

Emergency forced pandemic e-learning - feedback from students for HEI management

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Abstract

The COVID-19 pandemic created many challenges for higher education institutions (HEI), one of the most important being forced e-learning – the involuntary need to move all educational activities to an online environment. In this exploratory study, we aim to learn from students' feedback on demands created by COVID-19 forced e-learning to provide HEI management with insights helpful in building educational policies that might promote students' positive perception of distance learning in turbulent times. Based on a convenience sample of more than 600 university students we implemented multiple regression analysis to explore the relationships between e-learning demands experienced by students and the three dimensions of e-learning perception: emotional experience with e-learning, cognitive evaluation of e-learning, and study engagement in e-learning. Our findings have shown that the e-learning demand most strongly related to a negative perception of e-learning was students' belief that during e-learning the university was plunged into chaos. This suggests that for students who participate in e-learning, the most important aspect of e-learning policy might be not, as we often intuitively think, the cutting edge e-learning platform & technology but rather effective reciprocal communication between HEI and students about the e-learning situation, allowing a perception of order to be created. The other insight from our results is the importance of the individual attributes of students in e-learning perceptions. Some proportion of the variability in students' perception of e-learning was not related to e-learning itself but to the students' individual attributes, such as their perception of e-learning feasibility, study-person fit and personal resources. Finally, our findings also contribute to the literature on e-learning satisfaction measurement, by supporting the validity of the multidimensional approach to student perception of e-learning.

Keywords: forced e-learning, blended-learning, COVID-19, emergency e-learning, HEI management

Introduction

There are different definitions of e-learning in the literature of the subject, but employing technology to provide online access to learning resources for the improvement of learning is its principal aspect (Holmes & Gardner, 2006; Sułkowski, 2020). Some authors have reported that the traditional style of teaching and learning is becoming outdated (Morton et al., 2016) and that e-learning may even replace traditional teaching methods (Górska, 2016). Despite the various benefits of e-learning programs run by the universities (Wong & Huang, 2015), it has been used to a very limited extent, and most universities have employed e-learning for add-on functions in their teaching processes (Guri-Rosenblit, 2005). However, recently COVID-19 enhanced significantly and on an unexpected scale the role and meaning of online education, which has appeared to be the only way of teaching since March 2020 in the majority of universities in the world. The coronavirus pandemic forced universities to switch their entire instructional apparatus to one of online delivery overnight (Liguori & Winkler, 2020). The primary objective in these circumstances is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional support in a manner that is quick to set up and is reliably available during an emergency or crisis, which has been called by Hodges et al. (2020) 'emergency remote teaching' (ERT). But many studies show that e-learning is not the most preferred way of studying and only 10% prefer 'online only' as a form of teaching, while the blended formula is the most preferred, followed by face-to-face learning (EDUCAUSE, 2020; Anthony et al., 2020). Blended learning integrates face-to-face teaching with web-based learning, that entails the combination of different methods of delivery, styles of learning, and types of teaching. This approach has increasingly been adopted in higher education due to its advantages e.g. enhancing students' learning engagement experience; flexibility for students and lecturer; improved personalization; improved student outcomes; encouraging the growth of autonomy and self-

directed learning, creating prospects for professional learning, reduced cost proficiencies, increased communication between students and lecturer, and among students (Anthony et al., 2019, 2020). Most students prefer to attend classes even when offered online lectures, exercises, and intimate tutoring through electronic media (Harley et al., 2002; van der Wende, 2002), and also students in distance teaching institutions express a high demand for face-to-face interaction with academics and other students (San-Martín et al., 2020; Shea et al., 2017). Thus, after a few weeks of pandemic forced e-learning, we were wondering: what is the students' perception of this forced e-learning situation? As most of the current literature discusses the motivation and implementation of distance learning technology from teachers' perspectives (Murphy & Rodriguez-Manzanares, 2009; Albion et al. 2015), our approach is to examine the perception of students, who are the most important stakeholders of e-learning programs/educational offers. Also, other studies, although regarding blended learning (BL) in higher education, underline the role of perception of both students and teachers. For example, Anthony et al. (2019) reveal that the impact of BL on learners' effectiveness is positively predicted by achievement, engagement, involvement, retention, and cognitive outcome. Thus, we suggest that based on student feedback, we might provide HEI management with insights helpful in building educational policies that might promote students' positive perception of distance learning in turbulent times.

The most recent studies reveal that the ad hoc, technology acceptance model, information system success model, unified theory of acceptance and use of technology, and, lastly, diffusion of innovation theory are the theories most frequently employed by prior studies to explore blended learning adoption (Anthony et al., 2020). We would like to contribute in this regard, so to analyse students' perception of forced e-learning, we build on study demands - the construct from Job Demands Resources Theory (JD-R). The JD-R model was initially applied to the work context to predict employee well-being (Bakker &

Demerouti, 2017; Lesener et al., 2019) but has also been successfully used in educational settings (Schaufeli et al., 2002; Salanova et al., 2010; Stubb et al., 2011; Salmela-Aro & Upadhyaya, 2014). Many previous studies have also shown that JD-R theory could be successfully applied to describe the situation of students (Calderwood & Gabriel, 2017; Clements & Kamau, 2018; Kulikowski et al., 2019; Ouweneel et al., 2011; Robins et al., 2015; Teuber et al., 2020; Wolff et al., 2014; Zeijen et al., 2021). Therefore JD-R provides an empirically validated theoretical framework for the analysis of students' perception of e-learning. The JD-R model suggests that the most important aspect of the environment that negatively influences well-being are demands thus, in this study, we concentrated on study demands triggered by forced pandemic e-learning. As there is possibly an infinite number of different factors related to pandemic e-learning, we see it as important to guide our exploratory analysis with a well-validated theoretical framework and the JD-R model allows us to justify concentration on demands and thus validates and provides conceptual support for our approach. In a framework of JD-R, study demands might be seen as analogous to job demands as all aspects of study *"require effort and therefore are associated with physical and psychological costs"* (Bakker & Demerouti, 2017). Based on JD-R theory assumptions, we suggest that to fully understand the possible impact of COVID forced e-learning on students, it is vital to explore study demands generated by forced e-learning and investigate how those demands are related to students' perception of e-learning. To gain robust insight into the possible effects of e-learning on students, we decided to investigate the relationship between e-learning demands and the three categories of student e-learning perceptions: engagement in e-learning, students' emotional experiences with e-learning, and students' cognitive evaluation of e-learning. This multidimensional approach might be important as against a naive view, because humans' subjective perception of their lives is multidimensional (Diener et al., 2003; 2017; OECD, 2013; Kahneman & Deaton, 2010) and focusing on only one

aspect e.g. satisfaction from e-learning (i.e. the cognitive dimension of e-learning perceptions) might be too narrow and blur the whole picture of forced e-learning perception of students. In our approach the emotional experience of e-learning might be seen as the intensity of the emotional states triggered by e-learning, capturing how students react to e-learning and what they feel during e-learning e.g. *I feel angry when attending e-learning classes*. Whereas cognitive evaluation of e-learning refers to students' thoughts and judgments about e-learning, it concerns the broad appraisals of e-learning and its different facets e.g. *In my opinion, e-learning is an effective way of delivering new knowledge*.

In other words, in our model cognitive evaluation of e-learning is set to represent the reflective cognitive judgement about e-learning and emotional experience of e-learning is set to capture emotional responses to e-learning in terms of positive versus negative emotions (Diener et al., 2018). Moreover, to complete the picture of our study in the context of education we also include e-learning student engagement (for more discussion on study engagement see Ouweneel et al., 2011; Schaufeli et al., 2002) seen as a level of energy devoted to e-learning activities and enthusiasm from involvement in e-learning in comparison to traditional face-to-face learning.

Therefore, in this study, we aim to explore the e-learning demands that are most strongly related to the three dimensions of students' e-learning perceptions but we also aim to investigate how students' individual attributes are related to e-learning perception beyond e-learning demands. The JD-R theory assumes that not only the demands as environmental factors but also individual characteristics of people influence positive states of motivation, commitment, flourishing, and performance (Bakker & Demerouti, 2017). Based on JD-R, it might be expected that students' perception of e-learning depends not only on e-learning characteristics e.g. platform types, university policy, teachers' attitude and knowledge, etc. but also upon students' individual characteristics. Therefore, we also include the following

three individual attributes of students into our analysis: 1) students' opinions about e-learning feasibility as a teaching method, 2) study-person fit – the perception of compatibility of study profile with student interests, abilities, and expectations, and 3) personal resources, i.e. “*the beliefs people hold regarding how much control they have over their environment*” (Bakker & Demerouti, 2017).

In summary, in this exploratory study, we would like to answer the following research questions:

Q1 What are the most common demands related to COVID-19 forced e-learning experienced by students?

Q2 What e-learning demands and individual attributes of students are related to *study engagement* in COVID-19 forced e-learning?

Q3 What e-learning demands and individual attributes of students are related to *a cognitive evaluation* of COVID-19 forced e-learning?

Q4 What e-learning demands and individual attributes of students are related to *emotional experience* with COVID-19 forced e-learning?

These research questions need to be investigated to see what is the students' perception of e-learning in the midst of this Covid-19 outbreak. This is important both for students and for educational institutions because learning processes must be continued even with the various conditions and challenges that are affecting universities. Thus recognizing students' motivation and their individual attributes for the entire forced e-learning period is a challenge, but it is also vital and necessary to design a motivating and supporting environment as fostering motivation to learn.

The paper is organized as follows. The next section describes the methodology. Then we present results and answers to the four research questions. In a discussion, we relate our findings to other research studies and in conclusions, we point out our contribution to theory

and practice, our recommendations for research in this topic, and we list limitations and future research.

Method

Participants

The questionnaire survey was sent to 607 students from Wrocław University of Economics, 570 from Lodz Social Sciences Academy and 93 students of Jagiellonian University. They were all required by the university regulations to enrol on e-learning courses from 10th March 2020. The final sample consisted of 613 participants (423 women, 189 men, 1 chose the option other gender) with a mean age of 23.6 ($SD = 4.3$); 435 (71%) participants were studying at public universities and 178 (29%) at private ones; 452 (74%) were studying extramurally (on weekends) and 161 (26%) studied full-time; 496 (81%) declared that they were paying for their studies and 117 (19%) that they were not. The participants were from 3 universities in the following proportions: University of Social Sciences in Lodz – 179 (29%), Wrocław University of Economics – 402 (66%) and Jagiellonian University – 32 (5%), based on convenience sampling.

Measures

Emotional experiences with e-learning

We asked what feelings the e-learning evoked in respondents by asking them to place six emotional states, three positive: joy, excitement, content and three negative: anger, sadness, boredom on a four-item response scale: never, rarely, often, very often; these responses were recoded from 0 = never to 3 = very often for positive and 3 = never to 0 = very often for negative states. Cronbach's alpha = .801

Cognitive evaluation of e-learning

The cognitive evaluation of e-learning was assessed with a mean value from five questions: In general, how do you assess the way your university manages to ensure the continuity of

education during the suspension of classes due to the COVID-19 pandemic? (1 = unsatisfactorily to 5 = very good). How would you rate communication with the lecturers during distance learning? (1= very bad to 5 = very good). How do you assess the usefulness of the main IT system used in distance learning at your university (the so-called e-learning platform)? (1= very bad to 5 = very good). Messages issued by the university authorities about the distance learning organization provide me with all the information I need (1 = I definitely disagree to 5 = I definitely agree). How would you rate the effectiveness of distance learning during the COVID-19 pandemic in providing you with new knowledge? (1 = very low efficiency to 5 = very high efficiency) Cronbach's alpha = .862.

E-learning study engagement

To assess student engagement in e-learning, we used one question. *How do you assess your level of engagement in classes conducted in distance learning compared to face-to-face classes?* (on a scale from -2 = definitely lower to 2 = definitely higher)

Study-person fit

Study-person fit was measured with one question *How do you assess the compatibility of your study profile with your interests, abilities, and expectations?* 0 = the worst studies I could have chosen for myself to 10 = the best studies I could have chosen for myself.

Personal resources

Personal resources were measured with five items; optimism: I am usually optimistic about life; self-efficacy: I can solve most of the problems in my life if I put in enough effort; self-esteem: I am satisfied with myself; emotional stability: I think that I am an emotionally stable and calm person; openness: I think that I am a person open to new experiences; conscientiousness: I think I am a conscientious and disciplined person. In all items, the response scale ranged from 1 = I strongly disagree to 7 = I strongly agree. Cronbach's alpha =

.777. The personal resources measure was inspired by the Gosling, Rentfrow, and Swann (2003) short personality measures.

E-learning overload

E-learning overload was measured with one question: *I believe that during the currently introduced distance learning I have more learning-related responsibilities than I had in the previous face-to-face learning.* (1 = I definitely disagree, 5 = I definitely agree)

Table 1 presents descriptive statistics and correlations between the measures of perception of e-learning and students' individual attributes that support the validity of our measures, cognitive evaluation and emotional experience were positively related, showing that these two measures capture similar but distinct aspects of student perception of e-learning. Similarly, e-learning engagement was positively but weakly related to e-learning evaluation and emotional experience.

<< please insert table 1 here >>

E-learning feasibility

We asked students for the assessment of the feasibility of their field of study for distance learning with one question: *Given the specifics of your field of study, could your studies take place only in the form of distance learning?* With the response: Yes (320; 52%) or No (293; 48%).

Personal experience with educational technology

We asked about previous experience with distance learning with one question with three options: a) no experience at all (481; 78%), b) experience with blended-learning only (77; 13%), c) experience with the full online academic course (55; 9%).

Emergency/forced e-learning demands

To analyze the demands the students faced due to forced e-learning, we asked a multiple-choice question: *What are the biggest obstacles for you to continue learning in the distance learning mode?* The list of all demands used in this question is presented in Table 2. The list of demands was created based on a discussion among authors supported by their experiences as academic teachers in the face of COVID-19 emergency e-learning, and some preliminary students' opinions about their difficulties with e-learning. In this question we have also provided the option – “others” – to capture possibly omitted important demands not present on our initial list, only 56 participants (about 9%) provided answers using the “others” option. Among these 56 answers, responses from 10 participants differed so much that it was impossible to classify them into any coherent common demands and the remaining 46 responses were classified into one of the 5 demands: software and/or hardware problems, overload by e-learning activities, lack of teachers' engagement in e-learning, lack of one common e-learning standard/platform for every class, problems with the internet connection (see Table 2). The fact that less than 10% of respondents provided a response selecting the *others* option, and that this response was related to 5 demands only, might support the assumption that we have included most of the important demands in our list of demands.

Results

Q1 What are the most common demands related to COVID-19 forced e-learning experienced by students?

In Table 2, we present the frequency of a given demand and we also tried to classify demands into three categories depending on the demands' primary source. About 13% of students declared that they are not experiencing any demands related to forced e-learning suggesting that about 87% of students perceived at least one demand. This descriptive analysis offers us an insight into the nature of demands experienced by students during

COVID-19 forced e-learning. We assigned the available demands into three categories based on demands' sources: 1) demands stemming from academic teacher's behavior or attitude (AT), 2) demands coming from higher education institution policy & procedures, (P) and 3) demands stemming from the student's individual situation (S) – this category is presented in the last column of Table 2. As Table 2 shows, the two most often declared demand sources among our participants was AT and those are: a lack of information from the lecturers about what and how to learn and a lack of direct contact with the lecturers. The sources of the third and fourth most often declared demands are HEI procedures (P) and those are: chaos prevailing at the university and a lack of information from university authorities about changes planned in the organization of the academic year. Interestingly, the first student demand i.e. demand stemming from the student's individual situation is only eighth among most often reported demands and it is a lack of space at home (or other places of residence) where a student can participate in online classes with full focus and concentration.

<< please insert table 2 about here >>

As the next step, for answers to research questions 2 - 4 we created three regression models to analyze how demands faced by students during COVID-19 forced e-learning are related to study engagement (Q2), cognitive evaluation of e-learning (Q3), and emotional experience with e-learning (Q4). This analysis might allow us to establish the demand most strongly negatively related to students' negative experiences with e-learning. In each model, we also included students' individual characteristics to answer the question how individual attributes are related to a different dimension of e-learning perception. In this regression analysis, to avoid biases in regression models caused by too many not important predictors, we included only those demands that were reported by 5% or more of respondents (Table 2). We decided

that including non-frequent demands might unnecessarily complicate our model and reduce its robustness.

Q2 What e-learning demands and individual attributes of students are related to study engagement in COVID-19 forced e-learning?

As Table 3 shows, positive associations with students' engagement in e-learning was found for the assessment of e-learning as feasible ($b = .36, \beta = .17; p < .001$) and students' personal resources ($b = .14, \beta = .12; p = .003$). Among e-learning demands, negative associations with engagement were found for: a lack of space at home for study in full focus ($b = -.33, \beta = -.13; p = .002$), chaos prevailing at the university ($b = -.27, \beta = -.12; p = .007$) and a lack of direct contact with the lecturer ($b = -.21, \beta = -.10; p = .026$).

<< please insert table 3 about here >>

Q3 What e-learning demands and individual attributes of students are related to a cognitive evaluation of COVID-19 forced e-learning?

Results presented in Table 4 show that positive associations with cognitive evaluation of forced e-learning were found for study type ($b = .22, \beta = .11; p = .013$), assessment of e-learning as feasible in study field ($b = .32, \beta = .18; p < .001$) and study-person fit ($b = .06, \beta = .13; p < .001$), whereas negative association was found for institution type ($b = -.33, \beta = -.17; p < .001$).

For e-learning demands, negative associations with forced e-learning cognitive evaluation were found for: chaos prevailing at the university ($b = -.43, \beta = -.23; p < .001$), difficulty in communicating with the lecturers ($b = -.27, \beta = -.14; p < .001$), failure of e-learning programs/platforms provided by the university ($b = -.33, \beta = -.14; p < .001$), a lack of

information from the lecturers about what and how to learn ($b = -.22, \beta = -.13; p < .001$), a lack of skills among lectures to properly use software needed for distance learning ($b = -.25, \beta = -.12; p < .001$), a lack of information from university authorities about changes planned in the organization of the academic year ($b = -.15, \beta = -.08; p = .008$).

<< please insert table 4 about here >>

Q4 What e-learning demands and individual attributes of students are related to emotional experience with COVID-19 forced e-learning?

As presented in Table 5, the individual attributes associated with the emotional experiences with forced e-learning were positively related to assessment of e-learning as feasible ($b = .26, \beta = .21; p < .001$), personal resources ($b = .06, \beta = .10; p = .003$), and study-person fit ($b = .04, \beta = .12; p < .001$). Negative associations were found for institution type ($b = -.13, \beta = -.10; p = .019$) and a feeling of e-learning overload ($b = -.09, \beta = -.16; p < .001$).

The e-learning demands related to emotional experiences were: a lack of direct contact with the lecturers ($b = -.18, \beta = -.15, p < .001$), a lack of information from the lecturers about what and how to learn ($b = -.16, \beta = -.13, p < .001$), chaos prevailing at the university ($b = -.17, \beta = -.13, p < .001$), a lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration ($b = -.16, \beta = -.11, p = .001$), difficulties in learning how to use the software needed to participate in e-learning ($b = -.17, \beta = -.08, p = .012$), failure of e-learning programs/platforms provided by the university ($b = -.14, \beta = -.08, p = .017$).

<< please insert table 5 about here >>

Discussion

Table 6 presents a coherent summary of all demands and students' individual characteristics as predictors of three dimensions of forced pandemic e-learning perception: study engagement (those with $p < .05$), cognitive evaluation and emotional experience with e-learning. This table might help us to provide a summary and guide a discussion around our research questions.

<< please insert table 6 about here >>

As Table 6 reveals, our results show that students' perception of e-learning is not homogeneous and that three dimensions of e-learning perception are associated with different factors, thus creating a distinct nomological network (Cronbach & Meehl, 1955). As an example, the difficulty with communication with lecturers was a negative predictor for e-learning cognitive evaluation but not for study engagement or emotional experience with e-learning. Similarly, difficulties in learning how to use e-learning programs were related to more negative emotional experience with e-learning but not to a cognitive evaluation of e-learning or e-learning study engagement. These findings seem to support the validity of our multidimensional approach to the measurement of students' perception of e-learning and show the complexity of student e-learning perceptions.

The second interesting finding is that the demand related to all investigated dimensions of e-learning perception was students' beliefs that chaos is prevailing at the university. Interestingly, the most important demands were not problems related to hardware or software but chaos – a lack of information and dysfunctional communication at the university. This suggests that the most important part of emergency e-learning should not be providing students with up-to-date e-learning technology but providing them with

information, explanation, and coherent plans about the situation. Thus, when we think about e-learning, we usually think about different aspects of “e” technology as e-learning platforms and systems, whereas our findings have shown that possibly the most important aspects of e-learning might be constructive communication between the university and the students.

Bognar et al. (2015) also noticed in their study that although students belong to the generation of “digital natives” who have grown up with computers, video games, the Internet, and social networks, they are mainly raised by the generation of “digital immigrants” who speak an outdated language (that of the pre-digital age) and are struggling to teach a population that speaks an entirely new language.

The third insight from our results is the importance of individual attributes of students in e-learning perceptions. In every dimension of e-learning perception investigated in this study, i.e. emotional experience, cognitive evaluation, and study engagement, the students’ individual characters are of importance. Similarly, Klimenskikh et al. (2019) found that the characteristics of successful online students are their “personal equipment” such as intrinsic and extrinsic motivation and the level of intelligence or openness to a new experience. Other studies also support the argument that attitude, subjective norm, perceived behavioural control and self-efficacy influence students' intention to accept such teaching methods as blended learning (Anthony et al., 2020), where online teaching is a part of this process.

Particularly, our findings have shown that the belief of students that e-learning is a feasible teaching method in their study field was the individual attribute positively related to all three aspects of e-learning perception, beyond the actual demands created by e-learning. This suggests that from two students experiencing the same level of e-learning demands, the one who simply believes that e-learning is feasible as a learning method for his/her study fields might be more engaged, might experience more positive emotions, and might have a more positive cognitive assessment of e-learning. Other important individual predictors of e-

learning perception were person-study fit and personal resources. The student who believes that he/she fits well into his/her study field might perceive e-learning more favourably and might experience more positive emotions related to e-learning than a student experiencing the same e-learning demands but with the lower person-study fit. Also, students' personal resources "*the beliefs people hold regarding how much control they have over their environment*" (Bakker & Demerouti, 2017) were related to study engagement and emotional experience beyond e-learning demands. These findings suggest that students' perception and assessment of e-learning effectiveness are not only reliant upon e-learning technology and demands created by e-learning but also upon students' individual attributes which are not related directly to e-learning features themselves.

The fourth issue is the role and readiness of the institution which should be helpful and supportive while introducing remote teaching, especially during a crisis. This means that all procedures, instructions, a policy of delivering online teaching, the way of communicating, should be created specifically to establish the most convenient circumstances during the most challenging and critical times for higher education. According to Andoh et al. (2020), without student support services, distance education is not likely to be successful. E-learning readiness is related to connectivity, capability, content, and the culture of the relevant institution (Economist Intelligence Unit, 2010). Institutions should build a learning environment that fits instructors' needs and develops a creative, collaborative, secure, friendly, and up-to-date platform with quality interactions between learners and instructors. Institutional support for e-learning implementation has been reported to be important by participants at all levels (Linjawi & Alfadda, 2018). Also, Deuren and Lhaden (2017) and Fosu and Poku (2014) found that university environment, and administrative staff who were approachable, friendly and responded to the needs of students, significantly contributed to students' satisfaction during their online studies. Also, Vate-U-Lan found a positive correlation between attitudes

towards e-learning and satisfaction with life among students who had e-learning experience (Vate-U-Lan, 2020). Thus, apart from offering good system quality and technical assistance, the perceived positive impact of e-learning on organization is revealed to be a key to achieving teachers' and students' commitment to e-learning (San-Martín et al., 2020). Additionally, the research of Anthony et al (2020) concerning blended learning, also indicates that institutional structure, resource support, technology infrastructure, management strategies, and ethical considerations are key variables that positively predict administration readiness to diffuse blended-learning initiatives in higher education.

Implications for theory and practice

The implication of the study for theory and practice is based on assessing the significance of the pandemic for e-learning at universities.

From a theoretical perspective, our study made the first step towards better understanding how forced pandemic e-learning might be related to students' experiences with e-learning, thus contributing to an important debate on higher education after the pandemic. Also, our results highlight theoretical challenges related with the assessment of students' perception of e-learning, as we have shown the three different dimensions of e-learning perception might be seen as distinct and having different nomological networks (see Table 6), these pose a serious theoretical question as to how students' experiences with e-learning should best be evaluated.

It is likely that the pandemic will be fundamental to the wider application of e-learning to education at HEI's in the future. Whilst it is possible that perceptions of the forced transition to e-learning as chaotic, and not maintaining the quality of education, may result in a backlash in the form of a massive return of HEI's to face-to-face formats, it does seem that after some time, e-learning education, most often in the form of blended learning, once learned by all university stakeholders, will become one of the key methods of education.

Conclusions

The COVID-19 threat presented many challenges for higher education institutions, one of the most important being forced e-learning - the need to move education to an online environment. We do not know how long this COVID-19 forced e-learning will last or whether it will have to be used again, but what we know is that we might learn from this first experience to avoid the mistakes that were made and provide HEI managers with suggestions of educational policies that reduce e-learning demands experienced by students and promote students' positive perceptions of e-learning.

Drawing from an analysis of student feedback collected in this study, we might put forward a set of hypotheses on how to cope with the demands of forced emergency e-learning. As we presented an exploratory study this might be an inspiration for further research and should be carefully validated in further confirmatory studies.

First, we propose that when introducing emergency e-learning, there should be an initial attempt to concentrate on communication with students by informing them of the “what, when, and why of e-learning” to avoid the perception that the HEI is in a state of chaos caused by emergency e-learning. Second, we suggest that to avoid confusion and disinformation among students, academic teachers should clearly, and as fast as possible, update an e-learning course syllabus and personally inform students about what and how to learn. They should try to avoid overloading students with additional new work. Third, we submit that students should be provided with timely training and practice in using the software needed to participate in e-learning, it should not be assumed that they are “digital natives” and naturally know how to use it. Fourth, the focus should be put on fostering the process of reciprocal communication between academic teachers and students via computer-mediated means. Fifth, academic teachers should be provided with immediate training on how to properly use

software needed for distance learning. Sixth, we suggest that university authorities should provide students with regular and relevant information about planned changes in the organization of the academic year due to emergency e-learning. Seventh, care should be placed on the maintenance of e-learning programs/platforms to avoid their failure. Eighth, as students' individual characteristics (e.g. personal resources, perceived e-learning feasibility, study-person fit) seem to be predictive for student reactions to forced e-learning, as seen during the evaluation of e-learning, it might be important to take into account not only e-learning features but also controls for students' characteristics. Finally, our results suggest that different dimensions of student perceptions of e-learning, i.e. emotional experience with e-learning, cognitive evaluation of e-learning and students' engagement in e-learning, might be associated with different sets of predictors. Therefore HEI management interested in improving students' well-being during e-learning should take into account its multi-dimensional nature, carefully consider what dimensions they aim to address and be aware that different dimensions of students' perceptions of e-learning might need different actions.

Our findings presented in this paper are still preliminary and exploratory, but we hope they spark a debate and inspire replications in further empirical studies. First of all, there is a need for longitudinal studies about the perception of e-learning experiences by different stakeholders of HEI's. Emotional and cognitive evaluation of e-learning and study engagement should be assessed in conditions of forced e-learning and compared with experience after the pandemic and the return to campuses with the use of e-learning as one of the types of education. Second, future works should take into account the worldwide experience of students and academic teachers in the use of e-learning communication for change of dominant teaching modes in HEI's. It will be crucial to assess what will be the role of e-learning in future universities and what type of educational-mix will be strategically developed by different HEI's. Third, it is important to notice that in our study we concentrated

only on those students actively participating in distance learning, but some proportion of the student population, might not attend online classes because of a lack of internet access and/or necessary hardware, as such they are not visible in our sample and thus cannot add their experiences to our conversation. Therefore to avoid survivorship bias, i.e. ignoring the voice of those who for some reason were willing but unable to take part in distance learning, further research should also address the demands of those students who, due to moving education to online learning, were forced to quit their education or were temporarily unable to participate in it. Another factor limiting the generalization of our findings is that there was a significant proportion of part-time extramural students among our participants. Although we controlled for study type in our regression models it is nevertheless desirable to replicate our findings on a sample of full-time students. Among other limitations is also a lack of international comparative analysis of the perception of e-learning by students and the fact that we were not able to compare students' perceptions of e-learning during the pandemic with opinions collected before. Therefore we encourage researchers from different institutions and cultural contexts to replicate our findings and contribute to the discussion on what feedback students might provide for HEI management in times of pandemic to improve e-learning.

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Table 1.

*Correlations between the perception of e-learning and students' personal characteristics:
study fit, overload perception, and personal resources*

	Scale	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.
1. Cognitive evaluation of e-learning	1 to 5	3.20	0.86					
2. Emotional experiences with e-learning	0 to 3	1.34	0.61	.65**				
3. E-learning engagement	-2 to 2	-0.29	1.07	.33**	.41**			
4. Study-person fit	0 to 10	6.66	1.92	.13**	.14**	.10*		
5. E-learning overload	1 to 5	3.81	1.12	-.26**	-.34**	-.00	-.00	
6. Personal resources	1 to 7	5.60	0.95	.04	.11**	.15**	.26**	.07

Note. * $p < .01$; ** $p < .05$

Table 2.*COVID-19 forced e-learning demands*

Demands	<i>N</i>	%	Source
Lack of information from the lecturers about what and how to learn	274	44.7	AT
Lack of direct contact with the lecturers	267	43.6	AT
Chaos prevailing at the university	208	33.9	P
Lack of information from university authorities about changes planned in the organization of the academic year	176	28.7	P
Difficulty in communicating with the lecturers	172	28.1	AT
Constant changes in the rules of using e-learning during course introduced by lecturers	157	25.6	AT
Lack of skills among lecturers to properly use software needed for distance learning	144	23.5	AT
Lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration	142	23.2	S
Failure of e-learning programs/platforms provided by the university	103	16.8	P
X - I do not experience any difficulties related to distance learning	77	12.6	
Difficulty in contacting the university administration	75	12.2	P
No access to additional computer devices, e.g. microphone, camera, headphones	74	12.1	S
The need to share the computer with others, e.g. siblings, parents, children	63	10.3	S
Difficulties in learning how to use the software needed to participate in e-learning	59	9.6	S
No internet access	24	3.9	S
Lack of one common e-learning standard/platform for every online class*	16	2.6	P
No access to a computer	14	2.3	S
Lack of teachers' engagement in e-learning*	10	1.6	AT
Problems with the internet connection*	9	1.5	S
Overload by e-learning activities*	8	1.3	AT
Software and/or hardware problems*	3	0.5	S

Note. 100% = 613; *categories formed from responses to open ended question “other

difficulties” AT = academic teacher; P = Procedures & Policy created by Higher Education

Institution; S = student's personal situation

Table 3.

Student individual characteristics and COVID-19 forced e-learning demands as predictors of e-learning engagement

	<i>b</i>	<i>se</i>	β	<i>p</i>
Age	.01	.01	.04	.380
Gender (1 women / 0 men)	-.01	.09	-.01	.882
Study type (0 extramural studies / 1 full-time studies)	-.05	.16	-.02	.729
Private (0 no / 1 yes)	.03	.12	.01	.799
Study fee (0 no /1 yes)	-.09	.18	-.03	.602
Blended learning exp. (0 no / 1 yes)	-.03	.13	-.01	.816
Full e-learning exp. (0 no /1 yes)	.00	.15	.00	.980
E-learning feasibility (0 no /1 yes)	.36	.09	.17	.000
E-learning overload (1-5 scale)	.07	.04	.07	.093
Personal resources (1-7 scale)	.14	.05	.12	.003
Study-person fit (0-10 scale)	.04	.02	.06	.111
<i>e-learning demands</i>				
Lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration	-.33	.10	-.13	.002
Chaos prevailing at the university	-.27	.10	-.12	.007
Lack of direct contact with the lecturers	-.21	.10	-.10	.026
Lack of information from the lecturers about what and how to learn	-.18	.10	-.09	.060
Difficulties in learning how to use the software needed to participate in e-learning	-.25	.15	-.07	.093
The need to share the computer with others, e.g. siblings, parents, children	-.11	.14	-.03	.436
Lack of skills among lecturers to properly use software needed for distance learning	-.08	.11	-.03	.472
Difficulty in communicating with the lecturers	-.04	.10	-.02	.681
No access to additional computer devices, e.g. microphone, camera, headphones	-.04	.14	-.01	.786
Failure of e-learning programs/platforms provided by the university	.00	.12	.00	.973
X - I do not experience any difficulties related to distance learning	.05	.15	.01	.761
Difficulty in contacting the university administration	.07	.13	.02	.567
Constant changes in the rules of using e-learning during course introduced by lecturers	.10	.11	.04	.360
Lack of information from university authorities about changes planned in the organization of the academic year	.10	.10	.04	.315

Note. $R^2 = .12$; for all demands 0 no / 1 yes; R^2 coefficient of determination - the proportion of the variance in the dependent variable that is predictable from the all included predictors; e-learning engagement = students' self-assessment of engagement in classes conducted in distance learning compared to face-to-face classes; *b* = unstandardized regression coefficient; *se* = standard error of the unstandardized coefficient; β = standardized regression coefficient; *p* = p-values for regression coefficient.

Table 4.

Students' individual characteristics, COVID-19 forced e-learning and e-learning demands as predictors of e-learning cognitive evaluation

	<i>b</i>	<i>se</i>	β	<i>p</i>
Age	-.01	.01	-.04	.122
Gender (1 women / 0 men)	.10	.05	.05	.059
Study type (0 extramural studies / 1 full-time studies)	.22	.09	.11	.013
Private (0 no / 1 yes)	-.33	.07	-.17	.000
Study fee (0 no /1 yes)	-.03	.10	-.01	.804
Blended learning exp. (0 no / 1 yes)	.01	.07	.00	.866
Full e-learning exp. (0 no /1 yes)	.06	.08	.02	.431
E-learning feasibility (0 no /1 yes)	.32	.05	.18	.000
E-learning overload (1-5 scale)	-.01	.02	-.01	.821
Personal resources (1-7 scale)	.02	.03	.02	.549
Study-person fit (0-10 scale)	.06	.01	.13	.000
<i>e-learning demands</i>				
Chaos prevailing at the university	-.43	.06	-.23	.000
Difficulty in communicating with the lecturers	-.27	.06	-.14	.000
Failure of e-learning programs/platforms provided by the university	-.33	.07	-.14	.000
Lack of information from the lecturers about what and how to learn	-.22	.05	-.13	.000
Lack of skills among lecturers to properly use software needed for distance learning	-.25	.06	-.12	.000
Lack of information from university authorities about changes planned in the organization of the academic year	-.15	.06	-.08	.008
Difficulties in learning how to use the software needed to participate in e-learning	-.16	.08	-.06	.050
No access to additional computer devices, e.g. microphone, camera, headphones	-.14	.08	-.05	.067
Difficulty in contacting the university administration	-.12	.07	-.05	.089
Lack of direct contact with the lecturers	-.07	.05	-.04	.173
Lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration	-.08	.06	-.04	.163
Constant changes in the rules of using e-learning during course introduced by lecturers	-.07	.06	-.03	.255
The need to share the computer with others, e.g. siblings, parents, children	-.07	.08	-.03	.365
X - I do not experience any difficulties related to distance learning	.10	.08	.04	.211

Note. $R^2 = .58$; for all demand 0 no / 1 yes; R^2 coefficient of determination - the proportion of the variance in the dependent variable that is predictable from the all included predictors; cognitive evaluation of e-learning = student thoughts and judgments about e-learning; *b* = unstandardized regression coefficient; *se* = standard error of the unstandardized coefficient; β = standardized regression coefficient; *p* = p-values for regression coefficient.

Table 5.

Students' individual characteristics and Covid-19 forced e-learning demands as predictors of e-learning emotional experiences

	<i>b</i>	<i>se</i>	β	<i>p</i>
Age	.00	.00	-.01	.759
Gender (1 women / 0 men)	-.06	.04	-.05	.152
Study type (0 extramural studies / 1 full-time studies)	.00	.07	.00	.951
Private (0 no / 1 yes)	-.13	.06	-.10	.019
Study fee (0 no /1 yes)	-.03	.08	-.02	.732
Blended learning exp. (0 no / 1 yes)	.00	.06	.00	.965
Full e-learning exp. (0 no /1 yes)	.06	.07	.03	.408
E-learning feasibility (0 no /1 yes)	.26	.04	.21	.000
E-learning overload (1-5 scale)	-.09	.02	-.16	.000
Personal resources (1-7 scale)	.06	.02	.10	.003
Study-person fit (0-10 scale)	.04	.01	.12	.000
<i>e-learning demands</i>				
Lack of direct contact with the lecturers	-.18	.04	-.15	.000
Lack of information from the lecturers about what and how to learn	-.16	.05	-.13	.000
Chaos prevailing at the university	-.17	.05	-.13	.000
Lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration	-.16	.05	-.11	.001
Difficulties in learning how to use the software needed to participate in e-learning	-.17	.07	-.08	.012
Failure of e-learning programs/platforms provided by the university	-.14	.06	-.08	.017
The need to share the computer with others, e.g. siblings, parents, children	-.13	.07	-.07	.050
Lack of skills among lecturers to properly use software needed for distance learning	-.09	.05	-.06	.074
Difficulty in communicating with the lecturers	-.07	.05	-.05	.133
Constant changes in the rules of using e-learning during course introduced by lecturers	-.07	.05	-.05	.172
Difficulty in contacting the university administration	-.05	.06	-.02	.448
No access to additional computer devices, e.g. microphone, camera, headphones	-.05	.06	-.02	.469
X - I do not experience any difficulties related to distance learning	.00	.07	.00	.973
Lack of information from university authorities about changes planned in the organization of the academic year	.05	.05	.04	.297

Note. $R^2 = .41$; for all demand 0 no / 1 yes; R^2 coefficient of determination - the proportion of the variance in the dependent variable that is predictable from the all included predictors; emotional experience with e-learning = the intensity of the emotional states triggered by e-learning; *b* = unstandardized regression coefficient; *se* = standard error of the unstandardized coefficient; β = standardized regression coefficient; *p* = p-values for regression coefficient.

Table 6.

Summary of the results from three regression models – predictors of study engagement, cognitive evaluation, and emotional experience with e-learning

	e-learning engagement	e-learning cognitive evaluation	e-learning emotional experiences
Study type = full-time studies	0	+	0
Private institution = yes	0	-	-
E-learning feasibility = yes	+	+	+
Study-person fit	0	+	+
Personal resources	+	0	+
E-learning overload	0	0	-
Chaos prevailing at the university	-	-	-
Difficulty in communicating with the lecturers	0	-	0
Failure of e-learning programs/platforms provided by the university	0	-	-
Lack of information from the lecturers about what and how to learn	0	-	-
Lack of skills among lecturers to properly use software needed for distance learning	0	-	0
Lack of information from university authorities about changes planned in the organization of the academic year	0	-	0
Lack of space at home (or other places of residence) where I can participate in online classes with full focus and concentration	-	0	-
Lack of direct contact with the lecturers	-	0	-
Difficulties in learning how to use the software needed to participate in e-learning	0	0	-

Note. + = positive association in multiple regression; - = negative association in multiple regression; 0 = $p > .05$; Emotional experience with e-learning = the intensity of the emotional states triggered by e-learning; Cognitive evaluation of e-learning = student thoughts and judgments about e-learning; e-learning engagement = students' self assessment of engagement in classes conducted in distance learning compared to stationary classes