – Ghalib, M.F.M.D. – Ahmad, F. – Naveed, Q.N. – Shah, A. (2016): A Study to Investigate State of Ethical Development in E-learning. *International Journal of Advanced Computer Science and Applications* 7(4): 284–290.

OECD (2019): *Trends Shaping Education 2019.* Paris: OECD Publishing.

Octaberlina, L. R. – Muslimin, A. I. (2020): EFL Students Perspective Towards Online Learning Barriers and Alternatives Using Moodle/Google Classroom During COVID-19 Pandemic. *International Journal of Higher Education* 9(6): 1–9.

Pazos, B. A. J. – Correyero, R. B. – Manchado, P. B. (2020): Digital Transformation of University Teaching in Communication During the COVID-19 Emergency in Spain: An Approach from Students' Perspective. *Revista Latina de Comunicación Social* 78: 265–287.

Piyatamrong, T. – Derrick, J. – Nyamapfene, A. (2021): Technology-Mediated Higher Education Provision During the COVID-19 Pandemic: A Qualitative Assessment of Engineering Student Experiences and Sentiments. *Journal of Engineering Education Transformations* 34: 290–297.

Rahman, A. (2021): Using Students' Experience to Derive Effectiveness of COVID-19-Lockdown-Induced Emergency Online Learning at Undergraduate Level: Evidence from Assam, India. *Higher Education for the Future* 8(1): 71–89.

Sehgal, S. – Shinde, L. – Madheswaran, G. – Mukherjee, P. – Verkicharla, P. – Easwaran, S. – Banamwar, K. (2021): Impact of COVID-19 on Indian Optometrists: A Student, Educator, and Practitioner's Perspective. *Indian Journal of Ophthalmol* 69(4): 958–963.

Singh, A. – Sharma, S. – Paliwal, M. (2020): Adoption Intention and Effectiveness of Digital Collaboration Platforms for Online Learning: The Indian Students' Perspective. *Interactive Technology and Smart Education*. ahead of print.

Soley L. C. – Smith A. L. (2008): *Projective Techniques for Social Science and Business Research*. Milwaukee, USA: The Southshore Press.

Steiman, R. B. (2009): Projective Techniques in Consumer Research. *International Bulletin of Business Administration* 5: 37–45.

Strauss, A. L. – Corbin, J. (1990): In: *Basics of Qualitative Research*. Sage, London.

Sun, L. – Tang, Y. – Zuo, W. (2020): Coronavirus Pushes Education Online. *Nature Materials* 19: 687.

Tang, Y. M. – Chen, P. C. – Law, K. M. – Wu, C. – Lau, Y. Y. – Guan, J. – He, D. – Ho, G. (2021): Comparative Analysis of Student's Live Online Learning Readiness During the Coronavirus (COVID-19) Pandemic in the Higher Education Sector. *Computers & Education* 168: 104211.

Toth-Stub, S. (2020): Countries Face an Online Education Learning Curve: The Coronavirus Pandemic has Pushed Education Systems Online, Testing Countries' Abilities to Provide Quality Learning for All. https://www.usnews.com/news/best-countries/articles/2020-04-02/coronavirus-pandemic-tests-countries-abilities-to-create-effective-online-education, accessed 07/09/2020.

Wilson, S. – Tan, S. – Knox, M. – Ong, A. – Crawford, J. – Rudolph, J. (2020): Enabling Cross-Cultural Student Voice During COVID-19: A Collective Autoethnography. *Journal of University Teaching & Learning Practice* 17(5).

Zaki, M. (2019): Digital Transformation: Harnessing Digital Technologies for the Next Generation of Services. *Journal of Services Marketing* 33(4): 429–435.