

# Remote Learning. Taming the (Un)known

Impact of COVID-19  
on higher education



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# Summary of the report



- 1** Among the factors whose impact on the effectiveness of remote learning has been analyzed so far are, i.a., aspects related to the quality of teaching, tools used to hold the classes, educational materials, services, and the student's attitude. The importance of the above factors may vary depending on, e.g., the learner's attitude towards technology.
- 2** However, the situation in which remote learning is the only possible way of teaching is a far cry from how courses were traditionally held — most of the time, online classes were only an addition.
- 3** Different life situations of students affected by the pandemic and the crisis it caused should provide an additional incentive to reduce the learning burden and consider the unique circumstances that determine the learning opportunities during this period.
- 4** So far, the research conducted during the pandemic has shown that students appreciate more synchronous classes, which allow them to interact directly with the teacher. This is an example of the importance of a trend called (*humanizing online teaching*).
- 5** Common problems for both learners and teachers are the increased workload, required to conduct classes or learn remotely, and technical problems.
- 6** The shift to distance learning is easier if there are pre-prepared materials for teachers and students, including materials on „how to learn online“, which are aimed at students and introduce methods that increase remote learning efficiency.
- 7** Technological solutions that use process automation in remote learning can help develop tools for preparing and verifying online tasks.
- 8** When planning and designing technical and organizational solutions for distance learning, it's important to consider the unique nature of different disciplines. There is no single set of tools and methods that would be appropriate for all the disciplines.

# Introduction

The pandemic has affected several areas of social life. Teaching and learning is one of them. In the summer term of the academic year 2019/2020, universities in Poland switched from full-time teaching to remote teaching in a matter of weeks. However, this change was by no means unique on a global scale. Among the 424 universities surveyed between March and April, **98% declared that COVID-19 had an impact on university life**, with 67% describing the change as a shift to distance learning and another 24% indicating plans to switch to this form of learning (International Association of universities 2020: 23).

The main purpose of this report is to present the issue of a remote teaching in universities during the global pandemic. **Although distance learning has become the dominant or the only form of learning that has been going on for several months, there is still little data and research available to provide an in-depth insight into the effects of online education.** Thorough analyses are time-consuming, and the dynamic nature of the occurring changes prompts one not to jump to conclusions. Therefore, the issues presented below are based on cautious investigations of available information and preliminary test results.

The report consists of three parts. The first part is a content outline of remote teaching in the era of pandemics. E-learning challenges have been linked to factors affecting e-learning effectiveness. The second part deals with students' situation, their experiences with the pandemic and remote teaching, and their preferences towards it. The third part discusses the issues from the teachers' perspective. The report ends with a conclusion of interdisciplinary observations of the digital transformation and the challenges it poses. The following issues related to the topic are based on the belief that remote learning, in the current situation, is not only a set of technological solutions but also organizational and procedural actions, where one must take into account the unique nature of the pandemic reality.

## Terminology and characteristics of the sources and methods used

Remote learning refers to education received through electronic tools, regardless of whether it takes the form of synchronous classes, that is, taking place in real-time or asynchronous, based on students' independent familiarization with previously prepared materials. The term e-learning is used interchangeably with the term remote learning in this report.

The report is based on *desk research*, and the references are included in the bibliography. It focuses on the latest reports, analyses, studies, and expert opinions. This is because the current situation is incomparable to previous attempts to implement e-learning; therefore, if possible, it is necessary to take into account its unique nature.

# 01

## **Remote learning: the challenges posed by the pandemic**

Although distance learning has been the subject of research for years, there is a lack of clear conclusions about its effectiveness compared to the traditional form of teaching (review of research: see EOM, Ashill 2018: 43). However, in the current situation, when it is not possible to teach in person, it is more important to show what factors influence remote teaching effectiveness. Focusing on this issue can help improve the quality of teaching during the global pandemic.

# Factors determining the effectiveness of remote learning

Research on e-learning has been focused on identifying variables that affect e-learning outcomes. The models developed by researchers to assess the effectiveness of remote learning reflect the multidimensionality of this issue. Among the factors indicated by the researchers (see Ozkan, Koseler 2009; Eom, Ashill 2018) the following should be distinguished:

- **Instructor's attitudes**, e.g., relationship with technology, level of engagement, accessibility, ease of communication;
- **The system's quality**, e.g., user-friendliness, relevance for remote learning, system stability, security (i.a. data security), interactivity, speed, ease of use. Besides, access to devices that enable efficient and convenient use of the system also plays a significant role;
- **The quality of information**, i.e., the quality of the materials used for e-learning, their readability, usefulness, the way they're organized. What more the issues such as informing in front about the availability of content or methods of crediting classes were also highlighted;
- **The quality of the service**, i.e., administrative aspects such as course authorization and management or issues regarding the budget for e-learning;
- **Learner's attitudes**, e.g., his motivation, how s/he perceives the value of a given course, how hers/his sense of involvement in remote teaching is formed;
- **Supporting factors**, such as legal or ethical issues and the cost of e-learning.

In studies on e-learning, the most commonly used methodology is the qualitative method, more precisely: case study (Valverde-Berrocoso et al. 2020: 17). Researches are often based on observations of relatively small groups of students and focus on selected factors affecting the effectiveness of distance learning, making it difficult to compare their results – especially in the light of rapidly changing technological conditions and evolving user preferences.

## Empirical research on the effectiveness of e-learning: the example of the UK

A study conducted on more than 560 students at Warwick University (Al-Fraihat et al. 2020: 80) has led scientists to the following conclusions:



tools that facilitate **communication, interaction, evaluation** of material, as well as **differentiation of teaching styles**, have a positive impact while using e-learning;

**the way of conducting classes** has a significant impact on how students perceive the usefulness of the e-learning system and what **satisfaction** they derive from remote learning;

the systems' characteristics used for remote learning, such as ease of use, **reliability, level of personalization, or integration of system elements**, affect how students perceive the usefulness of the tools used for e-learning.

## Comprehensive diagnosis of the digital dimension of Higher Education: Ireland's example

The digital dimension of higher education survey carried out in autumn 2019 in Ireland, with more than 24 000 students from 32 higher education institutions participating, stands out. First of all, the survey was carried out on a national scale to diagnose the level of educational digitalization comprehensively. Secondly, it was a recent study; therefore, it includes the responses of a generation of people brought up in the technological environment and accustomed to it, as well as to the digital devices.

The survey reveals that students see online practical tasks (41%), course-related videos (20%), and interactive in-room surveys/quizzes (18%) as the most useful (National Forum for the Enhancement of Teaching and Learning in Higher Education 2020: 83).

# Evolution of expectations of remote learning

An analysis of the literature on the effectiveness of e-learning led the researchers to identify as many as 92 different factors whose impact on remote learning effectiveness was studied (Choudhury, Pattnaik 2020: 8). Based on the findings presented in 138 articles published between 2000 to 2018, the researchers indicated that these factors are subject to change and depend on the generation of internet users who learn remotely. The authors organized the crucial factors identified in the research depending on the groups' importance in the remote learning process. **For modern users of the Internet, the so-called. generation 4.0, when it comes to online learners, the key is i.a. student's attention, IT innovations, and the user's perception of the digital environment in which s/he learns.** The results show that an appropriate way of motivating students and promoting their independence, which is the teacher's responsibility, plays a major role. When it comes to designing e-learning solutions, the tools' interactivity is of increasing importance.

An important conclusion from this analysis is the need to acknowledge e-learning in the context of changes occurring to the technologies. **Solutions designed a few or more years ago may lack the functionality that has been recognized as essential and necessary by a generation that was surrounded by digital technologies since infancy.** A good example is the availability of such solutions for mobile phones. How interactive the tools are and their integration is also crucial. To achieve this, appropriate technological solutions are needed, as well as communication and cooperation between groups of actors responsible for remote learning - including lecturers, administrators, and university authorities. It is when one takes into account the perspective of all involved in the process of remote learning (i.e. teachers, students, and those responsible for the technical side of the process) can bring the best results.

# Higher education in the pandemic era: a time of uncertainty

**The high level of uncertainty about what's going to happen and the need to act in rapidly changing circumstances make the current situation incomparable to what it was before the pandemic outbreak.** Remote teaching does not currently play a complementary role in classroom teaching. As a result of decisions taken due to the pandemic's development, e-learning has become, depending on the restrictions' duration, the primary or only form of education. Thus, the report focuses on presenting the specific processes of switching to distance learning.

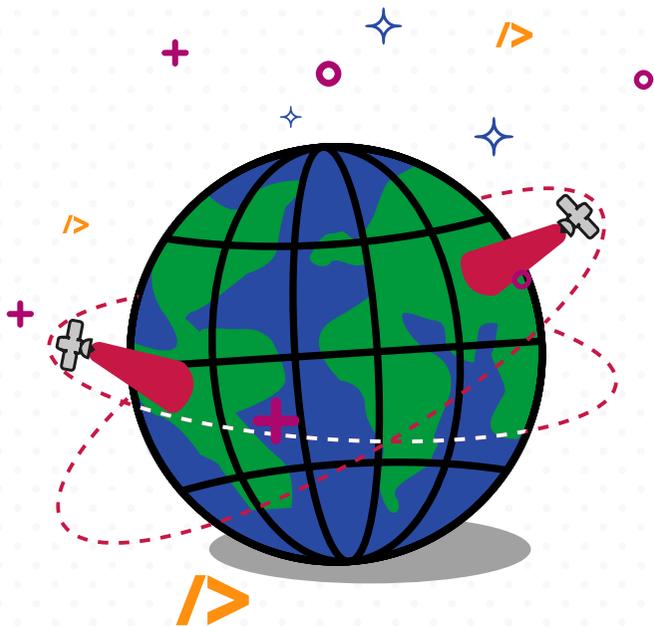
This necessity creates a number of new challenges in the field of teaching. Until recently, only part of the courses in the study program could be held remotely because of the regulations. But recent events and the decisions made, especially ones concerning the university's functioning, changed it. At the same time, the solutions are often created based on the existing approach to holding classes; for example, workshops are to be held synchronously, at certain hours, according to the earlier planned schedule. Remote teaching aims to be in line with traditional teaching methods, at least from an organizational perspective.

However, this is not always possible. **It should be emphasized that a university's characteristics, such as its autonomy and the differences in needs between various disciplines, make it difficult to talk about general trends in the transition of higher education to e-learning.** Certain decisions, i.a. decisions on recommended or mandatory tools, may be taken on the level of individual, organizational units. Flexibility in this regard is understandable: solutions that work well in lectures conducted for several dozen students (eg. in the form of videos shared on YouTube) might be inappropriate for workshops (eg. based on work in small groups through the so-called breakout rooms in zoom). Hence the need to adapt and develop solutions that meet specific needs.

However, diversity may be perceived differently by students and lecturers. For lecturers, getting acquainted with different programs is laborious and requires them to master new skills quickly. On the other hand, it may be inconvenient for students to switch between multiple platforms used by teachers. Solutions are needed to facilitate the reconciliation of different needs while considering institutional guidelines for the use of specific tools.

The pandemic itself affects the lives of particular groups and individuals in different ways. **Gender, financial standings, family or psychological situation of both male and female students, as well as of lecturers, may affect their ability to i.a. access the equipment needed to participate in the classes, have a good internet connection or space where they can calmly and comfortably participate in the lectures or conduct them.** The survey results of the Union of Polish banks on the pandemic's impact on students' financial situation (published in October 2020) show that 53% of respondents had their financial situation deteriorated in the last three months leading up to the survey. (ZBP 2020: 4). The economic crisis affects the young people the hardest, as they often work under civil-law contracts in sectors particularly struck by restrictions, as well as women, who bear more of the burden of the current situation.

Perceiving these factors' impact on opportunities to engage in distance learning highlights the unprecedented nature of current events. Higher education, like most areas of social life, faced a number of challenges. The influence of external circumstances on what kind of solutions universities need has become clearer than ever.



# Studying during a global pandemic

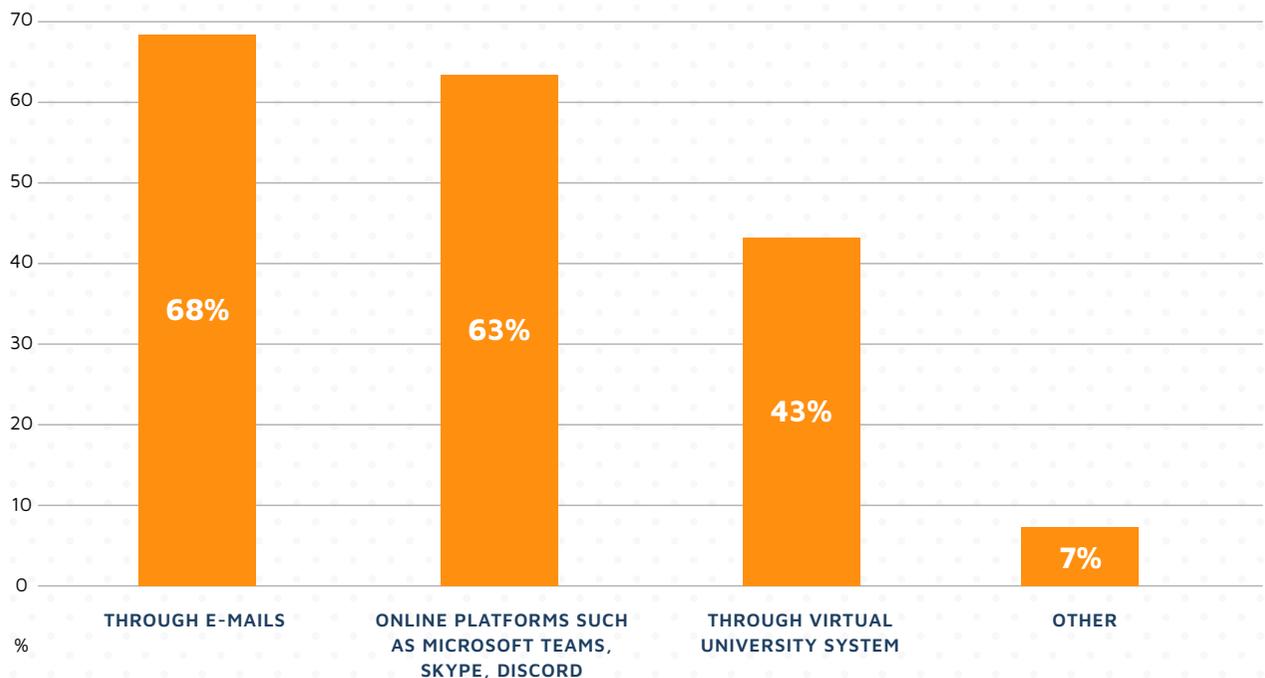
This part of the report presents data on the pandemic's impact on distance learning from a **student's perspective**. The topics cover mainly subjects describing students' preferences for online classes and the problems associated with the transition to distance learning - which they have faced before and still are.

# E-learning at Polish universities during the pandemic: difficult beginnings and a new normal

An Independent Students' Association (ISA 2020) has attempted to diagnose students' situations in the initial period of distance learning. More than 3,400 students from 100 different universities in Poland took part in a survey conducted between March and April. Among the respondents, as many as 53% indicated that they had encountered a situation in which the teacher did not conduct classes remotely in any way, while in the case of 24%, this situation was valid more than once. When asked how the remote lectures were held, 68% of respondents indicated the answer „by mail,” and 63% said they were carried out on „platforms such as MS Teams, Skype, or Discord” (here it was possible to choose more than one answers).

With the situation stabilizing and following new norms for higher education, new standards have been developed describing what tools and methods should be used for teaching certain types of classes. Now, the questions that arise are how to improve the solutions adopted and how to introduce facilitation that can enhance the functioning of remote learning during a pandemic and develop good practices when it comes to the used tools and methods in the future.

How the classes were held at the responders university



Source: Independent Students' Association 2020

# Student preferences regarding remote teaching during the pandemic

A survey conducted in April 2020 provides some guidance on students' preferences regarding distance learning. Researchers from the University of Zadar (Croatia) conducted a study involving more than 9000 students from Europe (BFUG 2020). Students' views on their preferred method of conducting classes were analyzed. In the case of lectures, 57.43% of respondents chose a synchronous form (BFUG 2020: 11). It was also the most common answer chosen for seminars, workshops, and consultations. Similar responses were given by students of the Faculty of „Artes Liberales“ at the University of Warsaw, most of whom (66.7%) thought that synchronous meetings were the best way to conduct classes remotely (Wiśnicka-Tomalak 2020: 78).

**A large number of students appreciate the direct contact with the lecturer and the constant hours of classes.** Such feedback from students may signal that one of the main advantages of remote teaching in a pandemic, the ability to process a given material at any time, is not necessarily perceived by students as a value.

An example of research carried out at the University of Bonn after the summer semester of the 2019/2020 academic year is a survey addressing the value of individual elements of remote learning for students. **Among activities highly valued by students were worksheets, video materials, pre-prepared reading materials, and videoconferences.** It is also crucial to evaluate the courses that take place during the pandemic. It's vital to ask students for their opinions and consider them when planning further distance learning activities because of the different role played by e-learning today from what it had before.

## E-learning before the pandemic vs. e-learning during the pandemic

These preliminary results of the BFUG analysis contrast strongly with how distance learning benefits have been perceived so far. While analyzing e-learning, the possibility of using materials for studying in any place and time was often pointed out as a value. For example, a study conducted on more than 270 students looked at i.a. what students perceive as the main advantages and disadvantages of distance learning (Caporarello et al. 2018: 168-169).

### The positive effect most often mentioned were:

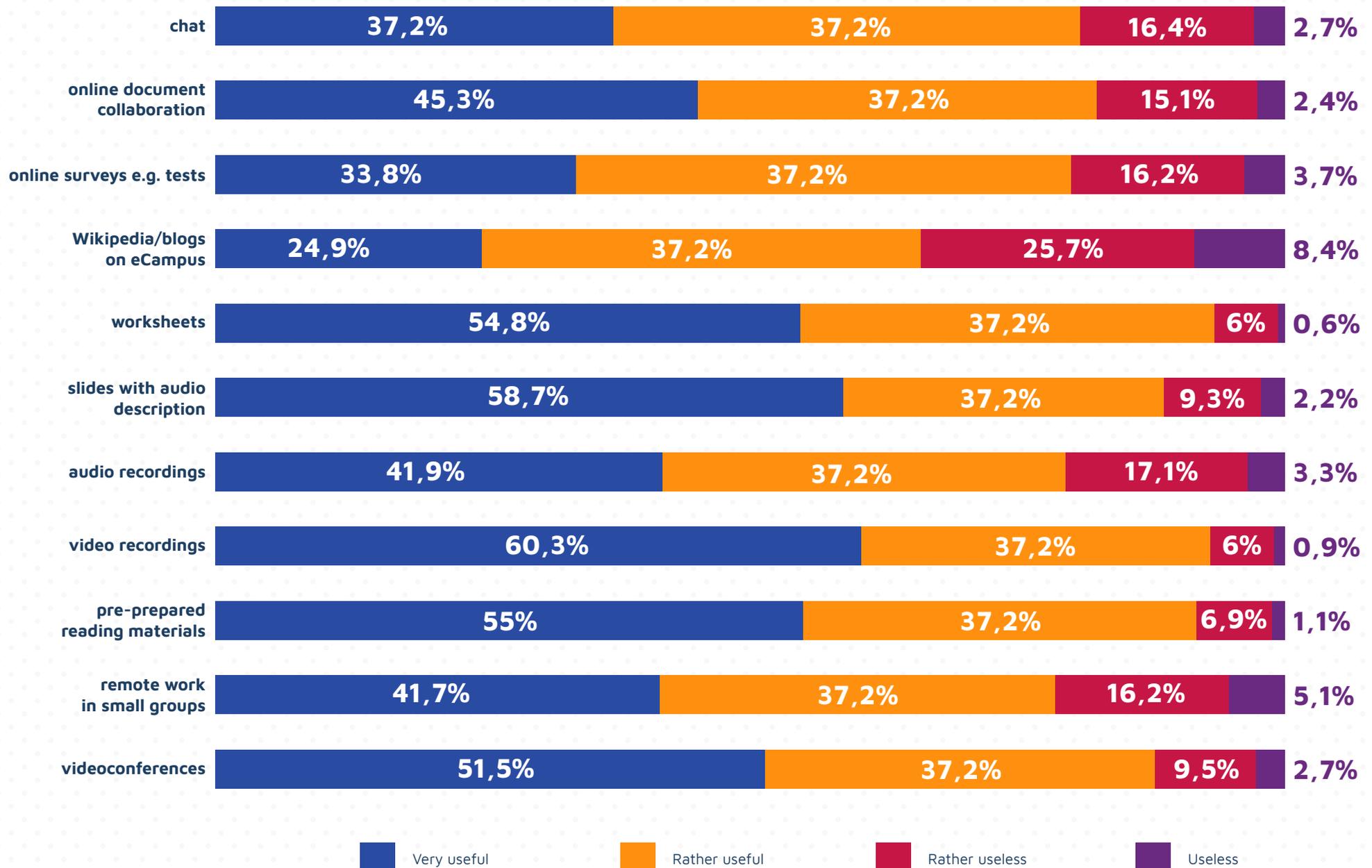
- increase in flexibility (time and place of studying);
- sharing materials;
- the ability to download materials for studying (eg. presentations);
- updating teaching materials;
- easier interactions with teachers.

### In turn, the main disadvantages of e-learning were:

- limited social interactions;
- increase in costs related to equipment;
- decrease in ability to understand how students learn;
- technical problems;
- increased learning opportunities for students with relevant technological competencies.

In the light of the need to shift to distance learning and based on the preliminary results of the *Bologna Follow-Up Group* survey presented above, students' answer concerning the disadvantages of distance learning most often indicated by them is quite significant. When connections are limited, students are more affected by the lack of courses that allow interactions with other students and teachers, albeit indirectly by the network.

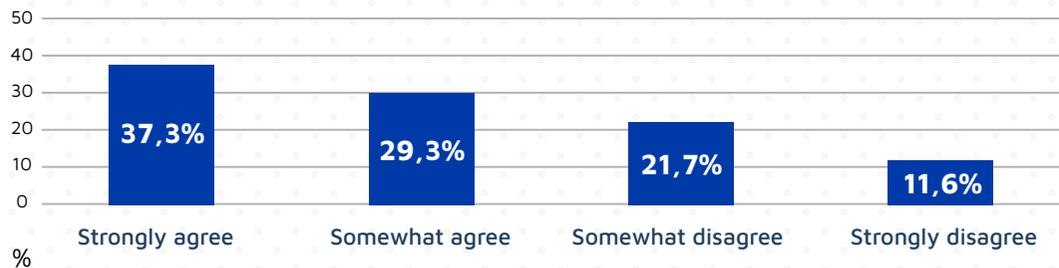
# Usefulness of particular elements of online learning



# The labor intensity of e-learning

The problem that is becoming clear with the sudden and complete shift to distance learning is students' increased workload. The results of a study published by the *Bologna Follow-Up Group* indicate that **more than 50% of those surveyed consider that their workload related to studies is greater than when the classes were held on campuses** (BFUG 2020: 12). A survey of more than 5000 students at the University of Bonn found that more than 66% agreed that their workload had increased.

Increase of workload during online learning



Source: Universität Bonn 2020

According to research conducted among Warsaw University students', the pressure associated with the workload and the need for timely completion of tasks is felt especially strongly by people with dyslexia. More often than students who read and write without impairments, they agree that remote teaching requires of them more reading and writing than normal classes. They feel more time pressure to perform online tasks than when classes were held offline (Zavadka et al. 2020: 11-12). Meanwhile, experts point out the need to adapt the number of materials studied during classes to the exceptional reality of the pandemic.

The aspect of labor intensity in distance learning, observed in both initial results of the research conducted among students and how scholars perceive it, should be regarded in a wider context of the social changes brought about by the pandemic.



*Simplify; cut back expectations; help reduce anxiety. Students will simultaneously be having to adapt to new ways of teaching and learning and deal with all the logistical complications and emotional stress of the pandemic and its associated lock down. (...) Lighten the load, ditch nonessential parts of the syllabus. You can always build things back up later, if you have over-simplified.*

(Rapanta et al. 2020: 929. Self-translated)

# The impact of the pandemic on other aspects of student's lives

Although the psychological effects of the pandemic are already being studied (see Faculty of Psychology, University of Warsaw 2020a), it is their long-term impact on mental health that we will apprehend only in the future. At the same time, the conclusions of the analyses carried out so far are already worrying. Preliminary results of a study conducted on a group of almost 1,400 adult Polish people indicate that „38% of the respondents report severe depressive symptoms“, whereas „as many as 62% of the participants claim to have severe general anxiety symptoms consisting of a constant feeling of anxiety or excessive worry, which significantly affect many areas of their everyday life“ (Faculty of Psychology, University of Warsaw, 2020b).

It should be emphasized that preliminary diagnoses allow us to note that the pandemic has a substantial impact on functioning and well-being, especially in young people. Studies carried out in the spring of 2020 by prof. Zbigniew Izdebski (University of Warsaw 2020) showed that among students, as many as 53% of them said that they had experienced periods of depression or mental crisis during the pandemic. **As many as 44% of people surveyed in the 18 - 29 age group indicated that they experienced stronger periods of depression and depressive episodes, whereas 41% said they felt loneliness more forcefully.**

Studies carried out in May of 2020 (coordinated by dr hab. Margaret Gambin) have shown too that **„persons in the 18 - 24 age group show the highest (significantly higher than other age groups) level of symptoms of depression and general anxiety during the epidemic“** (Gambin et al. 2020: 1). These results show that universities may have a much more important role to play than strictly didactic towards students. Students, greatly affected by the effects of the pandemic and the economic crisis associated with it, on the one hand, might expect from their universities to create the closest thing to normal, on the other hand, to show understanding for the disturbed rhythm of everyday life and several difficulties associated with the pandemic and restrictions.

# The role of institutional conditions in creating student-friendly e-learning environments

**Planning** and **informing** about decisions regarding life organization at the university is an important factor for creating student-friendly conditions for remote education. However, given the unpredictable dynamics of decision-making processes at the national level and the uncertainty of the pandemic situation, planning is challenging. It is all the more worth highlighting how much universities have achieved in a few months. From the state where as many as 53% of students indicated that they had encountered a situation in which the teacher did not conduct classes remotely in any way, they progressed to a stage where the organizational framework was created, allowing the university to continue its life through the web. Among the important elements of this process, the following aspects should be noticed, such as:

- **decision-making processes** regarding which tools to use and in what form classes should take place - including determining at what level decisions are taken (e.g., does the teacher have a free choice of tools, does he have to choose tools from a specific pool provided by the organizational unit, or are these decisions made at the highest university level);
- **providing training and workshops** for academic teachers - both on using the tools and the methods used during remote teaching. Besides, it is also vital to set up groups or hotlines providing technical support, advice, and access to materials that facilitate the use of digital tools as soon as possible;
- **preparing recommendations** assembling key guidelines for the instructors.

However, an occurring problem is a need to keep the balance between standardized requirements, e.g., the tools used for teaching and the freedom that allows teachers to adapt their classes to the group's needs and students' preferences or technical capabilities. As mentioned above, remote learning during the pandemic plays a different role than e-learning, which was usually treated as an addition to full-time studies. Therefore, it is essential to establish how students feel about classes conducted in such ways, whether they are satisfied with them and feel that they are useful.

## Learning how to teach: best practices

Among the steps taken to make an effective transition to distance learning, it is worth noting those toward students. The National University of Ireland Galway (NUI Galway 2020) has prepared an online course consisting of very accessible and short-form batches of material to prepare students for remote learning

*(<https://www.allboardhe.ie/Aspire/Learner/content/index.html>).*

he course provides useful advice on, e.g., the effectiveness of making handwritten notes apart from the use of digital material or the importance of a comfortable workstation and instructing how to use the software.

## Innovative methods of recognizing student's needs

An interesting attempt to identify student's needs connected with the transition to distance learning was a study of American students' tweets (Veletsianos, Kimmons 2020). An analysis of thousands of Twitter posts on the topic of how the classes held came to the following conclusions:

- students appreciate calm and optimistic leaders;
- students value down to earth teachers, ones who consider learning important, but in the light of life and health risks and economic problems (these factors affect students, lives and opportunities), take such issues into account;
- students value leaders who are empathetic, flexible, and have reasonable expectations;
- maintaining professional behavior in academic relations has a positive impact on both students and teachers;
- students expect teachers to use the technologies with ease;
- however, not all students are comfortable with new technologies, and sometimes they need support in operating them.

The trends thus identified among the students show that both the policy of the institution towards, e.g., supporting **the development of digital competences of teachers and students**, as well as **the approach of teachers** based on **empathy and understanding**, are important. The particular technological aspects are not as important as **building relationships** between students and scholars. Therefore, the role of soft skills while communicating by electronic means should not be diminished.

# Teaching during a global pandemic

Despite similar experiences (associated with remote learning or teaching, e.g., decrease in labor intensity) of both students and teachers, scholars' challenges are of a different nature. This part of the report presents teachers' perspectives regarding distance learning: the challenges associated with it, and the best practices that can help overcome arising problems.

# Technical aspects of remote learning

Technical aspects are a fundamental problem in remote learning. Due to the increased use of the web and the need to have a stable connection to conduct classes live, many teachers (and students) faced problems accessing internet bandwidth, enabling them to hold an uninterrupted class.

The question about internet connection issues was included in studies conducted among students of medical universities and lecturers of the Warsaw Medical University (WUM). **According to the results, 39% of the instructors experienced problems with the internet while conducting classes. Among students, almost a third felt excluded because of limitations to internet access or connection capacity.** These answers show how much the lack of access to a stable network or equipment can determine opportunities for remote education.

## Data protection and cybersecurity

From a technical perspective, it is also critical to apply standards regarding personal data protection and **cybersecurity** and propagate knowledge about them among students and scholars. Developing existing solutions and providing information about them shows how important the decisions taken at the university level are. The central administration level is where the decisions about guaranteeing cybersecurity and actions to propagate knowledge about them should be made.

# Institutional aspects of distance learning and related challenges

Technologies and methods used for remote education are, at the moment, often defined at the level of organizational units of universities or even at the central administration level. Such a solution might respond to the needs of part of the teachers conducting classes. The survey on remote learning, based on interviews i.a. with scholars, indicates that:

*„In the course of the discussions with the teachers, the impression was that they preferred top-down instructions regarding which tools to use for remote education. Scholars at the faculties where the decision on what tool to use was made at the highest level declared that this decision made it easier for them to adapt and function in the new reality.“*

**(Klimowicz 2020: 14)**

Clear communication about the preferred tools used for remote education, training on how to use them, and instructions on using specific functionalities are essential to make teachers feel at ease in the e-learning environment.

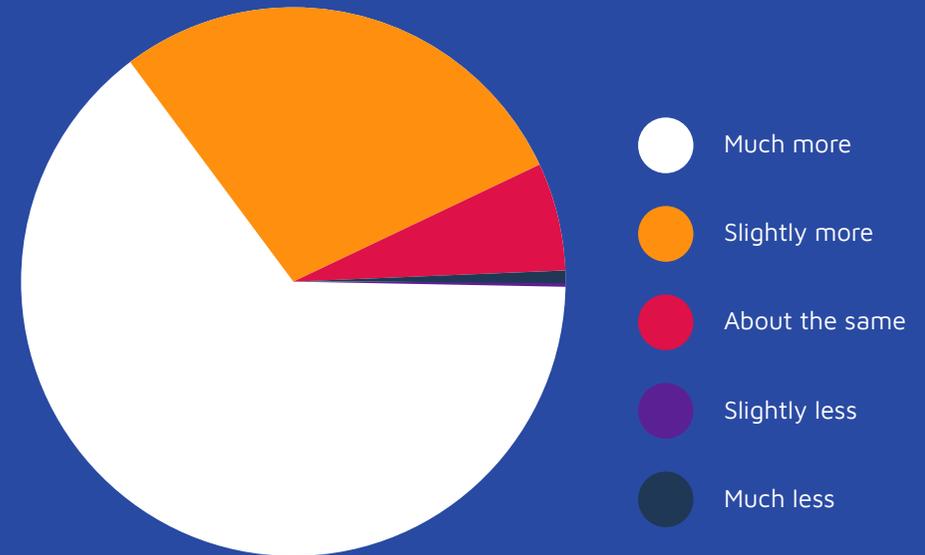
## Training of academic teachers

An example is the courses carried out by the Development of Competencies of Academic Teachers Department at the Human Resources Office for academic teachers at the University of Warsaw. A total of 1100 places were offered for those wishing to take part in online training on IT tools, didactic, and soft skills. More than 500 academic teachers took advantage of this opportunity, each taking part on average in two training sessions.

The challenge that arises is finding **a balance between establishing the rules for everyone and applying one's solutions, and creating general guidelines and the flexibility in the face of changing circumstances and needs.** Examples of the challenges that arise:

- **the gap between the recommendations like the need to reduce the workload of students and the need to complete the program** (increased workload and time-consuming of distance learning vs. the need to implement the same scope of material as for traditional classes);
- **a decrease in labor intensity and increase in preparation time for online classes**, while no change **in the teaching load**;
- **balancing between an attempt to recreate a traditional way of class** (e.g., holding synchronous classes at scheduled times) and **inadequacy of existing solutions** (e.g., inefficient ways of assessment or increased difficulty in maintaining students' attention during remote lectures).

## Preparation time for remote classes in relation to the traditional model



Source: Czaja et al. 2020

## Training of academic teachers

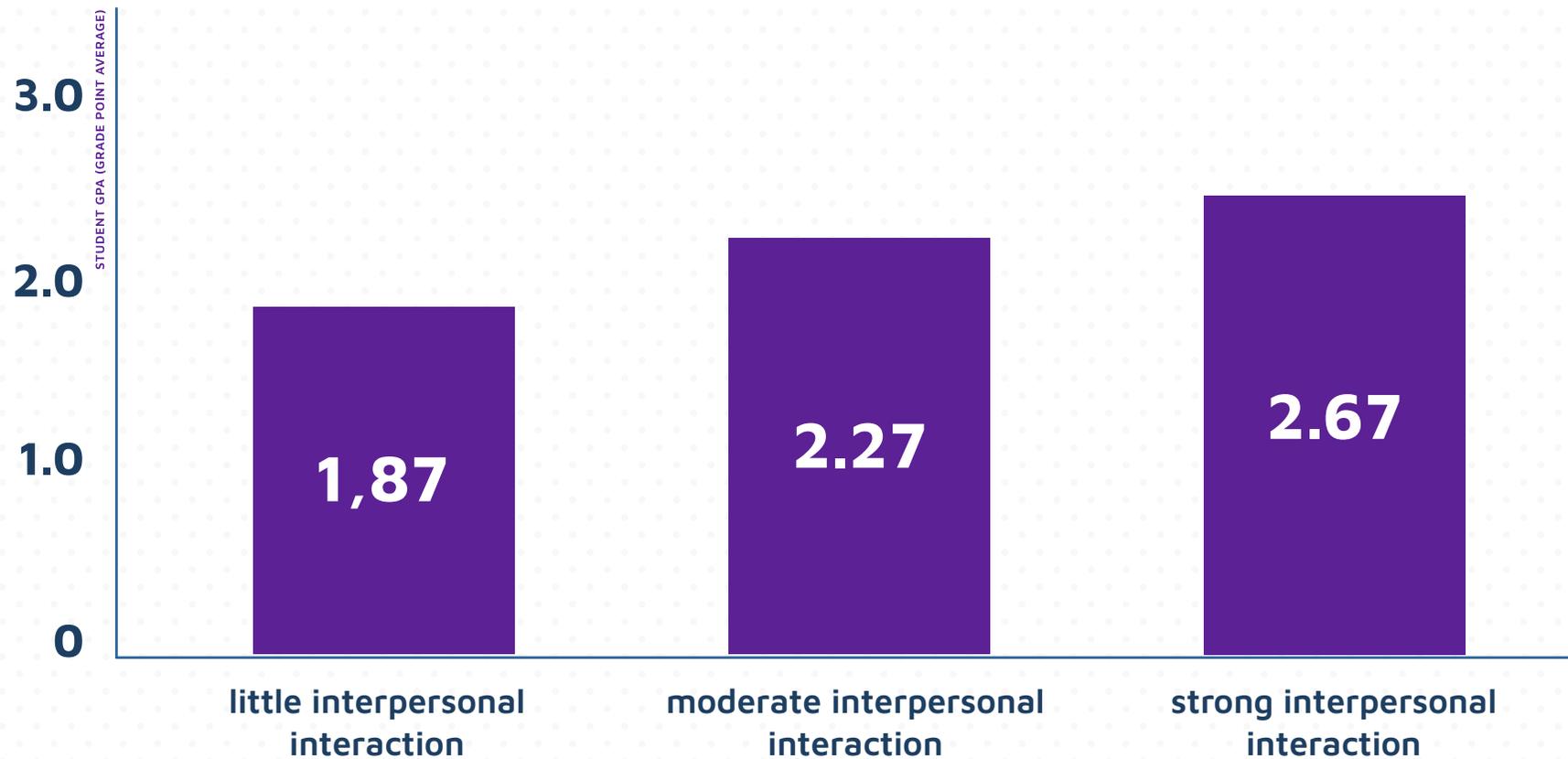
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# Basic principles of effective remote learning during the pandemic

In the light of challenges and students' preferences for distance learning outlined above, it should be concluded that:

- during the pandemic, **synchronized** meetings are usually the preferred form of activity. Simultaneously, due to the quicker distraction and the fact that sitting in front of the monitor is more tiring, it is recommended to shorten classes or take breaks more frequently. In addition, „online learning has so much of time and flexibility that students never find time to do it.“ (Dhawan 2020: 8.) - therefore, synchronous classes usually facilitate the organization of work for students and allow them to fulfill the requirements regularly.
- At the same time, due to i.a. technical problems and a sense of digital exclusion, **there is a need to prepare materials that allow learning and revision of the material also** after the classes. Difficulties in accessing materials because of the limited access to libraries, restrictions on movement, or students' living conditions should also be considered when preparing for classes.
- For both synchronous and asynchronous classes, it is crucial to prioritize **the essential sections of material** and try to concentrate on them as much as possible.
- Establishing a **connection** with students, facilitating **communication**, and, at the same time, establishing how **frequent** it is (whether the classes are synchronous or asynchronous) plays a vital role. Research has shown that a higher level of interpersonal interaction during distance learning is associated with students' better results.

# Relationship between level of interpersonal interaction and student performance



Source: Community College Research Centre 2013

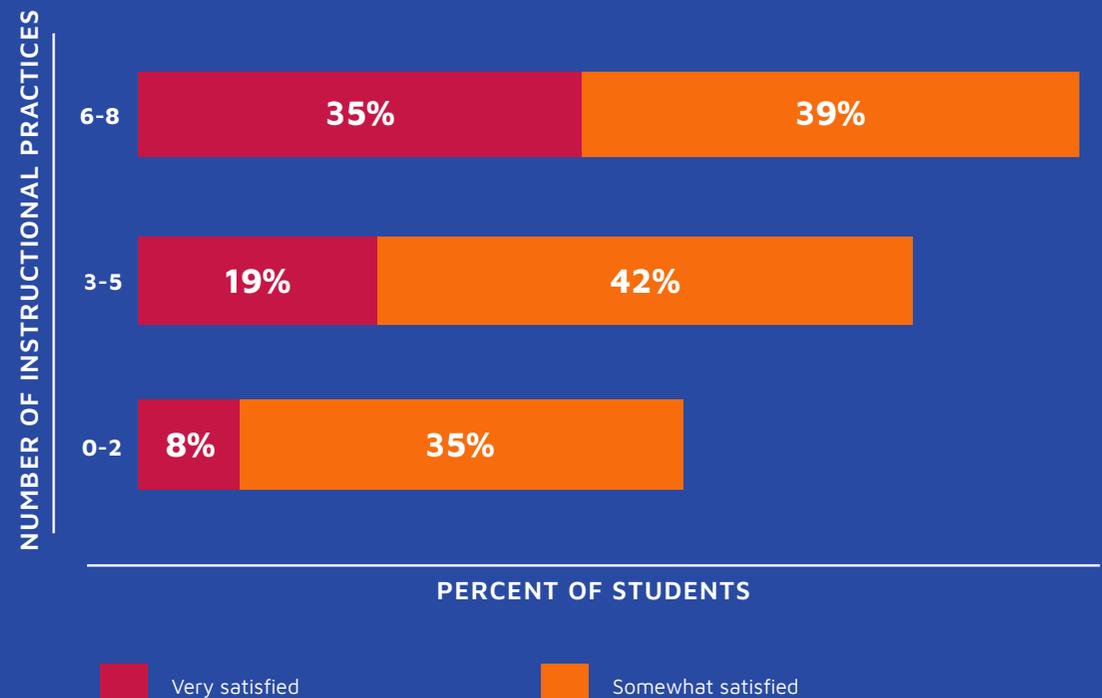
# Recommended practices for establishing student satisfaction during remote learning

The interaction between the teacher and students was taken into account in studies conducted in connection with the transition to remote teaching in the United States. The survey, which involved more than 1000 students, examined the relationship between the number of recommended distance learning methods and student's satisfaction with classes. It focused on which practices increase the level of student satisfaction with class participation. Listed below are these used during online classes, which increased the level of students' satisfaction:

- assignments for students in which they describe what they have learned and what they need to learn;
- dividing the activities into shorter segments than in traditional classes;
- quizzes and other tasks to assess progress;
- synchronous sessions when students can ask questions and participate in discussions;
- dividing students into smaller subgroups during online classes;
- direct messages to individual students asking how they are coping with a given class or messages aiming to ensure that students have access to materials;
- using life examples to illustrate course content;
- working in groups outside of classes (Means, Neisler 2020: 15)

The results show that the more recommended methods were used, the higher the level of student satisfaction.

**Satisfaction with online activities during the pandemic according to the number of recommended practices used**



Source: Means, Neisler 2020

# Innovative methods in remote teaching

The catalog of practices listed above shows that the technologies used in remote teaching are mainly instrumental and intended to achieve the course's objectives. The digital tools should help follow the guidelines developed by experts, i.e., divide classes into smaller groups, show students the progress they have made in a given time, or create tasks that will positively impact their motivation.

Solutions that help to conduct remote classes:

- meeting the needs of students regarding class **organization – deciding on the channel of communication and its frequency** and issues related to the **availability of materials**. It is worth considering the unique nature of the subject, its place in the entire curriculum, and the fact that remote learning requires more time while simultaneously causing quicker distractions.
- Using existing resources (e.g., excerpts from movies or podcasts) to liven up classes. One of the recommended best practices in remote teaching is to modify the methods, i.e., in addition to, for instance, lecturing; one should also use other ways of passing knowledge.
- **Motivating** students by creating quizzes and other types of tasks helps continuously show their progress, while simultaneously uses automated verification of answers. It is also worth using solutions utilizing **gamification mechanisms** because research shows the positive impact of elements derived from games when introduced into the learning processes, greatly impacting the students' results. (Subhash, Cudney 2018).
- The class structure should be based on **smaller thematic blocks**, which allow allocating a certain fragment of the material. It would be best to concentrate on the essential materials from the expected learning outcomes perspective for the above reasons. At the same time, it is worth considering the findings on the effectiveness of repeating a given material, for example, the need to repeat more complicated parts and newly introduced points more often and older and easier ones less often (the so-called spaced repetition, see Gajderowicz 2020). Automated tools that allow one to create online task batches can help create this type of content;
- Use **video recordings** in the case of asynchronous teaching. Preferably with the teacher's face in the recording, shorter than traditional lectures, and (which may not be intuitive) performed faster (SmithTech 2020: 18).

These examples show that new technologies should be applied following the demand arising from the teaching methods. The teaching methods should be more flexible because of the unique nature of the current situation.

### Tools for quizzes, surveys, and other means to liven up remote learning

In addition to tools such as Microsoft Teams, Google Services, University platforms, and Zoom (used to teach classes), several solutions can help diversify remote learning. A good example is services that allow one to create interactive quizzes (e.g., Mentimeter or Kahoot!) and interactive boards (Padlet, Miro, or Mural).

An extensive list of digital tools designed for remote education can be found at <https://techagainstcoronavirus.com/edu>.

### Change in teaching and assessment

With e-learning as a primary form of teaching, it is necessary to re-think the form of crediting certain subjects. According to the recommendations collected in the *Coimbra Group Universities* report (2020: 22), among the recommendations formulated by universities appear:

- avoiding supervised written exams;
- replacing the above-mentioned form of exams with tasks, open-book exams, creating projects or portfolios;
- introducing oral examinations;
- providing support (by universities) in changing the forms of assessment (guides, webinars, preparation of open-book exams, and design of exam questions).

# Building an online academic community

New technologies will serve several roles in building an academic community, including beyond the scholastic dimension. Scholars face challenges such as the need to build relationships with students only through electronic devices, the inability to maintain spontaneous connections with colleagues and students, or the ability to participate in scientific exchanges only remotely.

Creating a space for learning and discussion is key in building a sense of academic community, both between teachers and students and between students themselves. The needs of both groups should take into account, which is by no means easy to do. Teachers are expected to have an individual approach to students, especially as far as distance learning is concerned, which might be difficult when teaching large groups. A pivotal role is played by continuing contact and quick response to students' messages. In turn, the shift of the entire students' life to the digital world means for students, i.e. many hours a day in front of monitors. The increased time-consuming nature of distance learning may discourage participation in other college activities. Despite these difficulties, many student organizations carry on their activities, creating, despite the current restrictions, a space for joint activities. Organizing online meetings, preparing videos, or simply forming groups facilitating the exchange of information and opinions.

**Both the time during classes and the time between them create opportunities to strengthen the relationship between students.** Activities such as:

- teamwork;
- sharing content on a virtual whiteboard;
- establish a communication code (e.g., gestures), which would allow one to quickly respond to what is happening and thus participate in the discussion,

these are examples of how to enhance interaction during the course (see Harvard Graduate School of Education 2020). The common goal of using such methods is to progress towards distance learning development, which Mary Raygoza, Raina León, and Aaminah Norris (2020) define as „humanizing online teaching.”

# Summary: The future of remote learning

The condition of higher education during the pandemic has highlighted the tardiness and gaps in the digitization of universities. They have also shown deficiencies in soft skill competencies and relationship skills. Simultaneously, the swift adaptation to circumstances and the continuation of teaching in the winter semester in an almost exclusively remote model shows it is possible to quickly and effectively make changes in the organization of university life. However, one should consider how this radical change in teaching can be used to reflect on the role of higher education in the digital era and the tools and processes seen in the evolution of e-learning trends such as:

### Global e-learning

A number of platforms (e.g., Coursera or EDX.org) offer many teaching materials. Their attractive form and friendly way of presentation pose a significant competition for online courses prepared by smaller research centers. Opportunities to obtain diplomas from foreign universities without leaving one's home will increase, which is a factor that should be taken into account when developing a strategy to develop remote education. **That is why it is essential to know students' opinions regarding remote learning and verify which methods and ways of conducting classes are satisfactory.** Developing new solutions must consider learners' opinions, for example, their perception of the digital world.

### Data-driven and personalized learning

Trends that will impact remote education in the near future are data-driven solutions, such as organizing course content or adapting the level and type of tasks based on a user's results. Start-ups engaged in developing remote education tools are working, based on algorithms and data on how people learning, on solutions that will generate individual learning paths. Personalization of learning also affects areas like recognizing certifications (platforms offer remote courses) or implementing systems that allow students to track their progress, for example, on the individual parts of the material they should master.

The trends in developing tools and processes related to the digitization of teaching can cause mixed feelings. On the one hand, there may be concerns about the over-individualization of education and the personalization of how knowledge is acquired. On the other hand, according to the research results outlined above, during limited interpersonal contacts, it is the collective activities, the possibility of meeting in a group, even online, that are the elements of distance learning appreciated by students. While the role of new technologies in teaching will undoubtedly increase, it does not seem to be entirely doomed to automation.

### Potential in automatization of repetitive activities

Building tools that make scholars life easier and allow them to devote more time to tasks where humans are indispensable is an area where automation can play a key role. Applications that improve the preparation and verification of assignments generate automated prompts in case of difficulties or even create attractive teaching materials based on the content introduced by the host; the so-called teacher toolboxes are being developed. They are examples of **solutions where digital tools can lead to effective cooperation between automated processes and humans.** At the same time, such solutions can support learners' needs like monitoring their progress and creating space for personalized communication by saving learners' time.

### Humanizing online teaching

However, it is necessary to emphasize the important role of teachers and their interaction during remote learning. Studies conducted among pupils confirm the hypotheses about the importance of „humanizing“ remote education. Nevertheless, it is crucial to use digital tools to stimulate student's online work environment, facilitating interaction. Engaging classes in synchronous mode, which allow direct contact between students and the teacher or just between students, are perceived by pupils as more motivating. The need for interaction and contact during the pandemic is powerful. It is also a hint of what is most important in teaching, whether it takes place in the classroom or through the screen.

# The future of remote learning

However unique the pandemic period is and the changes it has brought about in higher education, one can see both the challenges and opportunities associated with remote education. In the extreme situation of the total or almost total shift of university life to the online world, we should see an opportunity to re-think and revise both our attitude to traditional teaching and e-learning. The table below shows both strengths and weaknesses of remote learning and the challenges and opportunities associated with it, which have become particularly evident in the pandemic context.

## Strengths

- more flexibility when it comes to participating in classes and better access to education, regardless of where one is;
- gaining experience that allows not only to continue teaching in the pandemic era but also to re-think the approach to remote education tools in the long term;
- accelerating the digitization of universities.

## Weaknesses

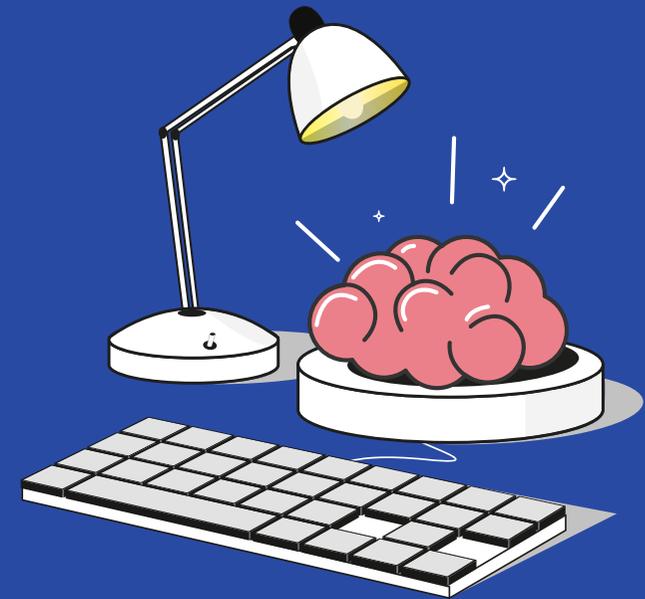
- requiring more work and more time consuming (both teaching and learning) while at the same time maintaining the existing requirements;
- significant role of technical aspects in didactics;
- difficulties in adapting some classes to the remote teaching, e.g., the discipline's specificity or the group's size.

## Opportunities

- the possibility of making the study process more flexible;
- a chance to create better learning conditions for students with disabilities;
- motivation to develop and implement technological solutions that improve distance learning;
- dissemination of digital competences among both students and teachers and providing the basis for their further development.

## Challenges

- preventing exclusion due to the necessity to have the appropriate equipment and learning conditions;
- keeping students motivated;
- adjusting of regulatory and institutional requirements to the challenges of distance learning;
- unknown long-term psychological and didactic effects of 100% remote learning - the need to monitor it closely.



On the one hand, it shows the enormous role that human contact plays in teaching – even if screens mediate it. It is an important indication of user preferences that should be considered when designing long-term plans for the development of e-learning projects. On the other hand, one sees that the whole higher education environment is subject to change.

The possibility of attending courses created by researchers from all over the world, or even undertaking entire learning programs online, poses a challenge to the traditional way of organizing universities. Universities, which will use technologies based on the automation of routine activities while personalizing learning, may be more attractive.

Implementing technological solutions might allow them to guarantee an individualized approach to student, i.a. they will provide more time for communication between teachers and pupils. Ironically, it is the wise use of the latest technologies that allows more human remote learning.

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