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Factors determining satisfaction with e-learning during the pandemic in the opinion of Polish and Spanish students: analysis of differences and similarities

Renata Marciniak

Grażyna Rembielak

Abstract

E-learning has become a challenge for many universities worldwide, which during the pandemic had to switch overnight from offline to online learning and meet the expectations of students for whom this form of education was often alien. The aim of the paper is to present how students from two different countries, Spain and Poland, perceived e-learning during the pandemic, what factors, in their opinion, influenced their satisfaction with this form of education, which of them decreased it; and what are the similarities and differences in their opinion. In order to get to know their opinions, an online survey was conducted with students at the University of Manresa (Spain), and telephone interviews with students of the Warsaw University of Technology Business School. A comparative analysis of the obtained results was then performed to determine the similarities and differences in the satisfaction with e-learning between the Spanish and Polish students. The study shows that the main factors satisfying both groups of students are the possibility to use digital didactic materials, the quality of e-learning platforms, the organisation of e-learning, and the support provided by universities and lecturers. The most significant differences were visible in the perception of online classes, the formula for completing the course, and the didactic activities for students. The research results lead to the conclusion that despite the cultural differences and different teaching systems, the factors satisfying students with e-learning in the two countries were in fact quite similar.

Keywords: e-learning, e-learning satisfaction, online education, quality of education, higher education

Introduction

COVID-19 caused the closing of on-campus studying at universities worldwide, resulting in nearly 10 million students pursuing their studies outside of university walls. Higher education changed radically as a result, moving from lecture halls to online classes. Overnight, e-learning[1] became a panacea for solving the crisis in higher education. It was a completely new experience and a big challenge for many universities and students, as e-learning had previously been alien to them. After one year of online classes it is good to understand what factors, in the opinion of students, influenced their satisfaction with this form of education.

As emphasised by several authors (Almusharraf & Khahro, 2020; Prodanović & Gavranović, 2021; Segovía-García & Said-Hung, 2021; Watts, 2019; Wei & Chou, 2020), the inevitable and essential criteria for creating a high-quality educational context in

Renata Marciniak, Universitat de Vic-Universitat Central de Catalunya, Campus Manresa, Spain, ⓘ https://orcid.org/0000-0003-1866-5185

Grażyna Rembielak, Warsaw University of Technology Business School, Poland, ⓘ https://orcid.org/0000-0002-6390-925X

[1] In this paper, we define e-learning (also known as online education, distance learning, virtual learning, online learning, distance learning or learning in a virtual learning environment) as a form of learning characterised by the physical separation of the lecturer and student, between which two-way communication is dominant, and asynchronous, where the Internet is mainly used as a means of communication and knowledge distribution, which means that students have to manage their own learning process, usually with the help of a lecturer and / or tutor (Marciniak, 2022).

a virtual environment are students' perspectives and thoughts on those aspects of the processes in which they are active participants. As identified by the participants, the advantages and disadvantages of these processes are a signpost for educational institutions to make improvements. Moreover, as Żuraw (2015) claims, determining the level of satisfaction in the case of researching participants "allows for assessing the quality of education in a given field of study and university, as well as formulate reports and summaries that are the subject of rankings prepared, for example, by government institutions" (p. 127). According to the UNE 66181: 2012 standard established by the Spanish Association for Standardisation and Certification (AENOR, 2012), student satisfaction is the main factor determining the quality of e-learning, and their opinions should be taken into account when planning, organising, and implementing this form of education.

In Poland some universities and organisations examined the level of student satisfaction with e-learning during the pandemic, which allowed them to identify the said level.

For example, the Flow Research Centre (Flow Centrum Badawcze, 2020) conducted a nationwide survey of Polish students' opinions on e-learning during the pandemic, with 1,232 students from 76 Polish universities taking part in the study. Students were unsatisfied with their lecturer, the inconvenience of contact with their family, difficulties in obtaining a scholarship, and other reasons, such as the inconvenience of being with roommates, lack of access to university laboratories, reduced motivation to study, and also routine. There is no information about the benefits of e-learning in this survey.

According to students from the University of Economics in Katowice, e-learning is a convenient form of studying, but it does not replace face-to-face meetings with a lecturer. Among the positives, the students indicated the possibility of using intuitive ICT tools and software that facilitate studying. On the other hand they negatively assessed online exams, which exacerbated stress (Warchala, 2020).

The results mentioned above of research on the satisfaction of Polish students with e-learning, and others that we could cite here, are a significant contribution to the development of knowledge on the quality of academic e-learning from the students' point of view. However, we believe that an interesting and more holistic view of this issue is to examine whether students in other countries perceived e-learning in the same way as Polish students during the pandemic, what advantages and disadvantages they indicated most often, and whether their opinions were similar. In this paper we attempted to answer these research questions by identifying student satisfaction factors based on literature on the subject, analysing the results of research conducted by researchers from different countries in this area, and our own measurement of student satisfaction with e-learning during the pandemic in two countries – Spain and Poland.

Students' satisfaction factors with z e-learning based on literature on the subject

The definition and measurement of participants' satisfaction with e-learning is a complex process, mainly due to the number of factors influencing this satisfaction, such as communication, participation in online discussions, flexibility, workload, technological support, teaching and teaching competencies of the lecturer, as well as feedback (Marciniak & Gairín Sallán, 2018).

According to the previously quoted standard UNE 66181:2012, the factors that determine the satisfaction of students with e-learning are the possibility of obtaining employment after completing the e-learning course (to what extent the completed course will increase the likelihood of getting a job or promotion), the availability of the course and the teacher, and the methodology of education.

The satisfaction with e-learning is also influenced by institutional support provided to participants, technological support, course structure, didactic strategies used by the lecturers, the support provided to participants, and strategies for assessing participants' achievements (Online Learning Consortium, n.d.).

For Prodanović and Gavranović (2021), students' satisfaction with e-learning is related to the organisation of online classes, teaching methods and dynamics, the variety and availability of teaching materials and necessary information, communication with lecturers and other participants, and participants' satisfaction with their learning progress.

Keržič et al. (2021) found nine factors that influence the students' satisfaction with e-learning during the COVID pandemic, namely: mode of delivery, home infrastructure, information quality, online instructions, services quality, online interaction with colleagues, teachers, and administration staff, computer skills, perceived student satisfaction, perceived student performance.

When analysing the above-proposed factors influencing the participants' satisfaction with e-learning it can be seen that there is no unanimity among the authors in this respect, which makes its measurement difficult. For some the main determinant is the human factor (commitment and preparation of lecturers), while for others the didactic and technological aspects, and for others, the institutional context or home conditions.

A review of worldwide students' satisfaction with e-learning during the COVID-19 pandemic

Achieving high student satisfaction with e-learning during the pandemic was a challenge for all universities worldwide. Many of them conducted a measurement of this satisfaction in order to identify the main factors contributing to its high and low

levels. Research results show that student satisfaction varies across countries.

Indonesia

Surahman and Sulthoni (2020) conducted a study to determine student satisfaction with the quality of online learning in Indonesian higher education during the Covid-19 pandemic in the following areas: satisfaction with the learning process, satisfaction perception, satisfaction with the lecturer, and satisfaction with the technical support. Their findings showed that 40% of Indonesian students were not satisfied with e-learning during the pandemic, mainly due to the limited access to the Internet, the low level of preparation and commitment of professors to conduct online classes, unclear teaching materials, lack of support from lecturers (they did not guide students properly). Students complained about the lack of constructive feedback on their work, but recognised opportunities to explore the use of technology for learning as one of the main advantages of e-learning.

Afghanistan

Hashemi (2021) assessed the effects of COVID-19 on the academic performance of Afghan students and their level of satisfaction with online teaching. The findings showed that Afghan students were very dissatisfied with this form of education, mainly due to the poor quality of work of the teachers, who did not engage in online sessions, did not provide feedback to students, and did not interact with the students enough. Another factor reducing the level of satisfaction was the lack of technical support from both teachers and the university, the university's lack of online learning policy, an inadequate student evaluation system, and the lack of online education for students. The authors' study also found that COVID-19 negatively affected students' performance in many aspects, such as their ability to perform tasks correctly during the course, the results of these activities, and their assessment.

China

China was the first country to switch from traditional to online education. As shown by the study results by She et al. (2021), Chinese students generally enjoyed their experience with e-learning during the pandemic. The authors point to three factors that, in their opinion, influenced the satisfaction of Chinese students with online education during the pandemic:

- interaction with instructors, peers, and content),
- academy self-efficacy understood as faith in one's own ability to perform tasks and achieve set goals (Saeid & Eslaminejad, 2017),
- student engagement, which includes behavioral, emotional, and cognitive engagement.

The study results indicate that Chinese students who interacted more frequently with the faculty and other students, and used teaching materials more often, showed higher satisfaction levels with e-learning. These interactions also improved the students' academic self-efficacy. Students with a higher self-efficacy were more willing to take up challenges and engage in educational activities, which increased their satisfaction with e-learning.

Other countries

Keržič et al. (2021) conducted a large-scale (sample of 10,092 students) student satisfaction surveys with e-learning during the first phase of the pandemic in ten countries: Chile, Ecuador, India, Italy, Mexico, Poland, Portugal, Romania, Slovenia, Turkey. Findings show that students' satisfaction resulted mainly from the high-level of administrative and technical support provided by the university and the learning assistance through tutors. The online library, involving professors in the teaching process and their timely feedback, and the quality of the technical infrastructure (educational platform), were other factors influencing student satisfaction. Their high quality increased the level of students' satisfaction with e-learning. Moreover, the research showed that interactions with lecturers and other students and students' digital competencies were an important satisfying factor, but not the most significant one. Learning outcomes had a large impact on student satisfaction; the higher they were, the higher was the satisfaction with learning online.

Methodology

The main aim of the study was to identify the factors of satisfaction of Polish and Spanish students with e-learning during the COVID-19 pandemic and identify similarities and differences in their opinions, and then compare the obtained results with literature on the subject to establish the main determinants of student satisfaction with this form of education, as well as actions that, in the opinion of students, universities should take to improve the quality of e-learning in the future.

In order to achieve the above mentioned aim of the study, it was necessary to answer the following research questions:

1. What was the level of satisfaction of Polish and Spanish students with e-learning during the COVID-19 pandemic?
2. What factors determined the level of satisfaction of Polish and Spanish students with e-learning? Did both groups of students indicate the same factors?
3. Were differences in education levels a factor differentiating the assessment of the degree of student satisfaction with e-learning during the pandemic?
4. What were the advantages and disadvantages of e-learning during the pandemic, according to the surveyed students? Were they convergent?

5. What actions, in the opinion of students, should universities take to improve the degree of student satisfaction with e-learning in the future, and thus its quality? Were the activities proposed by both groups of students the same?

In order to find the answers to the above questions an analysis of the literature on the topic and the results of research conducted by other authors on the satisfaction of students with e-learning during the pandemic in various countries of the world was used, as well as own research in this area carried out at Polish and Spanish universities.

The study was conducted as part of a research collaboration between the Spanish University of Manresa (UManresa), situated in the heart of Catalonia (an hour from Barcelona), and the Warsaw University of Technology Business School (WUT BS). UManresa offers degrees in Business Administration, Early Childhood Education and Health Sciences, while the WUT BS offers a range of non-degree postgraduate programmes. Due to the nature of the studies provided by the cooperating universities, the study was conducted among students of two different levels of education, which was an advantage of the undertaken research, allowing it to answer the third research question.

The main research technique was an online survey with UManresa students and telephone interviews with Warsaw University of Technology Business School students. The main research tool was a survey and interview questionnaire containing 9 questions, including 3 closed questions with two possible answers (yes, no), one question with a Likert scale from 1 to 5, one question with a quantitative scale, and 4 additional open questions. Questionnaires with the same questions were prepared in two languages: for students of UManresa – in Catalan, and for students of WUT BS – in Polish. The questions concerned the following areas:

1. Conditions for digital learning.
2. Technical equipment for digital learning.
3. Quality of digital learning.
4. Organisation of digital learning.
5. Quality of the content.
6. Quality of the didactic materials.
7. Advantages of digital learning.
8. Disadvantage of digital learning.
9. Suggestions regarding the improvement of digital learning.

The areas listed above were most often mentioned by the authors of the works analysed in point 2 of this paper; it was therefore decided to include them in the study, which was carried out at the turn of March and April 2021.

In the case of the Umanresa University the questionnaire was sent by e-mail to 187 students of Early Childhood Education (EI) and Business Management and Management (ADE), 52 of whom returned a completed, valid questionnaire. However, in the case of WUT BS students, an individual telephone interview

approach was chosen. It was assumed that the study would be conducted on the same research sample as in UManresa, i.e., 50 students of five selected postgraduate programmes, 10 representatives for each programme: MBA Programme, Certificate in Business for Engineers, ACCA, Renewable Energetics and Interdisciplinary Studies of Pharmacy Managers. The interview was computer-assisted, and the selection of the research group was random. The use of various research techniques (online questionnaires and telephone interviews) allowed us to draw a conclusion regarding the influence of the research technique on the assessment of student satisfaction and the reliability of the information obtained.

A pilot survey was conducted on 15 students, using the personal interview method. This was done to ensure that the questions asked were unambiguous, which resulted a revision of some of the questions of the survey.

Having collected filled-in questionnaires correctly, their quantitative and qualitative analysis was performed. Using the statistic programme for the quantitative analysis enabled us to collect and analyse numerical data gathered from the questionnaires. The qualitative research was conducted based on the students' comments that justified their evaluation and recommendations for the quality of e-learning improvement.

The results obtained from the study were compared, which allowed us to determine the similarities and differences in students' satisfaction with e-learning obtained during the COVID-19 pandemic.

Research results: a comparative analysis of students' satisfaction with digital learning

The research results indicate that a similar number of students from both universities responded positively to digital learning during the pandemic. Their satisfaction was greatly influenced by the fact that most of them had adequate premises for online studies (Table 1) and appropriate equipment for remotely conducted activities (Table 2).

However, when carefully analysing the obtained results, some differences in the level of student satisfaction can be noticed. One of them is satisfaction with online classes (Table 3). More Polish students

Table 1

Students' answers to the question: Do you have suitable conditions for distance learning?

Answer	% respondents	
	UManresa (Spain)	WUT BS (Poland)
Yes	92%	90%
No	8%	10%

Source: authors' own work.

Table 2
Students' answers to the question: Do you have appropriate technical equipment for distance learning?

Answer	% respondents	
	UManresa (Spain)	WUT BS (Poland)
Yes	96%	96%
No	4%	4%

Source: authors' own work.

Table 3
Students' answers to the question: How do you generally rate the quality of digital learning? (1 is very poor, 5 is very good)

Rating	% respondents	
	UManresa (Spain)	WUT BS (Poland)
5 – very good	19%	23%
4 – good	42%	53%
3 – neutral	34%	20%
2 – poor	5%	4%
1 – very poor	0%	0%

Source: authors' own work.

(76%) rated their satisfaction with digital learning as very good or good, while only 61% of Spanish students were very highly and highly satisfied with digital learning.

Satisfaction with the organisation of digital learning

Organising digital learning involves gathering and configuring the resources necessary to implement an online learning programme (human, material, and technological). As shown in Table 4, more Polish than Spanish students assessed the digital learning organisation as very good or good. Only 2% of Spanish students viewed the organisation of their digital learning as insufficient.

Table 4
Students' answers to the question: How would you rate the organisation of digital learning? (1 – very poor, 5 – very good)

Rating	% respondents	
	UManresa (Spain)	WUT BS (Poland)
5 – very good	21%	28%
4 – good	46%	60%
3 – neutral	23%	6%
2 – poor	8%	6%
1 – very poor	2%	0%

Source: authors' own work.

Satisfaction with the content of digital learning

The thematic content of digital learning, or educational content, is the resource of facts, concepts, information, regularities, and theories passed on by the teacher in the education process. It constitutes the content of the teaching process, the planned and expected consequence of which is the learning outcomes. As can be seen in Table 5, the satisfaction of both groups of students with the content of digital learning was very similar and assessed quite highly by both Spanish and Polish respondents.

Table 5
Students' answers to the question: How do you rate the quality of the content of digital learning? (1 is very poor, 5 is very good)

Rating	% respondents	
	UManresa (Spain)	WUT BS (Poland)
5 – very good	21%	19%
4 – good	57%	56%
3 – neutral	25%	19%
2 – poor	4%	6%
1 – very poor	0%	0%

Source: authors' own work.

Satisfaction with the quality of teaching materials

The research assumed that the quality of teaching materials is primarily influenced by their diversity, quantity, and attractiveness. The quality of teaching materials understood in this way was assessed quite highly by both groups of the studied students (Table 6). Nevertheless, a slight difference is evident in the students' perceptions of the quantity and attractiveness of these materials. 82% of Spanish students believe that the materials available on the platform were sufficient and attractive (76%), while for 67% of Polish students the materials were sufficient and attractive (64%).

Table 6
Students' answers to the questions regarding the didactic materials

Questions	UManresa (Spain)		WUT BS (Poland)	
	Yes	No	Yes	No
Did you have access to various didactic materials?	91%	9%	89%	11%
In your view, were the didactic materials sufficient?	82%	18%	67%	33%
Were the didactic materials for the classes attractive?	76%	24%	64%	36%

Source: authors' own work.

Strengths of digital learning

Digital learning has many advantages and disadvantages. When analysing Table 7 it can be seen that both Polish and Spanish students considered the lack of necessity to travel to face-to-face classes as the main advantage of digital learning. This saves time and helps avoid travel and accommodation expenses. Another advantage for both groups of students was the flexibility and convenience of studying, with the possibility to participate in classes from anywhere. The teaching materials placed on the platform were also a significant benefit, allowing for permanent access to them. The Spanish students also appreciated the practical activities (tasks, exercises, discussions, and others) carried out during the online classes and the opportunity to present their work online, as they felt less stressed than during face-to-face presentation. Polish students did not pay attention to these aspects but pointed at other factors that the Spanish students did not mention. For example, while working on a computer they could easily use the Internet and quickly search for data or check incomprehensible terms, making it easier to take notes and use additional didactic resources.

Weaknesses of digital learning

Regarding the disadvantages of digital learning, both Polish and Spanish students mentioned numerous examples (Table 8). They considered the most significant difficulty in maintaining concentration for a long time, which reduced learning effectiveness. Another drawback was the lack of personal contact with lecturers and other students, which led to a feeling of isolation and loneliness and made it challenging to perform team tasks. A group of students assessed the online classes as not very dynamic. Polish students

also lacked a lively atmosphere in contrast to their experience during the face-to-face courses, which made the online classes long and tiring. The surveyed students from both universities also mentioned difficulties in implementing teamwork caused mainly by the lack of face-to-face interaction.

For a large group of Spanish students a weak Internet connection was a reasonably significant obstacle regarding online classes. In contrast, only a few Polish students complained about problems with the Internet. Some students from the Spanish university were dissatisfied with online exams, which caused them additional stress, while Polish students did not mention such issues.

Polish students found the mixing of student and home duties a disadvantage of digital learning, which made them less involved in the learning process, meaning they benefited less from the classes. Some pointed to the lack of a lively atmosphere compared to face-to-face courses, some to lecturers starting classes late, and others to the need to spend time in front of the computer over the weekend after spending the whole week in front of the computer.

All these contributed to the perception of digital learning as a demanding form of studying, which was considered a disadvantage by some Spanish and Polish students.

Suggestions for improvement of digital learning

As for students' suggestions regarding the improvement of digital learning, there are definitely differences in the proposals (Table 9). For Polish students a good solution in the future would be the online streaming of face-to-face classes, which would allow them to choose the form of class participation. Other improvements include increasing the interac-

Table 7

Students' answers to the question: What was the most significant advantage of digital learning?

The advantages of digital learning	% respondents*	
	UManresa (Spain)	WUT BS (Poland)
Possibility to participate in online classes	21%	4%
Online recording of classes and the possibility to play them back at any time	14%	4%
Easier contact with the lecturer	12%	2%
Practical exercises during online classes	12%	0%
An easier way of taking notes and the possibility to check incomprehensible terms on the Internet	6%	8%
Cost savings due to no need to buy tickets or petrol	6%	4%
Flexibility and convenience. No restrictions on the place of classes	4%	16%
Possibility of returning to didactic materials	4%	2%
Remote formula – one platform for different needs (on Zoom – lecture, group work, interactive board)	4%	4%

Note. The results do not add up to 100% because the students were not limited to one answer.
Source: authors' own work.

Table 8
Students' answers to the question: What was the biggest disadvantage of digital learning?

The disadvantages of digital learning	% respondents*	
	UManresa (Spain)	WUT BS (Poland)
Problems with the Internet	33%	4%
Difficulty concentrating during online classes (mainly due to distracting factors at home, e.g., noisy neighbour, babies crying, etc.)	27%	20%
Lack of personal contact with the lecturer and other students	25%	42%
Difficulties in the implementation of team tasks	15%	12%
Limited ability to present the student's work (too little time)	12%	0%
Low dynamics of classes	13%	6%
Little interaction between the lecturer and students	13%	0%
A small number of practical classes	12%	0%
Very limited time to complete online exams	8%	0%
Excess of extracurricular work given by lecturers	8%	0%
Some lecturers are not prepared well to conduct online classes	6%	4%
Difficulty understanding complex content	4%	0%
Little support from lecturers	4%	0%
Burdensome and demanding form of education	4%	0%
Loneliness and isolation	4%	10%
Workshops not well suited for online classes	0%	4%

Note. The results do not add up to 100% because the students were not limited to one answer.

Source: authors' own work.

Table 9
Students' answers to the question: What could make it easier for you to study online?

Factors that facilitate studying online	% respondents*	
	UManresa (Spain)	WUT BS (Poland)
Good Internet connection and no technical problems	24%	2%
No noise at home	16%	0%
Theoretical classes online, while practical classes face-to-face (blended formula)	16%	0%
Better organisation of teamwork	12%	0%
More didactic activities for students	10%	0%
More practical activities and less theory	8%	0%
More interaction and more discussions	0%	8%
Fewer didactic activities for students (tasks, exercises, projects, studies, etc.)	6%	0%
Online learning guides or tips	6%	0%
Recording classes	0%	6%
No minimum grade to pass the course	4%	0%
Division into groups	0%	4%
More frequent breaks	0%	4%

Note. The results do not add up to 100% because the students were not limited to one answer.
Source: authors' own work.

tion between the lecturer and students as well as the students themselves, which would be facilitated by switching on the cameras by students; even more discussions, better organisation of teamwork, more frequent breaks, shorter class duration, and lecturer support by involving extra support during online lessons to assist them in technical aspects. A few of the students also suggested more one-to-one and fewer group activities.

On the other hand Spanish students suggested, among other things, introducing more practical activities (tasks, exercises, projects), getting rid of a minimum grade for passing the course, and supporting students by developing a digital learning guide by the university, which would facilitate studying in a virtual learning environment. In their opinion it would be a good solution if, ultimately, theory was taught online and practical exercises were delivered in the classroom. It was suggested that the University develop a digital learning guide that would facilitate studying in a virtual environment. Spanish students also indicated other factors that could improve the quality of digital learning, which were not dependent on the university, such as better internet connection and no noise at home.

Discussion and conclusions

The main objective of the study was to identify the factors of satisfaction of Polish and Spanish students with e-learning during the COVID-19 pandemic and identify the similarities and differences in their assessments, and then compare the obtained results to determine the main determinants of student satisfaction with this form of education and activities that student feedback should be taken by universities to improve the quality of e-learning in the future.

In order to achieve the above-mentioned aim of the study, it was necessary to answer the following research questions:

1. What was the level of Polish and Spanish student satisfaction with e-learning during the COVID-19 pandemic?
   In the case of Poland and Spain, students' satisfaction was at a similar level, meaning that both groups of the surveyed students were satisfied with e-learning during the COVID-19 pandemic. However, the transition from traditional to online education during the pandemic has challenged many universities. Not all of them managed to cope with this challenge and 'somehow' conducted online classes, forgetting that their 'quality' guaranteed students' satisfaction with this form of education. In the countries where the quality of e-learning was low student satisfaction was also low (e.g., Indonesia or Afghanistan). In contrast, in countries where the quality of this form of education was given considerable attention, the level of student satisfaction was much higher (China, Italy, Portugal).

2. Which factors determined the level of satisfaction of Polish and Spanish students with e-learning? Did both groups of students indicate the same factors?
   Student satisfaction with e-learning is the feeling of pleasant or unpleasant learning in a virtual environment, which depends on many factors. According to Polish and Spanish students, the satisfactory factors in e-learning related to teaching materials placed on the platform, good quality of the e-learning and communication platform, organisation of e-learning, and support provided by the universities and lecturers. A large group of Spanish students was satisfied with the practical activities (tasks, exercises, discussions, and other). In the case of Polish students from WUT BS, this aspect was not mentioned. Spanish students were also satisfied with the online classes, particularly with the possibility of recording them and uploading them to the platform. In contrast a small group of Polish students noted the benefits of recording lessons and the possibility of playing them anywhere and anytime.
   The factors reducing the satisfaction level of Polish and Spanish students were noises at home and the lack of personal contact with lecturers and other students. In the case of Polish students an additional challenge was performing team tasks. Low dynamic online classes, which made the perception of classes too long and tiring, was another unsatisfactory factor in e-learning during the pandemic for both groups of students. For a large group of UManresa students, the free Internet connection was a reasonably significant obstacle in implementing online classes. In contrast, only a few WUT BS students complained about problems with the Internet. Some students from the Spanish university were dissatisfied with online exams, which cuased them additional stress, while Polish students did not mention it.

3. Were the differences in the levels of education a factor differentiating the assessment of the degree of student satisfaction?
   In the case of the surveyed Polish and Spanish students, their satisfaction with e-learning was very similar despite the differences in the level of education (diploma and master's studies), which allows us to assume that the level of studies did not directly affect the level of satisfaction of students with online education. Nevertheless, in some aspects, the level of satisfaction of Polish students (postgraduate studies) slightly differed from the level of satisfaction of Spanish students (diploma studies), such as the organisation of online classes or the amount of teaching materials (Polish students were more satisfied with the organisation than their Spanish colleagues, Spanish undergraduate students

were more satisfied with the amount of teaching materials than postgraduate students from Poland). Due to the limited study period, it has not been established whether these differences were due to the level of education or due to other factors. More research is needed in this area in order to find out.

4. What actions, in the opinion of the surveyed students, should be taken by universities to improve the degree of students' satisfaction with e-learning in the future, and thus its quality? Were the activities proposed by both groups of students the same?

Regarding students' suggestions to improve e-learning, the only similarity is that both Polish and Spanish students believe that some classes should be conducted online and some face-to-face. For Polish students a good solution would also be online broadcasting of face-to-face classes. Other improvements proposed by Polish students are: increasing interaction between the lecturers and students, and also among the students themselves, more discussions, better organisation of teamwork, more frequent breaks, shorter duration of classes, and lecturer support by involving an additional person during online classes.

On the other hand Spanish students suggested introducing more practical activities (tasks, exercises, projects), getting rid of a minimum grade for passing the subject, and supporting students by developing an e-learning guide by the university, which would facilitate studying in a virtual learning environment.

At this point it should be added that the students' demands have been presented to the university authorities, and their improvement proposals are successively being implemented, as both surveyed universities still conduct some classes in the e-learning formula and want the students' satisfaction with these classes to be at the highest level.

5. What were the advantages and disadvantages of e-learning during the pandemic in the opinion of the surveyed students?

Both groups of surveyed students recognised that in the case of e-learning there was no necessity for them to commute to the university to save time and money, also making learning more flexible and convenient. This is also confirmed by the results of the studies conducted, among others, by Grace College (n.d.), according to which the main advantages of e-learning during the pandemic were the saving of time on commuting to the university and the possibility of studying in comfortable conditions and flexibility.

Permanent access to didactic materials on the platform is another advantage of e-learning

indicated by Polish and Spanish students. At this point it should be emphasised that in e-learning, besides enriching knowledge, didactic materials serve as orientation functions for learning, assessment, and self-assessment; they promote self-education and influence the quality of the entire teaching process (Marciniak & Cáliz, 2021).

It is also worth mentioning that the students emphasised that e-learning mobilised them to manage their time better and organise their work. As the Spanish Virtual University UNIR (2020) points out, e-learning requires more discipline and efficiency on the part of the student, so planning is the key to the right work rhythm.

In the case of e-learning disadvantages that could be influenced by the university, especially Polish students mentioned no personal contact with the lecturer or other students. These disadvantages of e-learning are also indicated by Warchala (2020), who claims that online learning is convenient but will never replace face-to-face contact with a lecturer.

Another disadvantage of e-learning, according to postgraduate students in particular, is the inability to build relationships with other students. Networking is a crucial factor, and the lack of personal contact with others during classes or during breaks, where students often exchange their opinions, is a weak point of e-learning. Moreover, according to World Bank experts (World Bank, 2021) "staying at home is also affecting students' physical, mental and emotional health, as well as their vulnerability to engage in risk behaviours" (p. 43).

Additional conclusions regarding the factors determining student satisfaction with e-learning during the pandemic

The factors determining satisfaction with e-learning during the pandemic indicated by Polish and Spanish students are consistent with those indicated by other authors (AENOR, 2012; Hettiarachchi et al., 2021; Hashemi, 2021; Keržič et al., 2021; Online Learning Consortium, n.d.; Prodanović and Gavranović, 2021; Saeid & Eslaminejad, 2017; She et al., 2021; Surahman & Sulthoni, 2020) and with students from other countries described in this paper. These factors can be divided into two groups: university-dependent and university-independent ones.

Factors dependent on the university include:
• the profile and attitude of lecturers (lecturers' preparation and involvement, their digital and didactic competencies in the field of e-learning, providing feedback and support to students),
• quality of technical infrastructure (e-learning platform, application of online learning support programmes),

- interaction (on the student-lecturer, student-student, and student-course content level),
- organisation of e-learning (including the organisation of human resources – lecturers with an appropriate profile, organisation of teaching resources – access to various, high-quality teaching materials adapted to the virtual learning environment, organisation of technological resources – selection of an appropriate e-learning and communication platform for conducting synchronous classes).

Factors independent of the university include:

- the student's home conditions (lack of noise, which helps to maintain concentration for a long time)
- the student's technical infrastructure (good internet connection, personal computer)
- self-efficacy and behavioural, emotional, and cognitive student engagement.

Limitations and areas for future research

The research carried out is unique, because so far no one has conducted comparative studies on students of Spanish and Polish universities in the context of their perception of e-learning. However, a major limitation of the study was the poor return rate of completed surveys by Spanish students. Although the sample was not large, it was sufficiently sizable to draw some conclusions. Moreover, the study was limited to only two countries. Future research should be extended to other European countries to broaden the current research scope, as literature is dominated by e-learning satisfaction surveys conducted in Asian countries during the pandemic. Another limitation of the study was its focus on understanding the degree of satisfaction of students who, together with lecturers, were the main players in the transition from offline to online education during the pandemic. Therefore, it is advisable to get to know the opinions of Polish and Spanish lecturers on the advantages and disadvantages of e-learning and their degree of satisfaction with this form of education, as well as transcend the obtained results with the results of student satisfaction in order to establish differences and similarities in their opinions. Another recommended line of research is an in-depth study of differences in the satisfaction of students of different levels of education (Bachelor's, Master's, and PhD) with e-learning during the pandemic period to determine whether these differences are due to the level of their studies or not.

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Renata Marciniak holds a Ph.D. in Education from the Autonomous University of Barcelona (UAB), as well as a Ph.D. in Economics and Management from the University of Economics in Cracow (Poland). She is a professor accredited by The National Agency for Quality Assessment and Accreditation of Higher Education of Spain (ANECA) and by Catalan University Quality Assurance Agency (AQU Catalunya). She is also a professor at the Universitat de Vic – Universitat Central de Catalunya, Campus Manresa, Barcelona and at the Euncet University Business School in Terrassa (Spain). She is the author of several books about management and e-learning, and she has published a number of articles in high-impact journals (including JCR – Journal Citation Reports) about the understanding of the quality of digital learning. She is also the co-author of Polish Standards for Online Learning Services. She participated as a keynote speaker in several international congresses and conferences and several international research projects related to digital learning, and is a member of scientific international associations and organisations. Her research interests include management in digital education, e-learning standards, and the quality of digital higher education.

Grażyna Rembielak is a Full-time Professor in Marketing at Warsaw University of Technology Business School and the Director of the Quality and Development Department, EMBA and MBA Programmes Director, and Total Design Management Programme Director at Warsaw University of Technology Business School. She obtained a Doctorate in Economics from Warsaw University of Life Sciences – SGGW. Her professional experience lies in the area of Marketing and Management and International Business, and she has extensive experience in University Programmes design and development, management, educational quality assurance, and improvement. She also boasts experience in leading and taking part in accreditation teams for national and global accreditations, and an internal system of quality assurance and development. She is also an active researcher taking part in internal and external (national and international) research bids, which is reflected in several publications and conference participation in highly ranked international conferences in European countries, as well as in the USA, mainly in the field of Marketing, including Services Marketing in public and non-public Higher Education institutions, quality systems in Higher Education; Consumer Behaviour: consumer expectations, perceptions, motivations, and satisfaction in the case of global Higher Education, as well as developing and maintaining the high quality of programmes taught.