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Blank screen – what lecturers face in remote teaching

Pusty ekran – czyli z czym mierzą się wykładowcy w nauczaniu zdalnym

Słowa kluczowe: nauczanie hybrydowe i online, HEI, problem w nauczaniu zdalnym.

Streszczenie: Ostatnie trzy lata przyniosły nauczycielom różnych szczebli wiele wyzwań. Jednocześnie jesteśmy świadkami dynamicznego postępu w rozwoju nowych technologii, co wiąże się również z ich nowymi zastosowaniami w nauczaniu. Zaowocowało to wzrostem wiedzy na temat zdalnego i hybrydowego procesu nauczania, ale ujawniło również nierozpoznane wcześniej luki badawcze. W artykule przedstawiono wyniki mające na celu wypełnienie luki badawczej poprzez rozpoznanie problemów dostrzeganych przez edukatorów i wynikających z nauczania online i hybrydowego. Problemy zostały rozpoznane dzięki międzynarodowym badaniom w ramach projektu HOTSUP. Lista zawiera problemy infrastrukturalne, techniczne, technologiczne i metodyczne, które zostały rozwiązane w dalszych etapach projektu.

Key words: hybrid and online teaching, HE, problems in distance learning.

Abstract : Last three years has brought numerous challenges to educators at various levels, and in the same time dynamic progress in dissemination of the teaching technologies. These resulted in the increase in knowledge on the remote and hybrid teaching process yet revealed research gaps unrecognized before. The paper presents the research aiming to fill in the research gap by recognizing problems perceived by educators and emerging from online and hybrid teaching. The problems were recognized thanks to international-range research within HOTSUP project. The list includes infrastructural, technical, technological and methodological problems that were addressed in the further stages of the project.

Introduction

The COVID-19 pandemic has changed the world in almost every aspect and sphere, affecting the way society, the economy and technology operate. Changes have also occurred in the education system at every level, forcing changes in the teaching methods and tools used. Some of these changes have become entrenched and now make it possible to teach using not only the presence of pupils or students in the classroom, but also remote communication tools with the whole spectrum of their capabilities. In addition, already proven solutions can also be used in other situations, enforcing remote or hybrid teaching. Moreover, mastering the tools can result in a higher quality educational process and greater sustainability. Economic factors (such as accommodation, commuting costs, etc.) or social factors (such as disability, illness or family problems) that previously limited educational opportunities have less impact on the educational process when it is delivered online, making it more sustainable.

While these changes undoubtedly contributed to a wider range of teaching methods and tools, they were not easy to implement. Implementing them into teaching practice required investing resources in the development of technological infrastructure (hardware and software) and the training of teaching staff. In the authors' view, teaching should focus on supporting knowledge acquisition as a cognitive process rather than improving the suite of technological solutions used. The answer to the problems noted above was to undertake the HOTSUP (HOListic online Teaching SUPport) project in an international team.

In relation to the above factors, it was important to carry out research to identify the problems perceived by lecturers in remote and hybrid teaching. Data for analysis was collected during structured interviews conducted by the project team among lecturers working at universities in 4 EU countries.

Challenges related with the hybrid and online teaching – literature review

Specificity of hybrid and online teaching

Performing any job entails developing certain ways of doing it. The profession of transferring knowledge to others is no different. Teachers who have been doing their job for years have proven solutions to make their teaching effective. However, when working conditions change, these solutions do not always have the desired effect or can still be used. In particular, this has been the case when, without significant and sometimes no preparation, it has been necessary to start teaching remotely (Rizun, Strzelecki, 2020; Arcos-Alonso, Arcos Alonso, 2021; Cicha et al., 2021).

Meetings using information technology have different requirements and specific characteristics. It is considered that online classes are those which are conducted entirely via the Internet. This means not only that they are discussed, but also that

materials are handed in by instructors and that completed assignments are handed in by students. Literature to be used by students also in this form must be available to them (Stevanović et al., 2021). Hybrid teaching, on the other hand, is a combination of the traditional form of teaching and remote meetings (Bennett et al., 2020). Consequently, this requires, as it were, a double preparation of the presenter in terms of the materials they use and the ways in which they present them.

Problems in distance learning

The interviews that form the research part of this publication were conducted exclusively with university teachers. Therefore, the problems associated with remote teaching were also presented exclusively from their point of view. The authors are aware of the difficulties that students also faced. However, due to the subject matter covered, these have been omitted.

Nowadays, teaching is increasingly being carried out with the support of various information technologies. The spectrum of choice here is very wide. This gives a wide range of possibilities for teachers and students to choose solutions, but at the same time poses a certain problem, as each teacher may require the use of a different tool. As a result, simply mastering the use of these tools requires meticulous preparation on the part of the students (Gonçalves et al., 2020).

Extensive research into the problems and obstacles that arise in remote learning was presented by the Collison team (Collison et al., 2020). They indicated that the main difficulty is to develop and maintain interaction between the instructor and the students at a level similar to the contact in classroom teaching. Due to the unlimited availability of materials, students may experience difficulty in organizing their work time and maintaining motivation to focus on the issues they need to master (Kruszewska et al., 2020). Most of the problems identified are related to technology – lack of appropriate equipment, insufficient skills to operate it (Marek et al., 2021), Internet access or its quality. Exactly the same problems are listed as key issues by other authors (Cicha et al., 2021). They point, in particular, to the inadequate technological infrastructure, the lack of experience of instructors in delivering classes remotely, and the lack of information about potential, implementable solutions (Zhang et al., 2020). This is particularly important in laboratory classes where experiments are required, in subjects such as physics, chemistry or drawing (Nuere, de Miguel, 2020).

The literature also draws attention to problems of a different nature, related not so much to insufficient skills in the use of IT tools, but rather to interpersonal communication (Lyamin, Romanova, 2021). The most common reason for this is the difficulty in establishing a dialogue with students, which does not allow for feedback on the level of understanding of the material presented. Classes conducted remotely limit contact not only with the instructors, but also between students themselves. They know little or nothing about each other and, as a result, group assignments are very difficult to implement.

A comprehensive study on the challenges and difficulties of remote teaching was conducted at the NAES of Ukraine. As a result, the following problems faced by the instructors and their students were identified (Ivaniuk, Ovcharuk, 2021):

- insufficient material and technological support of students;
- lack of Internet quality;
- lack of time due to increased workload for teachers;
- insufficient level of material and technological support from educational institutions;
- low level of students' self-organization and motivation;
- insufficient level of teachers' digital competence;
- psychological difficulties during distance learning;
- decreasing level of quality of educational services.

Their summary is broadly in line with the conclusions of other authors and their research findings (Kryshtanovych et al. 2020; Williyani, Sirniawati 2020; Raitina et al. 2021; Klochko et al. 2021; Belousova et al. 2022). The first area is technological in nature. In each case, problems related to the ability to use the equipment necessary to deliver classes remotely are highlighted. Difficulties with Internet access are also highlighted. The second area of difficulty can be seen as the broadly defined withdrawal of students from establishing interactions with both instructors and other students.

Context and method of the research

HOTSUP Project

The problems of distance learning identified in the literature and in authors' own experience inspired not only our own research in this area, but also the development of a tool to assist educators in solving them. This was supported by the HOTSUP project – HOlistic online Teaching SUPport.

The overall aim of the project is to improve the skills of educators in higher education institution (HEI) to enable them to develop digitized training content promoting equal opportunities for students enrolled in virtual and extended classroom courses. The specific objectives include:

- improving / innovating online learning to meet the needs of higher education while conducting training in virtual and extended classrooms,
- promoting the combination of pedagogical, technical and technological aspects in the redesign of the training course,
- improving the skills of lecturers in the three above-mentioned aspects, considered individually and in mutual interactions.

In order to meet the challenge of remote education and to bridge the gap between classroom and virtual lessons, academic teachers should receive support in developing their skills and introducing innovations in three dimensions: pedagogical, technical and technological.

Research methodology

One of the steps necessary for the HOTSUP project was to gather the views of HEI educators on the challenges of hybrid and online teaching. Twelve educators participated in the interview, three each from the 4 partner countries (Poland, Spain, Italy and Slovenia). Respondents were purposively selected due to the following criteria:

- lecturing experience of at least 5 years,
- teaching in a variety of formats – lectures, exercises, labs,
- variety of student participation in classes – online, hybrid, stationary,
- willingness to participate in research for the HOTSUP project,
- English language skills.

The research was conducted in February-March 2022. A separate online appointment was made with each respondent and usually 2 members of the project team attended. One interview lasted a maximum of 2h.

The in-depth interview had a set scenario that was based on a question: What are potential problems and threats emerging from hybrid/hyflex classe? According to the interview methodology, the exact questions to be asked are not pre-determined; the order and formulation of the questions is decided by the interviewer, who may also pose additional questions (Miński, 2017, p. 32–33; (Mandes, 2008; p. 137-138; Guion et al., 2011; Turner, 2010; Rowley, 2012).

Later in the interview, respondents were asked to indicate values from a scale of 1-6 for each of the separate, aggregated groups of variables in relation to the following questions:

- What is probability of such event? (1 – probability close to 0; 6 - almost certain),
- What is probability of detection of that event? (1 – probability close to 0; 6 - almost certain),
- What is the impact on student? (1- has no effect; 6 - has a very large impact),
- What is the impact on teacher? (1- has no effect; 6 - has a very large impact),
- What is the impact on education process? (1- has no effect; 6 - has a very large impact).

A scale of 1 to 6 ratings was used due to the need to eliminate the answers don't know, don't have an opinion. This modification may have taken place due to the expertise that respondents had (Joshi et al., 2015).

This part of the study was followed by an analysis and synthesis of the results obtained. The type of classes taught was also taken into account, considering two categories: lectures and others (laboratories, projects, exercises). The responses received were aggregated and 14 groups of factors influencing the delivery of hybrid and online classes were separated. The mean, median minimum and maximum were then calculated for the responses received. Respondents were provided with the collated data again and asked to revise their scores - leave their results or make a change with justification.

The study findings

Analysis and aggregation of the data collected during the interviews

Due to the form of research adopted – the interview – it was very important to analyse and collate the information obtained. The transcription of the interviews is already a preliminary form of organizing the collected material. It is assumed, however, that the actual analysis comes later. The biggest challenge was to develop an appropriate method of selecting information to avoid being overwhelmed by the amount of verbal data to be analyzed. The most common data aggregation strategies are segregation by question or segregation by topic (Miński, 2017, p. 32–33).

During the analysis conducted, a strategy was chosen to organize the information collected during the interview by themes. Finally, 14 disjoint groups of variables influencing the delivery of hybrid or online classes were separated. The results of the synthesis are presented in Table 1.

Table 1. Groups of variables and the wording assigned to them

No	Problem name	Selected description collected during interviews
1	infrastructure	infrastructure failure (internet connection, computers, etc.) problems with infrastructure Internet connectivity bad internet connection access to infrastructure (students) loss of connection - physical (technical problem) technical delay makes it difficult to provide fluent conversation
2	lack of interaction and communication with students	reduced social interactions of students with teachers lack of interaction and communication with students low feedback in classroom and online lack of student's engagement lack of student's maturity (they do not participate actively in classes) reduced social interaction among students
3	classroom management	reduced effectiveness of the learning process classroom management (too many sources of data/information you have to keep an eye on) problems with class management (it is difficult to deal with students)
4	adapting teaching approach to digital	need to adjust teaching methodology selecting the wrong methods of teaching (especially for the first meeting) adapting teaching approach to digital

No	Problem name	Selected description collected during interviews
5	lack of focus and attention	lack of attention lack of focus and attention (students do all the things except from listening/participating in the classroom) less control on the results of students (what they know and can do) during hybrid classroom noise (from online and regular students) lack of focus and attention (students do all the things except from listening/participating in the classroom)
6	cyber security, privacy, ethical implications	cyber security cyber security (cheating, recording) security of data privacy issues (cameras during exams - show private rooms etc.) ethical implications (misuse of recorded content) ethical issues (recording)
7	diversity of technological solutions	diversity of technological solutions (switching between platforms) presentation/equipment is not working in the platform (works on regular computer but not in virtual classroom) using some specific tools (drawing etc.) online software licenses - necessity to use open source
8	inadequate level of technical and technological skills	inadequate level of technical and technological skills lack of technical (IT) competencies lack of technological background (senior educators) problems with IT competencies (especially senior educators) lack of mutual interactions between technological, technical and pedagogical skills
9	less active and participative student	students connected online are less active and participative students do not ask question less communication missing contact between the teacher and the students control over students work (sharing screen takes time) unrecognized loss of attention unsolved tasks or exercises of online students (they get lost and are afraid to ask)
10	irresponsibility of online students	students stay at home and do not feel the responsibility and obligation connected with studying irresponsibility of online students low participation due to a sense of inadequacy caused by a lack of necessary skills and abilities for online study and learning frustration related to online study
11	some content is difficult to explain online	some content is difficult to explain online difficulties in applying education to teaching topics adding information to remote lectures, because the lecture lasts shorter uneven teaching pace (difficult to translate) equation to the weakest - student with Smartphone

No	Problem name	Selected description collected during interviews
12	small support from the institution	lack of support from the institution (technological and methodological) resistance to change lack of knowledge in the field of educational technology prevalence of the use of didactic erogative lack of experience: hybrid/hyflex requires more experience
13	hardware availability	hardware availability access to peripherals (hardware) of comparable quality the need to set up a server for remote access the need to have very good equipment on the university side (e.g. wide-angle camera, microphone plugged into the lapel, loudspeakers in the room) technical problems on the part of students (e.g. turning on the camera spoils the sound)
14	difficult collaboration	lack of the community feeling of isolation poor level of rationality caused by a variety of psychological aspects, such as a sense of loneliness, feeling of abandonment, difficulty in integrating into a group, difficulty in interacting with lecturer/tutor and with other students

Source: Own preparation.

The analysis results presented above are based on 12 interviews in which each respondent identified at least eight factors that have been or continue to be a problem when teaching online or hybrid classes.

Simple statistical analyses for the data obtained

First, an analysis was performed that indicated how many how many educators from HEIs perceived a problem in a given group of factors. Table 2 shows the number of HEIs that identified variables in the group as problematic.

Table 2. Number of indicated factors in each group

Problem name	Number of answers
infrastructure	10
lack of interaction and communication with students	9
classroom management	8
adapting teaching approach to digital	8
lack of focus and attention	8
cyber security, privacy, ethical implications	8
diversity of technological solutions	7
inadequate level of technical and technological skills	5

Problem name	Number of answers
less active and participative student	7
irresponsibility of online students	5
some content is difficult to explain online	5
small support from the institution	5
hardware availability	5
difficult collaboration	4

Source: Own preparation.

Analysing the data received, it is noticeable that the most problems were noted for: infrastructure, lack of interaction and communication with students, classroom management, adapting teaching approach to digital, lack of focus and attention, cybersecurity, privacy, ethical implications.

The next step is to count simple statistics such as mean, median, minimum and maximum. These are typical statistics that are counted for variables in Delphi studies, and this is how the second part of the interviews can be treated. Such results were sent to the respondents, who were allowed to change their ratings. Respondents felt there was no need to do so. The results for the total respondents are shown in Tables 3–7.

Table 3. Basic statistics for the problem name, question: What is probability of such event?

Problem name	Average	Median	Min	Max
infrastructure	3.4	3.5	1	5
lack of interaction and communication with students	4.7	5	3	6
classroom management	3.8	3.5	3	5
adapting teaching approach to digital	4.1	5	1	6
lack of focus and attention	4.1	4	2	6
cybersecurity, privacy, ethical implications	4.6	5	2	6
diversity of technological solutions	3.4	3	2	5
inadequate level of technical and technological skills	4.4	5	3	5
less active and participative student	5.3	5	5	6
irresponsibility of online students	4.2	4	3	6
some content is difficult to explain online	5.4	5	5	6
small support from the institution	3.2	3	2	4
hardware availability	3.4	3	1	6
difficult collaboration	5.0	5	4	6

Source: Own preparation.

In the opinion of the lecturers, the probability of a given difficulty (average of 5 or more) is highest for the following problems:

- some content is difficult to explain online,
- less active and participative student,
- difficult collaboration.

The difficulty of explaining content in online-only classes relates mainly to classes where students should acquire practical skills (labs, projects, exercises). The main difficulty stems from the fact that not everything can be done online, the need to explain issues for a longer period of time because they cannot be experienced, and there is uneven teaching due to lack of student feedback as well as equipment problems.

In classes where the participants are online it is very likely that the students will be less active. This manifests itself in a lack of questioning, a lack of discussion, a lack of feedback, which is also not recognizable through body language or other non-verbal behavior (even the camera image, if there is one, is often distorted).

A lack of collaboration is noticeable in online or hybrid classes. Students report a lack of community, a sense of isolation, anonymity. Under such conditions, it is very difficult to achieve the learning outcomes associated with group work and building collaborative relationships when completing tasks together.

Table 4. Basic statistics for the problem name, question: What is probability of detection of that event?

Problem name	Average	Median	Min	Max
infrastructure	5.0	6	1	6
lack of interaction and communication with students	4.7	5	1	6
classroom management	4.8	5	3	6
adapting teaching approach to digital	5.0	5	2	6
lack of focus and attention	4.4	5	1	6
cybersecurity, privacy, ethical implications	4.9	6	2	6
diversity of technological solutions	5.7	6	5	6
inadequate level of technical and technological skills	4.4	4	4	5
less active and participative student	4.9	6	1	6
irresponsibility of online students	4.0	4	2	6
some content is difficult to explain online	5.6	6	4	6
small support from the institution	5.2	6	3	6
hardware availability	4.6	5	2	6
difficult collaboration	5.8	6	5	6

Source: Own preparation.

Another issue raised was the probability of detecting the possibility of such a difficulty arising. In the opinion of the lecturers, the highest probability (average of 5 or more) that a problem occurred during the class are problems related to:

- difficult collaboration,
- diversity of technological solutions,
- some content is difficult to explain online,
- small support from the institution,
- adapting teaching approach to digital,
- infrastructure.

The likelihood of detecting the above difficulties is most readily apparent as it relates to the conduct of the lecturer himself and the university's support for him or her, or the student and his or her problems with class participation.

Table 5. Basic statistics for the problem name, question: What is the impact on student?

Problem name	Average	Median	Min	Max
infrastructure	5.4	6	2	6
lack of interaction and communication with students	4.6	5	2	6
classroom management	4.6	4.5	3	6
adapting teaching approach to digital	3.1	3.5	1	5
lack of focus and attention	3.8	3.5	2	6
cybersecurity, privacy, ethical implications	4.6	5.5	1	6
diversity of technological solutions	4.3	5	1	6
inadequate level of technical and technological skills	5.0	6	3	6
less active and participative student	4.6	5	1	6
irresponsibility of online students	3.0	3	1	4
some content is difficult to explain online	5.4	6	3	6
small support from the institution	5.0	5	3	6
hardware availability	4.8	5	3	6
difficult collaboration	3.8	3.5	2	6

Source: Own preparation.

The next concern was the potential impact of a particular difficulty on students. In the opinion of the lecturers, the greatest (mean of 5 or more) impact on the quality of student participation in online or hybrid classes is:

- infrastructure,
- some content is difficult to explain online,
- inadequate level of technical and technological skills,
- small support from the institution.

Problems with access to the right infrastructure (e.g. laboratories at the university with the right equipment) and little support from the university, especially at the

beginning of remote work, have the greatest impact on student learning outcomes. The difficulty of explaining some content online is of considerable importance during learning. The most surprising finding is that students have an insufficient level of technical and technological skills, as shown by students' problems related to not knowing how to install software or not knowing what software is needed.

Table 6. Basic statistics for the problem name, question: What is the impact on teacher?

Problem name	Average	Median	Min	Max
infrastructure	4.7	5	2	6
lack of interaction and communication with students	3.8	3	2	6
classroom management	4.8	5	3	6
adapting teaching approach to digital	4.3	4.5	1	6
lack of focus and attention	4.0	4	1	6
cybersecurity, privacy, ethical implications	4.9	5.5	1	6
diversity of technological solutions	4.3	4	1	6
inadequate level of technical and technological skills	5.6	6	4	6
less active and participative student	5.0	5	2	6
irresponsibility of online students	5.4	5	5	6
some content is difficult to explain online	5.0	5	3	6
small support from the institution	4.6	4	4	6
hardware availability	4.0	4	2	6
difficult collaboration	4.8	5	3	6

Source: Own preparation.

The results of the analyses showed that the greatest (mean of 5 or more) potential impact of a given difficulty on the lecturer is:

- inadequate level of technical and technological skills,
- irresponsibility of online students,
- some content is difficult to explain online,
- less active and participative student.

The insufficient level of technical and technological skills affects teachers to a very large extent, as students ask them to help them solve their technical problems. This action often breaks up the class, as the lecturer is forced to solve the problem instead of teaching the class and shaping the students' correct skills. Such problems are surprising in a world where young people should be able to navigate all sorts of software and the Internet without problems.

Among the student behaviours that highly affect the teacher is the irresponsibility of online students. It manifests itself in students not respecting deadlines, not seeing the point of sitting in front of a computer, transferring their frustration of learning online to the lecturer. These are unpleasant situations for both parties.

The next two problems are related. The difficulty of delivering online content is exacerbated when there is little or no student engagement during class.

Table 7. Basic statistics for the problem name, question: What is the impact on education process?

Problem name	Average	Median	Min	Max
infrastructure	5.3	6	4	6
lack of interaction and communication with students	4.2	4	3	6
classroom management	4.4	4	2	6
adapting teaching approach to digital	3.9	4	1	6
lack of focus and attention	4.0	4	2	6
cybersecurity, privacy, ethical implications	3.9	4	1	6
diversity of technological solutions	4.1	5	1	6
inadequate level of technical and technological skills	5.2	6	4	6
less active and participative student	5.3	5	4	6
irresponsibility of online students	5.0	5	4	6
some content is difficult to explain online	5.0	5	3	6
small support from the institution	5.6	6	4	6
hardware availability	3.4	4	1	5
difficult collaboration	4.8	5	3	6

Source: Own preparation

The greatest (mean of 5 or more) potential impact of a particular difficulty on the learning process is associated with:

- small support from the institution,
- infrastructure,
- less active and participative student,
- inadequate level of technical and technological skills,
- irresponsibility of online students,
- some content is difficult to explain online.

It seems that three of the problems outlined are starting to disappear as both universities and current and prospective students have the right equipment and their technical skills related to the use of remote communication tools have increased due to their widespread use. Low student activity during classes and lack of student responsibility during online or hybrid classes remain a problem. In terms of sharing and quality of online content, this is improving, as well as for key classes care is being taken with stationary.

Discussion

The problem of the organizational support of the educational process by means of the availability and convenience of the administrative system and staff has been

already noticed as important by Pozdnyakova (2017) in their research on distance learning anticipated by adult students. Similar issue defined generally as technical problems was pointed as the most important during first year of COVID-19 pandemic by (Klochko et al., 2021). This is in good agreement with numbers of answers which reached 10 in problem related to infrastructure although at the same time the problem with too little support from the institution was noted only by five (see Table 2). It seems that educators distinguished explicitly needs for better infrastructure which finally define need for better support in exploitation and application to the educational needs in classrooms.

A significant problem pointed out during interviews was lack of interaction and communication with students which can be generalized as lack of socialization not only between students but also with educators. That issue was also anticipated by Pozdnyakova (2017) in their research on distance learning anticipated by adult students. The issue of socialization might be related also in some extent with need of privacy and cyber security. These problems can be related to:

- the lack of direct contact between student and educator Pozdnyakova & Pozdnyakov, 2017;
- problems associated with feeling of alienation and isolation from the student community (Pozdnyakova & Pozdnyakov, 2017);
- problems associated with fears and concerns regarding the correctness of education process and gained knowledge or skills (especially with respect to laboratory or project classes) Pozdnyakova & Pozdnyakov, 2017);
- anxiety about data privacy, cyber security and ethic implications (Cinar & Torenli, 2010);
- anxiety about insufficient amount of educational materials (Belousova et al., 2022).

In literature it is reported that university students express their doubts and anxiety to technical difficulties, communicative deficits in teaching and insufficient amount of educational materials (Belousova et al., 2022) which is expressed by our responders by the fact that there is diversity of technological solutions (7 answers in Table 2) with inadequate level of technical and technological skills (5 answers in Table 2). These issues are reflected by the high average marks reported in Table 3. It can be related to the need of transferring not only the knowledge but also the skills with ad hoc hardware and software solutions proposed and used by educators, which might vary significantly between educators, therefore causing a need of student's familiarization with broad spectrum of tools and associated methods. Therefore, causing difficulties for students in collaboration among various educational platforms, software, and other IT-tools required for some or specific courses, even within the same institution. This has been also noticed by (Klochko et al., 2021; Oliynyk et al., 2021) pointing that institutions actions are fragmentary, conceptual in nature, and require consideration depending on the size of the educational organization, the crisis situation, and aspects of the activity. All these might lead to

less active and difficult participation of students in courses, although their detection is highly possible which is reflected by results reported in Table 4.

Conclusion

From the presented results it is obvious that educators in HEIs are aware of the issues which influences the wellbeing of education processes. Despite the various raised problems in that research, the most significant can be summarised in following points:

- 1) Inadequate infrastructure with relatively little problems related to hardware availability, which can be highly correlated with inability/or high difficulty to explain some content in online or hybrid modes.
- 2) Lack of adequate level of technical and technological skills of students as well as educators.
- 3) Lack of methodological knowledge and skills of educators with respect to online and hybrid teaching.
- 4) Need of standardization of used technical and technological tools, especially in terms of software and IT systems, at least at institutional level.

It is evident that increase of expenses on infrastructure and all hardware needed for the online, hybrid or any remote teaching would be considered as useless without adequate institutional support on improvement of methodological and overall IT-skills of educators and students. Higher education decision-makers have to tackle all these four issues holistically in order to assure sustainable development of higher educational institutions.

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