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Students' Perceptions on Online Teaching and Learning in Higher Education

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Abstract: *Virtual environments allow teachers to approach the teaching process inclusively and creatively, to facilitate the effective transfer of learning and to support student learning with new technologies regardless of various barriers. The hereby study evaluates the students' views concerning the virtual delivery of courses during their learning process taking into consideration their former face-to-face teaching-learning experience. It was based on the theoretical part which included typical aspects of online teaching and learning are presented and the most recent studies in this area are reviewed. Following previous research, we aim to develop an innovative model of successful online teaching and learning in higher education. A questionnaire-based research methodology was designed for 355 students at a university in the North-Eastern region of Romania. The questionnaire with closed-ended items was used for assessing students' attitudes on the online teaching activity. The results indicate students' preference for online courses, as well as a number of significant differences, depending on the study specialisation or form of education. Any future changes to online teaching and learning in universities should also take into account students' and teachers' views on this particular issue. Such an approach should allow us to see whether and how effective the use of virtual teaching environments can be for both students and teachers in higher education (HE).*

Keywords: *higher education; online teaching; online learning; perceptions; students.*

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Introduction

The manner in which distance learning has evolved over the past 225 years is fascinating, starting from the early 19th century when the first distance-learning courses delivered by regular post were initiated by the University of Chicago, through the mid-1980s when the first online courses were piloted at a few American universities (Sadiku et al, 2018), and to the present day, in the post-pandemic period, when learning can no longer be conceived of (at least in an academic environment) separately from the internet and learning platforms, becoming a natural part of any university programme. The fascination of its evolution comes not only from the way in which digital/virtual technology has gradually succeeded in taking over and replacing the traditional pedagogic context, but also, more importantly, from the transformations which this major change has brought about, and continues to bring about, in the teaching activity to the extent where the process is completely digitalised. Furthermore, this change has been heightened and accelerated as universities have become aware of and exploited the huge potential of the Internet as a learning tool (Ayu, 2020), along with all the elements of impact which ensue/will ensue accordingly, in their diversity and ambivalence (Cojocariu et al., 2016; Cojocariu et al., 2014). Given this framework, the expansion of technology (Nawar Al-Saadi, 2017), the general progress of economic-social life, but especially the coronavirus pandemic have led to a consequential turning point for an increasing teaching-learning shift towards the virtual education. Prior to 2020, the online dimension of teaching-learning in university education was by no means new (Krull & De Klerk, 2021), but it has been a topic of growing interest over the past years (Hofer et al., 2021; Hargis, 2020). It nevertheless represented an additional topic among others, occasionally contradictory, notably within the academic environment. These issues are supported by the data presented and analysed by Thomas & Dello Stritto (2021) showing in a poll by Gallop and Inside Higher Ed (2019) (Jaschik & Lederman, 2019) that 54% of the surveyed faculty members had never given an online lecture before the pandemic. Its findings also show that over 50% of all faculty members with online teaching experience admit that they rely on their colleagues' support in teaching online, in spite of their respective limited, incomplete, or partially accurate expertise. The results are also supported by more recent studies which indicate that if prior to the pandemic one third of universities delivered teaching entirely online, but following the pandemic the rate has boomed (Marcus, 2022), and as such the need for training, organisation and assessment has also increased.

A constant development of the HE students' technological skills is crucial for the social and professional integration as well as for the quality of personal life (Rodrigues et al., 2021). Embedding digital technologies is highly relevant for changing the academic teaching and learning at the level of interaction between learners, teachers and institutions. Educators can influence the online learning positively, but they can also have negative effects which they must be aware of in order to address them appropriately at the educational process level (Vesić et al., 2023). The transition from offline to online learning and vice versa can be difficult for students because they are required to adjust to the ever-changing learning process (Maya et al., 2022).

As contemporary society presents itself and evolves technologically, we are entitled to agree with the claim stating that "the 21st-century learner requires an education that can be pursued anytime and anywhere and that is more aligned with the demands of a digital society". Accepting the current intrinsic connection between education and the digital society, we will also better understand some of its important direct long-term implications, namely "online education not only assists students to successfully integrate a workforce that is increasingly digital, but it helps them to become more comfortable with the use of technology in general and, hence, more prepared to be prolific digital citizens" (Isaias et al, 2020, p. V). This perspective continues and reinforces the paradigm of the 2000s which highlighted the impact of e-learning towards lifelong learning and tertiary education "according to OECD (2005), e-learning refers to the use of information and communications technology (ICT) to enhance and/or support learning in tertiary education" (Ayu, 2020, p. 48). It also proves to be a form of organising the teaching process that makes great contributions to reducing inequality in schools, "has the ability to disassemble barriers that have been constructed by poverty, location, disability, as well as other factors" (Britany, 2015, p. 28) and to exploit "differences generated by criteria such as race, gender, class, ethnicity, sexual orientation, learning ability, experiences, and socioeconomic status" (Nawar Al-Saadi, 2017, p. 179).

Accordingly, online teaching-learning should no longer be understood as just a short-term crisis educational solution but as a natural way for running a long-term (Boghian et al., 2023; Kim & Bonk, 2006) and a very long-term academic learning process. Definitely, it is not by avoiding face-to-face learning altogether, but by a blended, hybrid version (Boghian et al., 2023; Nikolenko et al., 2023; Thomas & Dello Stritto, 2021; Nawar Al-Saadi, 2017; Kim & Bonk, 2006) yet adopting the lessons already learnt

during COVID-19 (Hargis, 2020; Hofer et al., 2021) and keeping a balanced rational approach to their benefits and challenges.

Finally, and fundamentally, teaching online is all about students, namely their learning style, their achievements (Nawar Al-Saadi, 2017), their skills, their states, their motivation (Florescu et al., 2023; Lamanauskas et al., 2021) and more. That is precisely why studies which address students' perceptions of different aspects of online learning in the university environment are extremely useful and important both for them (through the effort of awareness and self-analysis) and for teachers, decision-makers, economic representatives, employers, community. They can indicate, among other things, how, where and how much students prefer to learn online (providing suggestions to academic management), what is the self-perceived level of technological skills (individual support and means of online learning), which of the positive effects of online learning are most often experienced/recognised by students or which are the challenges of online teaching-learning identified by them, etc.

Online teaching and learning in higher education

Concepts of online teaching and learning

The terms related to the online educational process have been subject to many approaches, interpretations, definitions, variations (Nawar Al-Saadi, 2017), especially in the last three decades and the literature has tried to cover them as correctly, comprehensively and adequately as possible. The approaches and analyses of the process can be divided into two main directions: "e-learning as a philosophy of social learning, focused on student's needs, formed at the junction of psycho-logical and pedagogical dimensions and the networks and the e-learning as a specific way to learn" (Cojocariu et al., 2014, p. 2000).

According to Amiti (2020), online learning is considered an activity in a virtual context, where teachers and students make the most of different strategies in order to offer some learning content in which the latter are deeply involved in understanding and processing as much information as possible. Online learning has the following characteristics (Laksana, 2020), as follows: it builds knowledge and solving problems together in collaboration with other learners; it focuses on shaping an inclusive community; it uses different communication media with internet access, computer-based learning, virtual lectures and digital classrooms; it involves interactive, independent, accessible learning.

At a glance, *teaching-learning online* and *online learning* are relatively similar/co-substantial with *distance education* (Nawar Al-Saadi, 2017), *remote learning* (Hofer et al, 2021), *web-based learning, Internet-based learning process, computer-mediated learning, computer-based learning* (Nawar Al-Saadi, 2017); *m-learning* (Rangel-de Lazaro et al., 2023; Mâţă et al., 2021; Cojocariu et al., 2014), *online education, e-learning* (Ayu, 2020), *digital education* (Sadiku et al., 2018). Therefore, online teaching is a learning process that is partially or totally conducted (Boghian et al., 2023) based on/with the help of electronic/internet-based tools/applications (software, platforms) (Brittany, 2015). Researchers dedicated to the issue (Hargis, 2020; Kim & Bonk, 2006; Thomas & Dello Stritto, 2021) draw attention to the fact that it first requires a pedagogical approach in line with the learners' needs (and only later a technological approach) in order to provide learning opportunities. In the same spirit of constructionist pedagogical interpretations, decoding and terminological/action clarifications were developed by Chickering and Ehrmann in 1996 *Seven Principles of Good Practice* (Tanis, 2020).

Studies focused on exploring the online teaching-learning process

The studies which are related to the concept of online teaching-learning are approached from two directions: as theoretical studies, which analyse the concept, the effectiveness of the action, dissect the organisation issues but also the achievements and offer suggestions for further valorisation and development (Hofer et al., 2021; Sun & Chen, 2016; Islam et al., 2015; Nawar Al-Saadi, 2017); as empirical research, to verify assumptions or to gain knowledge of perceptions belonging to those directly or indirectly involved in the process.

There are new directions for research on online teaching and learning as follows:

- Teachers' and instructors' perspectives (Blonder et al., 2022; Islam & Mondal, 2022; Oparaji et al., 2022; Radmehr & Goodchild, 2022; Almahasees et al., 2021; Bekker & Nazir, 2021; Hofer et al., 2021; Thomas & Dello Stritto, 2021; Ayu, 2020; Mishra et al., 2020; Naik et al., 2020; Sadiku et al., 2018; Nawar Al-Saadi, 2017; Islam et al., 2015; Kim & Bonk, 2006). The evidence generated by such studies confirms and supports the idea which, given the highly complex nature of online teaching-learning, it is an equally dynamic and challenging reality for both new and experienced teachers, those who have already taught online for a while or those who are just starting out. It calls for necessary continuous professional development that should include the development of both digital and psycho-

pedagogical competence, with a focus on effective course design, instruction, implementation and evaluation (Nawar Al-Saadi, 2017). Pedagogically, there is also a need to adapt and adjust the teaching methods to the specificity of the online process (Kim & Bonk, 2006), which is why studies providing echoes of the experiences of trained teachers/experts on the topic are useful (Thomas & Dello Stritto, 2021);

- Students' perspective on the process (Boghian et al., 2023; Duţă, 2023; Nikolenko et al., 2023; Islam & Mondal, 2022; Laili & Nashir, 2022; Lamanauskas et al., 2022; Radmehr & Goodchild, 2022; Soliman et al., 2022; Abu et al., 2021; Alexa, 2021; Almahasees et al., 2021; Aziz Ansari et al., 2021; Fyllos et al., 2021; Hofer et al., 2021; Saurabh et al., 2021; Seifert, 2021; Ayu, 2020; Coman et al., 2020; Mishra et al., 2020; Sadiku et al., 2018; Brittany, 2015). The data highlighted by such studies underline the need for a joint teacher-student effort and a stronger commitment from both partners to create an online learning community that ensures a higher level of interaction and collaboration (Thomas & Dello Stritto, 2021; Kim & Bonk, 2006) between them as well as between students (Nawar Al-Saadi, 2017);
- Views on the benefits and challenges of online teaching and online learning in the academic environment (Boghian & Cojocariu, 2023; Boghian et al., 2023; Nikolenko et al., 2023; Blonder et al., 2022; Radmehr & Goodchild, 2022; Soliman et al., 2022; Alexa, 2021; Aziz Ansari et al., 2021; Bekker & Nazir, 2021; Hofer et al., 2021; Saurabh et al., 2021; Ayu, 2020; Coman et al., 2020; Naik et al., 2020; Sadiku et al., 2018; Cojocariu et al., 2016; Brittany, 2015; Gilbert, 2015; Nawar Al-Saadi, 2017; Cojocariu et al., 2014; Bolliger & Wasilik, 2009; Kim & Bonk, 2006). These are numerous, at times ambivalent, and are sometimes analysed in comparison with the face-to-face teaching process;
- Perspective of the academic management (Duţă, 2023; Laili & Nashir, 2022; Soliman et al., 2022; Abu et al., 2021; Fyllos et al., 2021; Hofer et al., 2021; Saurabh et al., 2021; Thomas & Dello Stritto, 2021; Hargis, 2020; Mishra et al., 2020; Cojocariu et al., 2014; Bolliger & Wasilik, 2009; Kim & Bonk, 2006). Studies indicate the need for universities to ensure a long-term strategy for introducing, improving and leveraging online teaching-learning. In addition, there is a need for constant acquisition of new technologies, software and

infrastructure elements, training of teachers for online teaching-learning (Kim & Bonk, 2006), appropriate, continuous and competent technical support for teachers and students (Thomas & Dello Stritto, 2021; Nawar Al-Saadi, 2017; Kim & Bonk, 2006);

- Employers'/graduates'/community's perspective (Naik et al., 2020; Tanis, 2020). There are very few studies focusing on the issue of online learning in relation to employers, which implies the need to implement new research.

The academic learning experiences during the pandemic period led to the immediate psycho-pedagogical reflection towards new lessons to be learned, simultaneously towards many aspects of the teaching process, older or newer, but equally important such as: learners' satisfaction with online teaching and learning (Nikolenko et al, 2023); online teaching-learning - more difficult processes than those conducted face-to-face (Krull & De Klerk, 2021); online teaching-learning - more efficient than the face-to-face ones. To what extent is online teaching-learning associated with stress? (Boghian & Cojocariu, 2023); how to build trust in an online learning environment (Wang, 2014) or to others, which are not yet visible? Precisely because online teaching-learning in the academic environment is a long-term certainty, it is natural that after the pandemic period, wide debates have been activated about the path which needs to be developed in order to achieve a high-quality online educational process (Nikolenko et al., 2023). In any case, one should not ignore the reality that both current theories and practices "in e-learning are not simple or coherent, which means that the application of this solution occurs irregularly, randomly, and with varying degrees of success" (Ayu, 2020, p.48).

An integrative model of successful online education in HE institutions

In this study, an integrative model of online teaching and learning in an academic context is developed based on the adaptation of current theories and approaches. Abuhassna et al. (2020) developed a new design for using online platforms so as to improve students' academic outcomes and satisfaction. Sailer et al. (2021) proposed the C þ -model, which provides an integrative, comprehensive framework to highlight contextual factors of technology-based learning activities. There is a series of various factors which can have a potential influence on the students' learning outcomes in the online education at the university level, such as: teachers' and students' knowledge, skills, and attitudes; teachers' training level; institutional, organisational, and administrative factors; teachers' level of digital

technology use; students' digital technology equipment and available learning opportunities. Considering the technological aspects designed by Tsang et al. (2021) related to the online education efficiency, Soliman et al. (2022) identified the following predictor variables: peer collaboration, instructor-student communication, course design, academic support, resources and skills. Kaouni et al. (2023) created an intelligent and dynamic adaptive learning model based on artificial intelligence, in order to identify and provide customised learning contexts tailored to the learners' needs.

The main elements generating successful online teaching and learning in academic settings refer to teacher's skills, students' learning opportunities, and institutional factors (Figure 1).

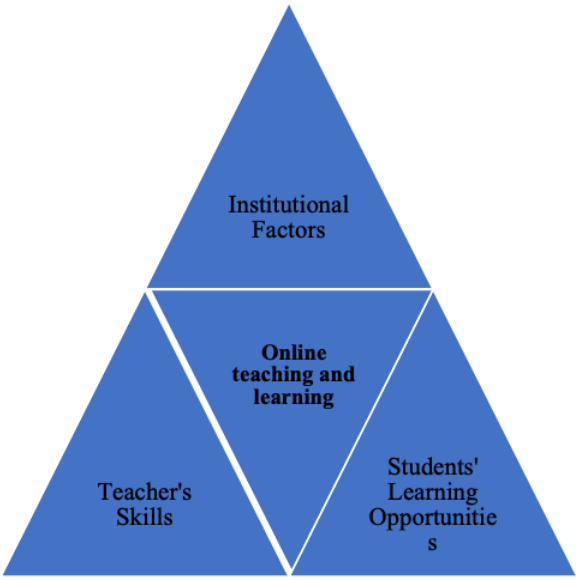


Figure 1. The integrative model of online teaching and learning in an academic context

Research objectives and hypotheses

The hereby study is focused on identifying certain types of perceptions which students have regarding online learning.

Research hypotheses

General hypothesis 1

Students prefer online learning for lecture and seminar activities.

General hypothesis 2

The level of technology skills development is high in students' perception.

General hypothesis 3

Online learning has multiple positive effects in students' perception.

General hypothesis 4

The difficulties of teaching and learning online are perceived differently by students.

Research methodology

Operationalising concepts and defining variables

The main concept of online learning was operationalised into four components, which correspond to the following aspects: preference for the type of learning, development of technological skills, positive effects of using online learning, difficulties of online learning.

The dependent variables are represented by the four dimensions of online learning. The independent variables are as follows: age (20-32 year-olds, 33-45 year-olds, 46-58 year-olds), residence (urban, rural), number of people in the family who have learnt online, educational level (Bachelor's degree student, Master's degree student).

Participants

The research group consists of 355 participants being structured on the independent variables which are presented in Table 1.

Table 1. Distribution of the research group based on independent variables

Independent variables	Distribution of the research group
Age	- 209 between 20 and 32 years old (58.9%); - 102 aged between 33 and 45 (28.7%); - 44 aged between 46 to 58 (12.4%)
Area of residence	- 219 in urban areas (61.7%); - 136 in rural areas (38.3%)
Educational level	- 285 Bachelor's degree students (80.3%); - 70 Master's degree students (19.7%)

Method

As part of our present research, a questionnaire was developed to quantify students' opinions about online learning in academic settings. Our questionnaire comprises 15 closed-ended items. The Likert scale with different response variants was used as a tool (Table 2).

Table 2. Characteristic aspects of online learning

Characteristics of online learning	Items	Likert Scale
Preference for educational activities	preference towards the type of learning in lectures (I1)	1 - traditional learning; 2 - online learning; 3 - hybrid learning
	preference towards the type of learning in seminars (I2)	
Development of technological skills	general level of technological skill development (I4)	1 - to a very limited degree; 2 - to a limited degree; 3 - to some degree; 4 - to a high degree; 5 - to a very high degree
	specific level of skill development in the use of mobile devices with online learning (I6)	
Positive effects of using e-learning	motivation boost/stimulation (I7) effective learning (I8) facilitating the development of projects and assignments in online learning (I9)	1 - totally disagree; 2 - disagree; 3 – neither agree nor disagree; 4 - agree; 5 - strongly agree
	supporting task solving and group projects (I10) increasing free time (I11) efficiency in other activities (I14)	
Difficulties of online learning	Internet access problems (I3)	1 - cost of internet subscription; 2 - signal quality; 3 - lack of appropriate technological equipment for educational needs
	need for technical assistance with online educational activities (I5)	1 - to a very limited degree; 2 - to a limited degree; 3 - to some degree; 4 - to a high degree; 5 - to a very high degree
	existence of bodily changes (I13)	
	how online learning was experienced (I12)	1 - extreme level of source of stress; 2 - very high level of source of stress; 3 - relatively high level of source of stress; 4 - medium level of source of stress; 5 – low level of source of stress; 6 - very low level of source of stress; 7 - no stress
	how physical discomfort is experienced in the body (I15)	1 - at eye level; 2 - at head level; 3 - at back level; 4 - at body level; 5 - not applicable

Research procedure

The questionnaires were administered between October 2020 and February 2021 to students at "Vasile Alecsandri" University of Bacau, Romania. The questionnaire was developed by using the Google Form tool and was administered online. A total of 357 questionnaires were registered, of which 2 were discarded because they were partially completed.

Data analysis

Our gathered data records were interpreted by using the SPSS 20 programme (Labăr, 2008).

Ethical issues

Ethical approval is required according to the statute of the Declaration of Helsinki, considering that the conducting of the study involved human subjects.

Results

Regarding the preference towards the educational activities in higher education, the data in Table 3 indicates that 39.4% of the participants prefer online learning to lecture activities, while 38.6% of them value traditional learning to seminar activities.

Table 3. Frequencies and percentages of responses regarding the preference for learning activities

Preference for educational activities	preference towards online learning in lectures		preference towards online learning in seminars	
	Frequency	Percent	Frequency	Percent
traditional learning	90	25.4	137	38.6
online learning	140	39.4	118	33.2
hybrid learning	125	35.2	100	28.2
Total	355	100.0	355	100.0

Regarding the level of development of technological skills, the overall statistical mean is 3.70 and 3.46 for mobile device skills (Table 4).

Table 4. Statistical mean, median and standard deviation with reference to the level of development of technological skills

	level of technology skills development	use of mobile devices
Mean	3.70	3.46
Median	4.00	3.00
Std. Deviation	.793	1.039

The data in Table 5 show that the positive effects of e-learning valued by students and Master's students are the following: support in solving group tasks and projects (3.87), ease in developing projects and assignments (3.65), increase in free time (3.64), efficiency in other activities (3.52). Lower statistical means indicate the participants' indecision about boosting motivation (3.04) and effective learning (2.80).

Table 5. Statistical mean, median and standard deviation with reference to positive effects of e-learning

	motivation boosting	efficient use of knowledge	facilitation of projects and assignments	development support for solving tasks and group projects	leisure time increase	efficiency in other activities
Mean	3.04	2.80	3.65	3.87	3.64	3.52
Median	3.00	3.00	4.00	4.00	4.00	4.00
Std. Deviation	1.177	1.120	1.156	1.015	1.176	1.088

The data in Table 6 show that the statistical means have low values for the difficulties of e-learning, such as need for technical assistance (1.79), some existence of bodily changes (2.52). Participants rated these difficulties as low, which shows the positive perception towards online learning.

Table 6. Statistical mean, median and standard deviation with reference to online learning difficulties

	need for technical assistance	existence of bodily changes
Mean	1.79	2.52
Median	2.00	2.00
Std. Deviation	.849	1.254

According to the data in Table 7, 84.2% of the participants consider that the signal quality is the major issue in the online learning.

Table 7. Frequencies and percentages of responses related to Internet access problems

	Frequency	Percent
cost of internet subscription	16	4.5
signal quality	299	84.2
lack of a technological device suitable for my educational needs	40	11.3
Total	355	100.0

In terms of how online learning was experienced, 96 participants, representing 27%, considered that it was not a source of stress and 84 of them considered it to be a medium-level of stress.

Table 8. Frequencies and percentages of responses regarding how online learning was experienced

	Frequency	Percent
extreme level of source of stress	10	2.8
very high level of source of stress	14	3.9
relatively high level of source of stress	41	11.5
medium level of source of stress	84	23.7
low level of source of stress	67	18.9
very low level of source of stress	43	12.1
no stress	96	27.0
Total	355	100.0

The data in Table 9 show how online learning physically affects students regardless of the compared study cycles. Therefore, 144 respondents, representing 40.6%, have identified physical discomfort experienced in their body.

Table 9. Frequencies and percentages of responses on how physical discomfort is experienced in the body

	Frequency	Percent
at eye level	37	10.4
at head level	8	2.3
at back level	56	15.8
at body level	144	40.6
not applicable	110	31.0
Total	355	100.0

Discussions

Our research data show that HE students, both at the Bachelor's and Master's degree level, prefer online lectures and traditional face-to-face seminars as opposed to the research carried out by Li et al. (2023) emphasises on the choice of traditional teaching by 80% over 20% for online learning. Aziz & Ansari (2021) also add that 62% of students expressed satisfaction with online learning. Furthermore, Marcus (2022) states that the best approach to teaching in HE is blended, i.e. combining physical and virtual learning. Utami et al. (2022) highlight as well the reasons why students prefer both synchronous and asynchronous learning: synchronous, as there is direct interaction between learners and teacher, and asynchronous, for the provision of materials or assignments and submission of homework. Soliman et al. (2022) claim that students' satisfaction with online learning depends on various factors, including skills and resourcefulness.

Our findings testify that the development of technology skills is generally higher than mobile device skills. Other studies (Tanjung & Utomo, 2021) have also shown that the respondents have digital skills in using apps or other online platforms that allow students to learn course materials independently. The results of the research initiated by Ahmad (2020) indicate that students have an overall positive perception towards mobile phones as useful tools in learning activities. The data analysis presented in a study conducted by Okoye et al. (2023) shows that quality training, internet access and infrastructure are important factors which contribute significantly to increasing the level of digital technology use in the educational activities at the university level.

In terms of participants' perception, the appreciated positive effects of e-learning are as follows: helping to solve group tasks and projects, facilitating the elaboration of projects and assignments, increasing free time, efficiency in other activities. The data from the study initiated by Curelaru et al. (2022) also highlight the positive aspects of online learning and its consequential benefits, such as: convenience and accessibility, time and cost saving, psychological and medical security. The advantages of online learning identified in other studies (Maya et al., 2022; Nishimwe et al., 2022) include increased technical skills, flexibility of study time, ensuring participation in multiple educational webinars, accountability.

Our study participants appreciated to a lesser extent the difficulties of online learning: the need for technical assistance, the existence of bodily changes. According to the research conducted by Almahasees et al. (2021)

and Nishimwe et al. (2022), the challenges of online learning are various, namely difficult adaptation to online education - especially for students with special needs, lack of interaction or motivation, technical problems, limited internet access, partial data privacy and security issues. The negative aspects of online learning identified in another study are grouped into two main categories (Curelaru et al., 2022): on the one hand, *health and psychosocial issues*, such as stress, anxiety, low motivation, isolation/loneliness and boredom and on the other hand, *learning difficulties*, namely misunderstandings, additional academic demands, lack of challenge, of feedback, or of engagement.

Most participants in our study considered that online learning was not a source of stress. The results of other studies (Fyllos et al., 2021) also indicate low levels of stress among the participants during the online lectures. In addition, many respondents indicated that they experienced some physical discomfort in the body after participating in the online activities.

Zhu et al. (2022) recommend managing tailored online processes and services, by constantly stimulating students' enthusiasm for online learning, and cultivating their ability to learn independently, in order to enable the sustainability of online education in the academic environment.

Conclusions

Our research results reflect students' perceptions regarding these four characteristic elements: preference for type of learning, development of technological skills, positive effects of using online learning, difficulties of online learning. HE students prefer online teaching for lectures and traditional learning for seminars, regardless of their study cycle. Survey respondents' perceptions are higher for the general development of technological skills and lower for the use of mobile devices. The positive effects of online teaching and learning appreciated by the participants refer to helping to solve group tasks and projects, facilitating the elaboration of projects and assignments, increasing free time, and efficiency in other activities. The difficulties of online teaching and learning were perceived by respondents to a lesser extent. Furthermore, most participants in our study considered that online learning was not a source of stress.

We must consider some of the shortcomings of the research: a. the relatively small number of respondents participating in the research and the need to extend the sample to more universities; b. the relatively low representativeness of the results (regionally) and the need to increase it by

extending the research effort associated with the study to other partner institutions in the country or abroad.

Future research directions to be explored from the perspective of online learning are diversity, opportunity, so that online learning becomes a way to increase availability and accessibility. They further inspire higher education institutions to continually rethink and redefine online technological methods and didactics.

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