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PERSONALISED LEARNING AGAINST TECHNOLOGICAL FATIGUE

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Abstract

The research was devoted to presenting the students perception analysis of the online learning imposed during the COVID-19 quarantine period in spring 2020. In particular, the learners of different specialties were exposed to the selected methods of personalized learning in order to overcome the dwindling attention spans and educational apathy detected at the second month of the lockdown. The research goal was to analyse the implementation experiences of the personalized learning and teaching approaches towards the online learning issues, specifically against the technological fatigue. The survey sample involved 200 bachelor students of Sumy State University and Sumy National Agrarian University (Ukraine) and is representative in terms of demonstrating the issues range and the state-of-the-art of online teaching and learning of Ukrainian universities. The personalized learning requires not only teachers' professional skills to provide an efficient online course, fair assessment process and well-designed engagement activities, but also learners' readiness. The students must be ready for self-directed learning, prioritization, effective personal time-management, exploiting certain digital skills, etc. The research conclusions were delivered under the context of the student's feedback analysis at the end of the courses and analysis of their well-being during the unexpected and unplanned completion of the courses online. These data will be applied to improve the existing online courses designed by the authors before the pandemic and will serve as the basis for the further investigations in the field. The research paper highlights the importance of technostress reduction as a success prerequisite for modern education. Among the main findings was the current students' collision between the need to be constantly ultra-connected and yet suffering from the educational apathy and cynicism under the storm of information flow.

Keywords

Technostress. COVID-19. Apathy. Educational cynicism. Dwindling attention spans.

INTRODUCTION

The technology and Internet have shaped the lives of modern people so that we are now constantly plugged in. The reasons for this may be different: either fun or work. However, the increasing opportunities which may be gained via immediate connection and communication were the reason why this choice became a habit and a sensitive trend for the humanity. On the other hand, increasing opportunities almost automatically mean increasing responsibilities, free time shortening and, also automatically, a growing need or even demand to be online constantly.

This paper is not focusing on the economic features of the described trend, e.g. that a growing need to stay online pushes customers to buy more advanced devices and Internet package deals. We will focus on the phenomena of satisfaction of our needs using the online regime and an Internet access, especially the need for education. The paper is devoted to presenting the students perception analysis of the online learning imposed during the COVID-19 quarantine period in spring 2020.

The research question of what can help the learners to overcome the attention spans and technological fatigue, resulting in the educational apathy, has arisen when the authors were working as lecturers during the spring 2020 lockdown. First, the empirical information and then the communication with the learners of different years of studies revealed that even those students, who were highly motivated in the beginning of the lockdown, have lose their interest in the end. Even more, there were statements that some of them have perceived the lockdown as an opportunity to take the online courses/trainings/seminars for which they did not have time before. After April (a second quarantine month in Ukraine) there have already been students that marked their tiredness from being constantly online, from the need to focus on something that was somewhere in distance and even from the dismay that the knowledge they gain might not be needed in the future (because of the threat of future lockdowns). In April the authors were searching for the reason of this mood in the teaching methods and, thus, switched more to the personalized learning, but also they have explained it by the overall fear and uncertainty.

In the end of May the relevant survey was conducted in two universities in Ukraine among the students who were completing the courses during the quarantine. The survey results have demonstrated that the educational apathy, shortening of attention spans and overall low activity of the learner could also be explained of the extensive use of the electronic devices, shift of the communication of all kinds (even personal) online, as well as change in the mode of their online presence from voluntary to obligatory.

The use of the selected methods of personalized learning had helped to raise the active participation of the students and the overall level of their involvement. However, this could be noted mainly for the students who were active and motivated even before the lockdown. It means that at least in the analysed conditions of two mentioned universities the personalized learning did help to somehow overcome the dwindling attention spans and educational apathy detected at the second month of the lockdown.

There is a set of recent and comprehensive research and forecasts offered by such organizations as DAAD (COVID-19 Impact, 2020) that allow to understand the scale, trends and issues of the current higher education in the world in whole and some regions in particular. It should be noted that even at the global scale, not in an economic sense, UNESCO has recognized this quarantine 2020 timing as a crisis. From the educators' point of view, we would add that it is also a crisis of individual socio-emotional skills. It

is a skill to communicate only online, be able to express one's thoughts and emotions relevantly, experiencing difficulties in meeting new people and in refuse from social habits and needs. As a response to such large crises affecting all parts of life one needs "a great dose of resilience in dealing with uncertainty and change to living conditions" (Giannini, 2020). There has been a recent UNESCO study that has showed that "countries have heavily emphasized cognitive learning over social-emotional and behavioural learning" (Giannini, 2020). It can be explained by a certain absence of readiness of the teaching staff to perform at the same quality level online as they did it face-to-face. The most common feedback received from the colleagues was the need "to see the eyes" of those to whom one was teaching. The other challenge has been, as well as for the paper authors, to provide enough of interactive character of the lesson, to act in front of the camera and to make sure all the students were really listening. One of the interesting solutions, which has been offered by the master students who decided to keep themselves busy during the quarantine by applying for some kinds of remote jobs, was to record the lessons so that the learners could listen to them when they have time to really focus.

This mentioned decision has led us also to the issue of the technostress and technological fatigue: the working students were fully engaged online during the working hours and had to be exposed to more hours of listening to the recorded lessons. This is where the newly introduced (Secunda, 2019; Ornstein, 2019; Right to switch off, 2019) human right to disconnect came into action. The collision between the need to work and to study is not the subject of the university concern as it is a conscious choice of a student. The obvious solution from the teachers may be offering more personalized tasks and assignments for the practical classes (tutorials). Thus, the student will need to listen only to the recorded lectures if this allows the essences of the course and its curriculum. However, as a negative factor, the absence of the ethics of working online had negatively influenced the whole process of working and studying online. The students kept trying to communicate with their teachers after the working hours because it was more convenient for them, while the employers also kept sending emails and messages after the working hours. Some students noted that the whole day seemed to them as a never-ending conversation on a topic with their employer, while they often realized that in case of face-to-face communication the conversation could have lasted no more than 30-40 minutes.

It can be stated that modern working or studying people are impacted not only by the on-going exhaustion and stress from the technology-intense life (with tiredness and social disengaging as side-effects), but also from the speed of how fast the human must react and switch the reaction. As another side effect, there are studies that point out unhealthy food consumption (Kononova et al., 2018), sleep problems (Bener et al., 2018), emotional exhaustion (Xie et al., 2018) and a well-known information and communication technology overload (Lee, 2016). There have already been studies stating that fatigue may occur from a particular type of a digital application (Zoom - Daigle, 2020; Facebook – Bright et al., 2015; social media - Du et al., 2018), which does not always have social communicative background. The research of Fuglseth and Sørebø states that "factors that create and inhibit technostress affect both employee satisfaction with the use of ICT and employee intentions to extend the use of ICT" (Fuglseth and Sørebø, 2014).

According to a UNESCO report almost 70% of the world's students are not attending school (Education, 2020) this means that the solutions for the learners' experiences in online studies must be immediately advanced impacting nationwide. The crisis has set up the lifelong adaptive challenges not only for the higher education, but all the levels of it were also affected. More of that, the practice has demonstrated that an existing computer and MOOCs or distance learning supported environment did not fully meet those

challenges. One of the reasons was that both sides were affected by the pandemic consequences: service providers (universities, teachers) and their clients (students). And this is where the issue of individual's adaptive capacities comes out: The faster the university and the teacher could adapt, the faster they could help their students to do the same. In this regard, the personalized learning is a great tool to enhance "the individual's ability to be a competent, adaptive, active, goal-oriented and motivated learner" (Järvelä, 2006) which can work both sides.

It is interesting to note that in 2018 within the New Ukrainian school (junior level) an e-platform concept was developed (http://nus.inf.ua/). It allows a free access to the educational materials to pupils and their parents, as well as teachers from any schools and regions of the country. The platform can be marked by a user-friendly and a comprehensive approach to its design and was extensively used by the primary schools during the quarantine. As a result, the educators who were, in general, forced to confront some novelty and uncertainty of the lockdown online teaching at least at the primary school level had a familiar working environment.

As for the higher education domain, Commonwealth of Learning (Commonwealth, 2020) and other associations (e.g. IAU (Covid-19, 2020); EAIE (Staunton et al., 2020), etc.) and organizations (e.g. Google (Explore, 2020); UNESCO (Distance, 2020); EC (Coronovirus, 2020); World Bank (World Bank, 2020)) had developed their recommendation to keep up with the qualitative education including the lists of open and free learning resources. For example, those planning to begin their studies six months to a year from now "the second most popular option being enrolling in an online course or degree" (Gutterer, 2020).

There was even an International Partnership of Distance and Online Learning for COVID-19 established by the intergovernmental organizations, associations and universities and educational institutions (Commonwealth, 2020). This is another example of the need for shared expertise, pooled resources and enhanced collaboration under the crisis circumstances to act nationwide and worldwide. The mentioned EAIE's document (Staunton, 2020) provides the vision of how institutions can support students affected by coronavirus via mitigation of both health and academic impacts. Under the current circumstances of students' changing educational needs, personalised learning is an urge that is expected to foster their learning capacity (Bentley and Miller, 2004) and, as the experiences demonstrate, to decrease the technostress and fatigue from constant online "life". There is no such a diagnosis in the DSM-5 for this condition, however, a number of researchers, including those already mentioned, use the term "technostress" covering physical (e.g. headache, eye strain) and emotional (nightmares, mental fatigue) symptoms (Chiappetta, 2017; Brivio et al., 2015; Oh and Park, 2016; etc.).

The results analysis of the implementation experiences of the personalized learning and teaching approaches towards the online learning issues, specifically against the technological fatigue, are presented below.

METHODS

The above-mentioned considerations led the authors to design mixed-method research. In particular, the literature review was carried out in 2019-2020 using the planning, conducting, and reporting phases. A review protocol included the research questions set up, the design of the search strategy (e.g. the sources inclusion and exclusion selection criteria, the information analysis and synthesis, comparison with the results

obtained during own survey and empirical data collection). A total of 77 records were retrieved, including research papers, journal and conference papers, legal documents, official websites and respectable web-pages. These sources were analysed applying both inductive and deductive approaches, thus the review provides a systematic overview of the knowledge both from the current trends in the sphere of education under the COVID-19 pandemic, domains of technostress, personalized teaching and motivation for online education. The complete results formed the basis for understanding and explaining the case study results obtained after the survey.

The authors gained the data for analysis via several channels: 1) the survey of the students perception of their experiences of the online studies during March-May 2020, when they were finishing their courses and the quarantine lockdown was launched in Ukraine; 2) interviewing of the foreign students on the same matter, but with a shorter version of the survey, which took place closer to the end of the semester; 3) empirical observations of experiences of themselves (this includes the US teachers' experiences as well), their colleagues and their students throughout the lockdown. The research questions were answered using both the literature review and the gained data analysis.

The survey sample involved 78 random bachelor and master students of Sumy State University (SSU, 48 respondents) and Sumy National Agrarian University (SNAU, 30 respondents), Ukraine, which was launched via the Google Form manager. The questionnaire consisted of 20 questions with options to choose as an answer, the list of the questions is presented below:

1. Assess your desire to learn online at the beginning of quarantine lockdown (March 2020). Rate on a scale where 1 - had no desire 5 - was well motivated.

2. Do you have a stable Internet connection that allows uninterrupted online communication and video watching?

3. Does your hardware (computer, phone, tablet, etc.) allow your easy participation in online classes?

4. If you did not use a video camera during an online lecture, how often did you allow yourself to be distracted by other things? Rate on a scale where: 1- often did not listen, were busy with yourself... 5 - always listened carefully and watched the presentation.

5. How many additional online courses and trainings did you enroll into during the quarantine outside the university curriculum?

6. How many of the additional online courses and trainings have you completed during the quarantine?

7. When did you start feeling tired from online learning?

8. Estimate your motivation to learn online at the end of the semester. Rate on a scale where: 1 - had no desire 5 - completely satisfied.

9. Did you feel more stressed studying the courses taught online in English?

10. Can you say that the full online studying mode were stressful for you at some point?

11. How did you cope with your stress?

12. Did team collaboration, reflection and feedback help you cope with the stress of intensive online learning?

13. Which personalized learning methods that were applied by your teachers you benefited the most from?

14. What shortcomings in online learning have you found?

15. Do you think your teachers lacked the technical skills to work online?

16. Did the teachers have enough teaching and communication skills to work online?

17. What advantages in online learning have you found?

18. Can online studying in the future be an effective alternative to teaching in a classroom with a teacher?

19. Do you want to return to the traditional learning format sooner?

20. How do you feel about being evaluated by teachers based on the results of online learning?

The answers to these questions are representative in terms of demonstrating the issues range and the state-of-the-art of online teaching and learning of Ukrainian universities. The interviewing sample included 36 random bachelor and master foreign students from both universities and involved 7 (numbers 1, 2, 7, 11, 12, 14, 17 from the list above) questions. The analysis results were presented to the several groups of students trained by the authors for validation and in proportional comparison the newly obtained conclusions were confirmed by 96,2%.

RESULTS

The personalized learning requires not only teachers' professional skills to provide an efficient online course, fair assessment process and well-designed engagement activities, but also learners' readiness. The students must be ready for self-directed learning, prioritization, effective personal time-management, exploiting certain digital skills, etc. These abilities were questioned in the beginning of the lockdown by the paper authors when students started to demonstrate shortening of attention spans and overall low activity, which further evolved into an educational apathy. The chosen approach of personalized learning to reduce the technostress and online studies fatigue, required "the condition that the learners are capable to identify their needs themselves" (Leone, 2013). The university system in Ukraine does not provide the opportunity for the student's full autonomy, rather a managed by the teachers and the university studying path under the conditions of a disciplined study.

During the last few months, the educational researchers and institutions has been extensively discussing new pedagogical models, tools and approaches experienced by the academics of different scientific domains and countries (Reimers et al., 2020; Manzoor and Ramzan, 2020; Kapasia et al., 2020; Huang et al., 2020, etc.). The more the experience sharing was happening, the more the concern of the student's stress was rising. This led to the urge to define "the principle of high-quality students' participation and the need to relieve the students' anxiety in various ways" (Bao, 2020).

According to the survey (Fig.1), conducted in 2 Ukrainian universities among the bachelor and master students, who were exposed to finishing their courses under the lockdown, at the beginning of quarantine isolation 63% of students were enthusiastic about the idea of online learning and not attending classes in university classrooms, there were even 35% of them who rated their level of self-motivation as quite high and 28% - as a very high one.

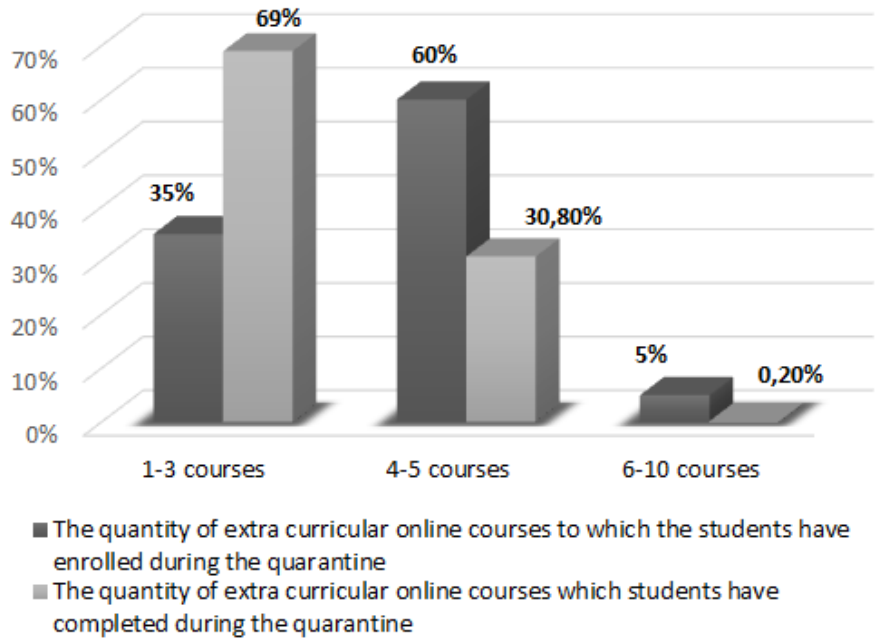

Figure 1: The changing level of motivation among the students during the spring lockdown 2020. (Source: Own)

During the quarantine isolation, many educational platforms provided free access to their courses, so many students took advantage of this opportunity. That is why some of them got enrolled in an impressive number of extracurricular educational activities (Fig.2): 60% of respondents signed up for 4-5 courses, however, only 30,8% managed to complete them.

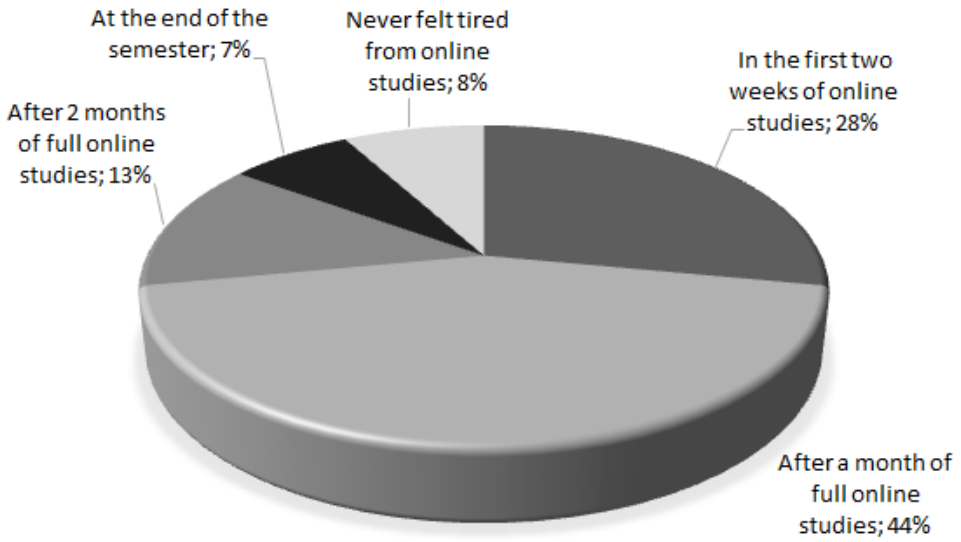

Figure 2: The number of extracurricular courses taken and completed by the students during the spring lockdown 2020. (Source: Own)

The figure also shows that the most successful graduates of additional courses are those students who enrolled only in 1-3 courses - 69% of them received confirmation of completion. This is where the learners were asked about the reasons for this.

First, there was a need to find out the technical capabilities of students: 29% of SNAU students are forced to face the problem of lack of Internet and search for it from other

sources (neighbours, friends or public Wi-Fi), which is less common among the students of Sumy State University. This is because many SNAU students come to study in the city from the village and were back at home during quarantine. Only half of the SSU students had problem with Internet connection. Also, 31% of respondents from both universities said that they had outdated hardware (computer, phone, tablet, etc.), which was why they had challenges connecting online.

During classes the authors have noticed that some students did not connect a video camera, so that a teacher could not see what the student was doing: learning the material or just pretending being present and being busy on their own. Of course, some of the students did not use the video due to the technical capabilities of the Internet and their technical means. However, within the survey 18% of respondents answered that they often did not listen at all and 49% enjoyed this opportunity from time to time. This meant that either the teacher was not capable of holding their attention or the students were not able to focus for so long.

It also happened because the students began to feel tired overall (Fig.3).

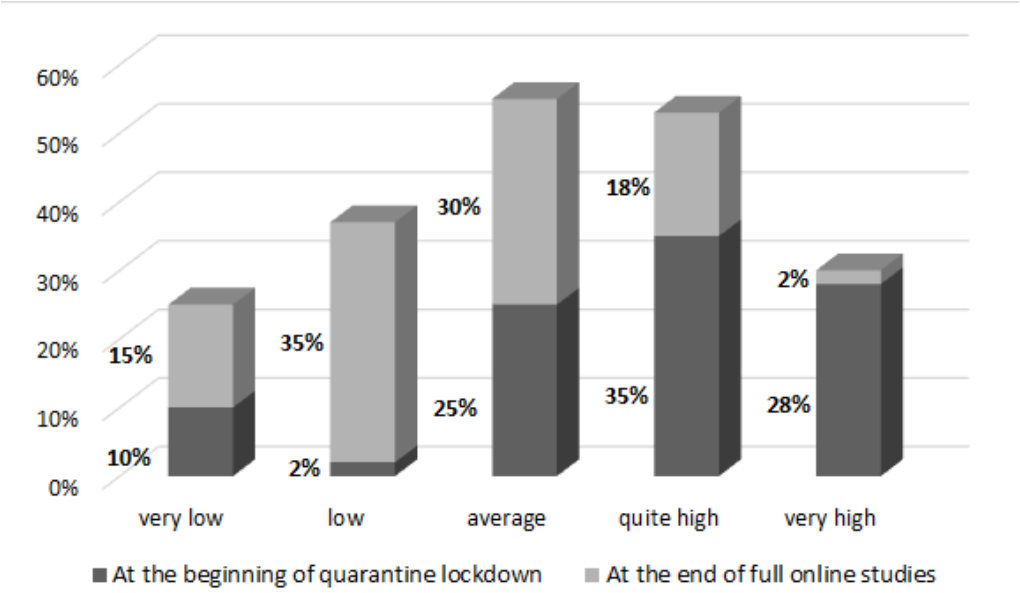

Figure 3: The share of tired students changing during the spring lockdown 2020. (Source: Own)

Thus, in the first two weeks of training, 28% of respondents began to feel tired, after a month of training another 44% added, and only 8% of students said they had never felt tired from learning online. As a result, at the end of training (Fig.1), only 18% of the students rated their level of self-motivation as quite high (compared to 35% at the beginning) and 2% as very high (compared to 28% at the beginning).

To sum up, 82% of surveyed students noted that the mode of full online learning, at some stage did stress them. This was even more challenging for those who studied in English: 62% stated that they felt more stressed when listening to the course online in English.

Among the methods by which students struggled with their growing technological stress, 52% admitted that they simply chose to miss some classes, preferring to work with textbooks, 17% - tried to reduce the time spent at the computer through social networks, and 31% - tried to go for a walk after the classes.

According to a lot of educators and researchers, "educators need to develop an educational environment that will appeal to the different learning styles of students" (Halim et al., 2010). Just a knowledge-intensive setting is not enough, as while studying constantly online learners start to require a motivating learning roadmap combined with appropriate learning and teaching strategies. Teaching itself must involve an extended task-related interaction with the involvement of intense reflection and feedback activities with students, which will help to make the process more personalized. Thus, the survey demonstrated that 27.5% of respondents agreed that the use of team collaboration, reflection and feedback helped them to cope with stress, and even thought that some students admitted that it required more of working online (31%). Yet, 41.5% of learners stated these tools did not manage to help them. The following personalized learning methods were marked as the most beneficial by the students: setting personal learning plans (42,4%), using project-based learning (54,8%), offering more learning pathways (41%).

To learn more about the background of this problem the questionnaire contained questions about the students' experiences and perceptions of the online studies. This is how among the shortcomings of on-line training, 43.7% noted that with this format of training it is difficult to gain practical skills in the subject, 27.1% of them lost motivation after a month of study (got an educational apathy), and 18.3% concluded that on-line learning does not develop communication skills due to the inability to communicate freely face-to-face. Among the advantages, 41% admitted the availability of educational materials, 38.4% - the ability to study anywhere, 20.6% - the opportunity to learn any time. Yet, 54.2% of students wanted to return to the traditional format of study as soon as possible, 28.7% - partially and 17.1% - were ready to continue their studies online. After all, a significant share of students recognizes the potential of online learning (Fig. 4): 42.3% believe that in the future it may become an effective tool for traditional education, while 14% do not consider online learning to be effective at all.

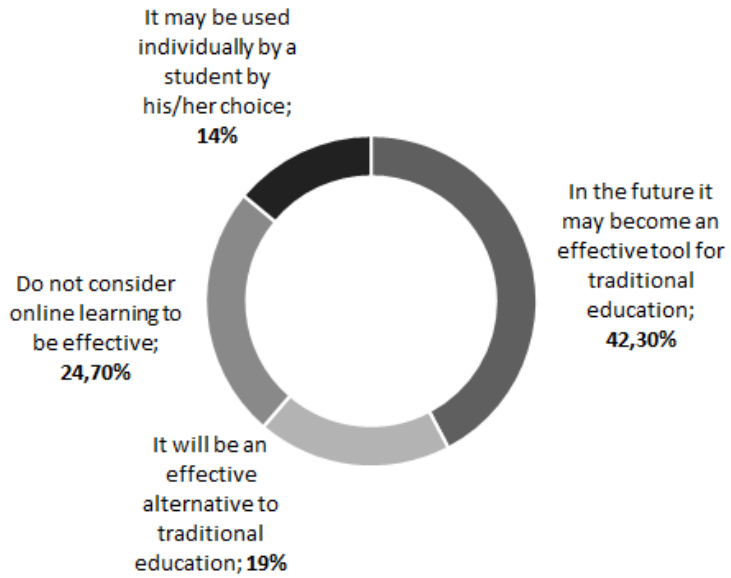

Figure 4: The students perception of the online education for the future after the spring lockdown 2020. (Source: Own)

Basing on the authors' experiences, the analysis of the online learning behaviour characteristics of students is crucial to personalised learning success. Having in mind that under the possibilities of regular pandemics and, consequently, lockdowns, conventional teaching may not be considered as effective enough anymore. A teacher gets a new role,

and it means new transitional problems. The survey has confirmed this: 20% of respondents noted that some teachers did not have enough technical skills or communication/pedagogical skills to work with them via Internet effectively. 59.5% of students said that their teachers had enough technical skills to work on-line, but they need to improve their teaching and communication skills to work on-line. Regarding the adequacy of teachers' communication and pedagogical competencies required to work on-line, 57.5% of respondents believed that they were satisfactory, yet needed to be improved. As a side-effect, 38% students stated that their knowledge assessments were not entirely objective, as there was no face-to-face communication.

Concluding the stated above and basing on the concept of successful intelligence (Sternberg and Grigorenko, 2000) to succeed in teaching online on a long-term basis, teaching for creative and practical skills must be integrated with teaching for strategic learning. Personalized teaching helps to explain the need of certain assignments and exercises for each student in a more related way. The use of the computers and a technology-based learning environment offers the opportunity of "just-in-time" support from the teachers. However, the rules for this interaction must be designed in order to increase the fruitful but not exhausting collaboration among teachers and students. In addition, the new methods of assessment tailored using the personalized learning approached will help to really learn about students' understanding of the material delivered online.

All the mentioned above conclusions were mirrored in the interviewing of the international students who possessed different values and cultural features yet experienced the same educational apathy because of the technological stress and fatigue from the constant need to be online. At the beginning of quarantine isolation 78% of international students at both universities were enthusiastic about the idea of online learning, while in the first two weeks of training, 48% of respondents began to feel tired and 22% more added after a month of training. They did not face technical problems (88% had stable Internet connection), however, even the team collaboration, reflection and feedback activities did not help them to overcome the stress from studying under the lockdown. Only 39% of the students skipped the classes and 10% tried to go for a walk. Most international students searched for the stress relief via online communication (51%). The admitted advantages of studying online (47% noted studying anywhere and 25% - anytime) did not prevent 60% of respondents from considering studying online as inappropriate for gaining practical skills.

DISCUSSION AND CONCLUSION

As an overall conclusion, a set of complex recommendations, which have demonstrated their effectiveness, are presented below:

1) making short interactive breaks via interactions with the students on the casual topics, making references to how they cope or about own experiences. The breaks even might include short physical exercises which require to stand up and do something away from the computer;

2) making the communication as possibly informal as it is allowed within the teachers' code of conduct;

3) do not contact the students at least after 19:00 in order not to add to their overloading with the devices communication;

4) send all the assignments and working emails to the students early in the morning, right before the start of the working day;

5) include the technology-free assignments which might need the use of the actual paper, handwriting, physical objects, etc.;

6) regular collection of the students' feedback on what helps namely them, accumulating information about certain academic groups and people in order to tailor teacher's communication with them in a personalized way;

7) exchange of the above-mentioned information with the colleagues in order to enrich the data set and vary the approaches;

8) set up flexible deadlines for students to fulfil big tasks: the deadline should have at least 2-3 stages with the decrease of the grade for certain number of points. The student may choose which deadline is more suitable for him/her in order to avoid stress.

9) permanent explanation during the classes that too much of the online activities may cause the technostress, tiredness and decrease in the educational motivation, drawing students' attention to the need to be aware of this problem and work with it.

The research conclusions were delivered under the context of the student's feedback analysis at the end of the courses and analysis of their well-being during the unexpected and unplanned completion of the courses online. These data will be applied to improve the existing online courses designed by the authors before the pandemic and will serve as the basis for the further investigations in the field.

The research paper highlights the importance of technostress reduction as a success prerequisite for modern education which apparently will significantly shift to online. Among the main findings was the current students' collision between the requirement to be constantly ultra-connected, which has already stopped being their voluntary choice, and yet suffering from the educational apathy and cynicism under the storm of information flow.

To sum up the research led us to the following conclusions of how the technological fatigue may be reduced and further overcome:

- Required skills to study fully online often demand their further development;
- Required guidance for students' learning skills and motivation improvement;
- Team collaboration, reflection and feedback is crucial for the long-term online university education;
- New requirements for the teachers were set up, e.g. new models of information delivery and knowledge assessment and they must be based on the approaches of the personalised learning.

It is a dilemma how a teacher who yet requires training him/herself will be able to create a new teaching and learning culture and even more – taking into consideration the needs of the diversified target groups: international students or students with special needs. The further research questions must lay in the domain of differentiating the specifics of teaching online of different age groups, cultures and subjects, as well as the extensiveness of the ICT use in the teaching process and involvement of real-world objects and processes to avoid the technostress.

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