Needs and expectations of university students: Learning from the impact of Covid-19 upon 9 Spanish universities

Abel García-González
Tecnologico de Monterrey, Mexico
Inmaculada Aznar-Diaz
University of Granada, Spain
María Soledad Ramírez-Montoya
Tecnologico de Monterrey, Mexico
José María Romero-Rodríguez
University of Granada, Spain

This research studied the needs of university students receiving distance and hybrid education during the Covid-19 pandemic. The study's main objective was to analyse the university students' expectations and needs in the Andalusia (Spain) region during the Covid-19 health emergency, to provide guidelines for post-Covid online and hybrid educational continuity. A qualitative interpretative study was carried out on the survey responses of 641 undergraduate and postgraduate students in nine Andalusian universities. Six themes related to the students' needs and expectations came from the findings. The needs and expectations of students during a health emergency like the Covid-19 pandemic depend on university management developing and implementing a clear plan of action, continually communicating with students, training teachers in the virtual and hybrid modalities, and building and maintaining empathetic relationships in the university community.

Introduction

One year after the migration to distance education due to the Covid-19 health emergency, universities are challenged to understand how to approach student learning in emergencies that might arise in future years. It became necessary to analyse the effects of the present emergency on students to generate guidelines to address the emotional and social problems that affect their performance (Fernandes, 2020). Studies indicate that social isolation caused by the forced shift to virtual education brought anxiety, stress, uncertainty, depression and demotivation that affected students' academic performance and their experiences as professionals-in-training (Husky et al., 2020).

Covid-19 affected at least 890 million students in 114 countries. There is still uncertainty about how long the pandemic effects will last (de Oliveira-Araújo et al., 2020). In addition to the impact of the changed educational model, the effects of the economic crises of many families and concerns about contagion and death of family members need to be assessed (Karpman et al., 2020). Thus, the administrators, faculty and students of the university community have been faced with the challenge of decision-making amid uncertainty about what will happen next (Garcia-Penalvo et al., 2020).

Distance education through information and communication technologies (ICT) is not a new topic in the higher education sector. The value of the flexibility offered by online

programs has been recognised (Rodriguez & Gallardo, 2017). Over the last few years, research has examined various virtual education terms and modalities (online teaching, remote teaching, distance learning, for example) to consider the added value they bring to education (Carrillo & Flores, 2020, p. 3). Curricular design requires extended time for development, research and evaluation. However, the pandemic forced immediate changes, especially teaching practical content, such as required for medical education (Longhurst et al., 2020). Therefore, it has become necessary to conduct further research into Covid-19's impact on university education.

On the other hand, the health crisis accelerated the changes that educational systems had been predicting for years (Bokova, 2014; Robinson, 2011). These anticipated changes include preparing students for continuous changes and sustainability, enabling them to solve complex problems, changing the teacher's role to a facilitator, teaching life skills such as innovation, creativity, resilience, autonomy, adaptability, communication, collaboration, empathy, and emotional intelligence, and implementing new technologies in educational processes (Dietrich et al., 2020). In addition, Covid-19's confinement reinforced the need to attend to mental disorders among university students, which is usually carried out through student counselling departments, comprehensive care units, and others. Therefore, it is also important to develop online program to address students' needs (Rodríguez-Rivas et al., 2021).

It has been reported (Hidayati & Saputra, 2020) that students agreed with distance learning during the onset of the pandemic because it avoids barriers of time and distance. However, many were anxious, especially those who live in remote communities or were impacted healthwise or economically. They connected at different times of the day, but most indicated dissatisfaction with not having a learning track and still having to complete assignments (Hidayati & Saputra, 2020). Other studies indicate that students have been more resilient than expected (Lee et al., 2021) and have not expressed computer anxiety (Cicha et al., 2021). Such statements need to consider the context of the students and the actions implemented by the institutions, as the students' experience might depend on the way their university's management conducts it.

Therefore, this study aims to provide decision-making knowledge for new university courses that incorporates the experiences and concerns of students who have undertaken their education during the health crisis (Hargitai et al., 2021). It is hoped that such studies will help the implementation of new educational modalities in the future (Kulikowski et al., 2021) that promote student satisfaction (Ismaili, 2021). This research emerges from reflection and pedagogical knowledge development (Carrillo & Flores, 2020) and digital strategies (Llerena-Izquierdo et al., 2020) that address students' perceived needs (Marek et al., 2021) in all curricula, disciplines, and degree programs of the university (Cicha et al., 2021; Ela et al., 2021).

The specific objective of this research was to analyse the university students' expectations and needs in the Andalusia (Spain) region during the Covid-19 health emergency to provide guidelines for educational continuity in future academic years. The study analysed the students' experiences from the beginning of the confinement, March 2020, until

October 2020. These experiences were analysed qualitatively under a theoretical framework that addresses the effects of the Covid-19 pandemic on academic performance and the socio-emotional and economic impact. The process of analysis and synthesis of the information led to answering the research objective through a general problem structure that contemplates the needs and expectations of the learning experience in the context of an emergency.

Theoretical framework

Academic performance impacted by Covid-19

The migration to distance education demanded learning management systems (LMS) or virtual platforms that provide the educational continuity of students' teaching and learning processes (Romero-Rodriguez et al., 2020). In this context, educational services must consider that the LMS facilitates acceptance of the technology and learner satisfaction since a satisfactory experience with the platform can result in learning successes (Al-Nuaimi, 2021; Ismaili, 2021). It is also important to provide learning resources appropriate to the learning objectives, for example, open educational resources (OER), open educational practices (OEP), and the implementation and development of mobile learning practices (Huang et al., 2020; Romero-Rodríguez et al., 2020). Some studies suggest that virtual platforms for tutoring university students are here to stay and have a satisfactory outcome on student performance (Cao et al., 2021).

Despite efforts to ensure continuity of educational services, several studies have reported the negative impact of Covid-19 on learning. Problems increase when students do not have the necessary equipment, such as a stable power supply and good Internet connectivity, the cost of which can be very high in certain regions (Armoed, 2021). In some areas, the distress experienced by students is mainly due to the scarcity of means for online education, or technological ignorance (Mirza et al., 2021). It is evident that even if the university implements virtual strategies and platforms appropriately, the resources available to students influence their academic achievement.

Contextual and social factors are only part of some of the complications during an emergency. In regions where universities have highly developed educational technology, problems have included the lack of time to prepare courses, social isolation, and the need to find pedagogical approaches that continue to motivate students (Huang et al., 2020). Forced online learning implementation negatively affected both teachers and learners (Kulikowski et al., 2021). Thus, research has been conducted to support decision-making in crises. Vicario-Solórzano & Huerta-Cuervo (2021) proposed a model for the continuity of educational services in an emergency being composed of three dimensions: (1) academic; (2) organisational; and (3) technological (Spais & Paul, 2021).

In this regard, social integration has been a recurring theme in studies of educational problems caused by confinement and lack of people contact. Jowsey et al. (2020) pointed out the importance of designing communication strategies between student-student and student-teacher with a clear work structure that avoids saturation of activities or content.

From this perspective, technology-based learning could adopt a collaborative approach involving additional stakeholders (Mirza et al., 2021). It is necessary to establish an empathic connection between the community (Mirza et al., 2021) and students to avoid dehumanisation, rupture of social bonds, loss of status as a learner and decreased quality of education (Noskova et al., 2021).

As the restrictions of face-to-face classes in various contexts continues, social media can strengthen the sense of community among students. Appropriate use of social media can help promote a new era of social learning as an alternative platform to foster online learning and create community among students and teachers by encouraging discussion and interaction (Carrillo & Flores, 2020; Sobaih et al., 2020). Virtual interactions and online learning could positively affect digital citizenship behaviours (Akcil & Bastas, 2021). Therefore, it is always important to consider management aspects to avoid burnout due to constant communication with learners to resolve concerns and questions. During the current crisis, the instructional design of distance education had to consider the social, cognitive and emotional issues (Okada & Sheehy, 2020). It is essential to provide opportunities for students to take advantage of and explore different learning tools (Cicha et al., 2021) that can be used to analyse how they cope with isolation, their study performance, possible inequalities, and their perception of online classes (Ela et al., 2021; Kalloo et al., 2020).

On the other hand, the university administration must consider that acceptance and satisfaction in learning may vary among theoretical subjects, practical subjects, and various disciplinary areas (Barrera et al., 2020). Similarly, learning assessment processes should be diversified according to the online or hybrid learning environment (Ismaili, 2021).

Socio-economic impact of Covid-19 on students

The sudden change in the lives of students and university communities as a result of Covid-19 also brought mental health problems. Factors affecting emotions, such as stress, depression, anxiety, and fear, occurred for students (Ela et al., 2021) and teachers (Denisova et al., 2020). From the start of the pandemic, institutions implemented rapid online training for teachers to develop their digital competencies to know, explore and use various digital platforms and resources. This favours remote teaching and open spaces to discuss and deal with collateral emotional damage (Llerena-Izquierdo et al., 2020). However, the emergency and the constant uncertainty brought about the emotional issues discussed above.

Although the lockdown occurred worldwide, the particular situations in each locality and state contributed to better or worse outcomes. The lockdown caused mental distress such as fear among students, especially in developing countries that also deal with poverty (Mirza et al., 2021). It also caused fear among students in practical disciplines such as healthcare, where health students lived in constant fear of infecting their families during their internships (Deora et al., 2020). Similarly, fear was present in learning areas traditionally more difficult, such as mathematics (Mendoza et al., 2021). On the other

hand, fear of failure also existed among those taking demanding, experiential learning courses, for example, laboratory practices.

Another emotional impact was the high rate of anxiety among the students. As mentioned, the anxiety commonly presented in teaching and learning mathematics increased in the face of the move to remote education (Mendoza et al., 2021). Another cause had to do with the academic future and the influence on their professional careers (Ela et al., 2021), which produced anxiety about their future employment. Online test anxiety has also been a problem. Arora et al. (2021) argued that test anxiety exceeds the pandemic anxiety, so strategies and actions must be implemented to minimise it (Akcil & Bastas, 2021).

Undoubtedly, the experience of universities during the first stage of confinement will be helpful for subsequent courses, as the ravages of the pandemic require attention to the emotional state of the student body. Although mobility restrictions are beginning to ease in many regions, it is necessary to develop online courses in the best way to avoid further episodes of stress (Prilutskaya & Grjibovski, 2020) and implement early attention to emotional problems. Dietrich et al. (2020) shared some lessons for the uncertain future of universities: (1) address ethics and purpose in student assessments; (2) provide adequate and systematic attention to students' mental-psychological health (Al-Nuaimi, 2021); (3) break the monotony of distance education through motivation, gamification, and restoring the pleasure of learning; (4) assist students who do not have the necessary infrastructure for online education (Prilutskaya & Grjibovski, 2020); (5) work with international students, who are more isolated and less equipped; (6) pay attention to teachers' equipment at home and work-life balance; and (7) provide diverse resources and support for both students and teachers.

Method

The qualitative interpretive approach (Merriam & Tisdell, 2016) in this research aimed to generate a theoretical explanation of how participants interpreted their distance education experience and the effects of the pandemic. We performed inductive analysis to derive the assumptions from the students' responses (Atkins & Wallace, 2015; Vela, 2001).

The study was conducted under a main project titled 'Socio-economic impact of Covid-19 in Andalusian university students', having objectives (1) to evaluate the social impact of the psychosocial variables that affected university students during the lockdown; (2) to evaluate the impact of Covid-19 in the lives of students; (3) determine the influence of psychosocial and economic variables on academic performance; (4) to know the expectations and needs of university students regarding the following academic courses; and (5) design and develop a contingency plan for subsequent courses in Andalusian universities.

For this, six surveys were applied within a single instrument to a convenience sample, investigating psychosocial, academic and economic variables. To measure fear of Covid-

19, the *Fear of Covid-19 Scale* (Ahorsu et al., 2020), adapted to the Spanish language by Huarcaya-Victoria et al. (2020) was applied; the *Satisfaction with Life Scale* (SWLS) was also applied (Diener et al., 2010) , which was validated in the Spanish context (Atienza et al., 2000); to measure uncertainty the *Scale of Intolerance to Uncertainty-12* (IUS-12) (Freeston et al., 1994), validated in the Spanish context (González et al., 2006) was implemented; and to measure depression and stress the *Depression Anxiety and Stress Scale-21* (DASS-21) (Antony et al., 1998) adapted to the Spanish language by Fonseca-Pedrero et al., 2010). In the same way, scales were implemented to explore the academic variable, for which the *Motivated Strategies for Learning Questionnaire-Short Form* (MSLQ-SF) (Pintrich et al., 1993), Spanish version scale (Tinoco et al., 2011), was administered, as well as the facilitating conditions dimension of the *Unified Theory of Acceptance and Use of Technology* model (UTAUT) to indicate aspects of human, organisational and technical support to use the technology (Venkatesh et al., 2003) adapted in the context of the Spanish language by (Martín-García et al., 2014).

Participant responses to the open ended question described below and administered in Spanish were translated into English by the authors as required for quotation purposes. This process was reviewed and approved by the authors.

At the end of the instrument, the students answered the open question item: "What expectations and needs do you have for the next academic year 2020/2021 at your university?". The instrument was administered to the students through a *Google Form*, whose link was sent by email to the students of the participating universities. This research's objective corresponds to the objective (4) of the main project: to analyse the university students' expectations and needs in the Andalusia (Spain) region during the Covid-19 health emergency, to provide guidelines for educational continuity in future academic years, which is the focus of this research paper.

Participants and data collection

Six hundred and forty-one students' responses (n=157 males; n=484 females) from nine Andalusian universities were analysed: University of Almería (n=4), University of Córdoba (n=30), University of Granada (n=547), University of Huelva (n=2), University of Jaén (n=19), University of Málaga (n=8), University of Sevilla (n=7), University Loyola de Andalucía (n=19), and University Pablo de Olavide (n=5). Participants were from undergraduate programs (n=556) between 18 and 45 years old, and postgraduate programs (n=85) between 22 and 59. Data were obtained from a questionnaire with an open-ended item on students' expectations and needs in education during the pandemic.

Data analysis

The analysis followed a reflective process of coding and categorising the responses and identifying themes describing and explaining the students' needs and expectations, thus, generating a comprehensive explanation of the study phenomenon shaped by the perceptions of a large number of participants (Creswell & Poth, 2018). Structural coding was employed, suitable for studies with multiple participants and standardised protocols

for data collection (Elo et al., 2014; Saldaña, 2010). The data analysis process for qualitative content was as follows:

- Preparation and pre-analysis: initial reading of responses; thorough identification analysis for open coding in the content body (San Martín-Cantero, 2014).
- Definition of units of analysis: rereading the notes and open coding.
- Generation of axial coding based on representative attributes of the data, inference in theory and inductive reflective process (Scott & Medaugh, 2017).
- Definition of categories and themes (Merriam & Tisdell, 2016; Moghaddam, 2006).
- Final synthesis: general representation of the study phenomenon and its relationships.

Findings

The analysis of responses allowed identifying and modelling the needs and expectations of the students. The axial coding process generated three themes related to needs in the learning experience: (1) effective learning; (2) teaching; and (3) emotional state; and three themes related to expectations in the learning experience: (4) continuity of educational services; (5) technological infrastructure; and (6) optimism. The needs and expectations analysed represent the students' feelings, expressing the emotional problems caused by confinement during the health emergency and its impact on their professional training.

The needs highlight the demand for learning processes adapted to the remote education and health situation. It is directly concerned with how teaching is conducted considering the learners' emotional states (Figure 1). Theme (1), effective learning, emerges mainly from the perception of virtual work overload and failure to achieve effective learning, leading to a desire to return to face-to-face classes. ("I hope it will be a mostly face-to-face course, and, if not, I hope the university will be flexible and understanding with the students in this difficult situation for all of us") (P37). This correlates with Theme (2), teaching, as the learning experience depends mainly on teacher training and involvement:

> With the confinement, things have been done as we have been able to see. However, now that we know how to act, I believe there will still be teachers who do not know how to use the resources, others who do not get involved, and the majority who demand more than what they have offered or provided in terms of materials for the students (P50).

In addition to these needs, there is concern about Theme (3), emotional state, which emerged from explicit statements related to stress, depression, anxiety, demotivation and fear of contagion:

> I disagree with blended learning classes. I don't think that going to the faculty every 'x' weeks, putting the health of students and teachers at risk, provides a greater benefit than the risk because, with five days of classes, I don't think it will make it easier for the student to study (P106).
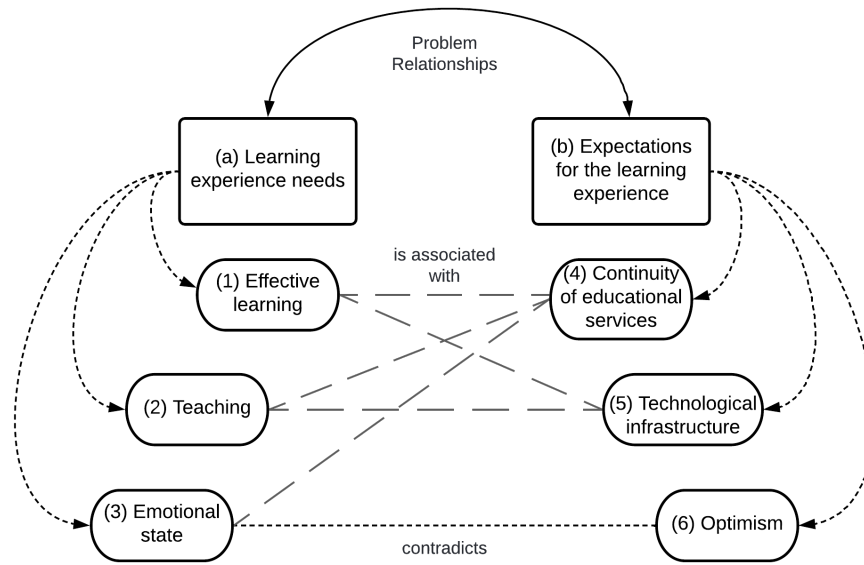
Figure 1: General structure of the problem

Some opinions are contradictory, with some preferring to return to classes due to learning difficulties and episodes of stress, anxiety and demotivation, while other students feared the growth of Covid-19 positive cases.

The (b) expectations regarding the learning experience are composed of Themes (4), continuity of educational services, and (5) technological infrastructure, both related to Themes 1, 2 and 3. Similarly, codes related to Theme (6), an optimistic future perspective, emerged, which could oppose Theme (3), emotional state. On the side of (4), continuity of educational services, straightforward management and planning by the university were identified as one of the highest expectations:

> I expect coordination (...) in how teaching and assessment methods should be adopted (...) and clear guidelines, not mere recommendations, that will allow decreasing the impact of the present situation on the student body (P76).

The above is related to the conditions of (5), technological infrastructure, since students expect to have support, flexibility and understanding regarding their online teaching limitations, such as the technological equipment available to students: "The problems with the Internet connection - I won't be able to solve them because it is not under my control" (P477).

In other words, this issue considers the technological equipment of the university platform itself, the unequal contexts, and the need to make processes more flexible. Despite these problems, Theme (6), optimism, emerged. While acknowledging the

problems and difficulties generated by the pandemic, this theme highlights resilient positions, for example, making an effort to adapt to remote teaching to mitigate the pandemic [about their expectations in teaching]: "Regarding online teaching during the pandemic, lives are at stake" (P367).

The results for each of the themes that emerged in the analysis are presented here.

Theme 1: Effective learning

The need for effective learning was the theme with the highest number of codes and density in correlations. Figures 2-7 represent each theme. The diagrams were obtained from *Atlas.ti* software (https://atlasti.com). Each box represents a code, and two numbers are presented in square brackets. The first number corresponds to the foundation of the code, that is, the number of citations related to that code found in the students' responses. The second number refers to the density, the number of relationships with other codes, which are presented with black arrows. Figure 2 shows the codes and their relationships. The perception of the ineffectiveness of online classes has the highest density related to the need for adequate learning resources and difficulties in self-management of learning.

Several aspects affect this perception: attention to students with special educational needs, uncertainty about the future of work, the need for community and university coexistence, space for leisure, and the feeling of privacy invasion. Also, students prefer to carry out technical and practical classes in a face-to-face manner. The latter was repeated in the code "back to total in-person classes," which makes sense given the requirement for access to educational services, such as laboratories or libraries. "All degrees are not the same; in some, the laboratory practices or other practical activities essential for training predominate" (P67).

In general, the codes with the most substantial support for effective learning were related to learning difficulties due to the need for physical presence (for example, working in laboratories, studying in libraries) and related to the perception of virtual work overload, which can trigger depression and demotivation: "Despite having all the economic and virtual facilities for online work, it is demotivating to be 24 hours a day in the same space for practically everything" (P626).

Even though some opinions do support the acquisition of online learning, there is still concern about not learning everything necessary: "Because online teaching can be very comfortable in some aspects, but, in reality, the relationship with others and the personal and face-to-face learning is what makes us learn everything" (P373).

Theme 2: Teaching

Theme (2), teaching, is directly related to the previous one. The perception of learning achieved may improve as more learning-focused teaching, empathy, and engagement are developed (Figure 3). The code with the highest substantiation and density corresponds to teacher training and monitoring ICT, which improves instructional design, focus on
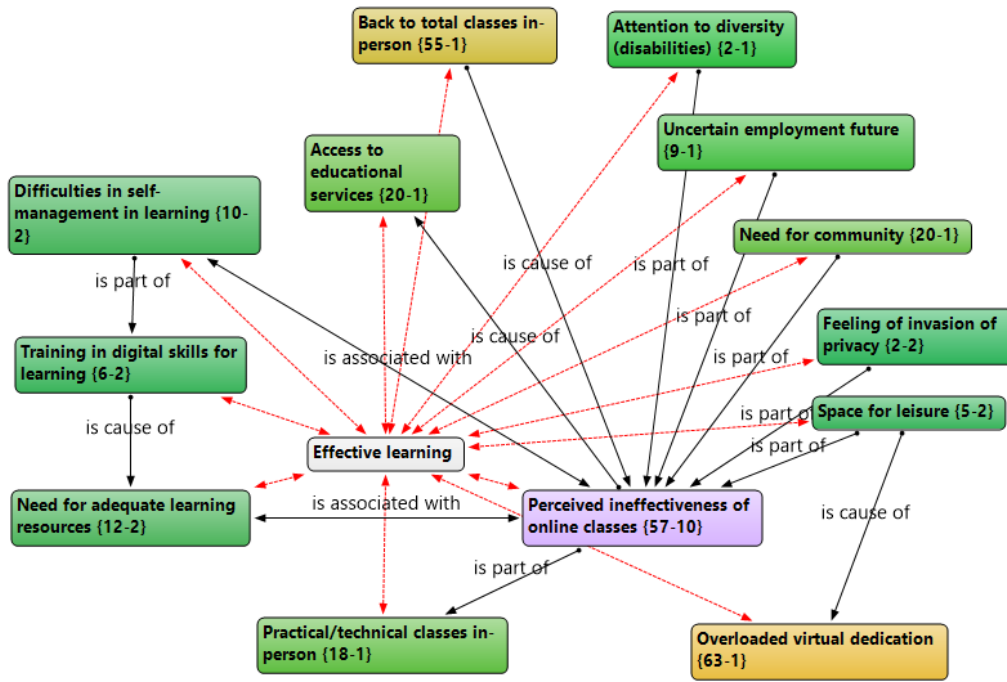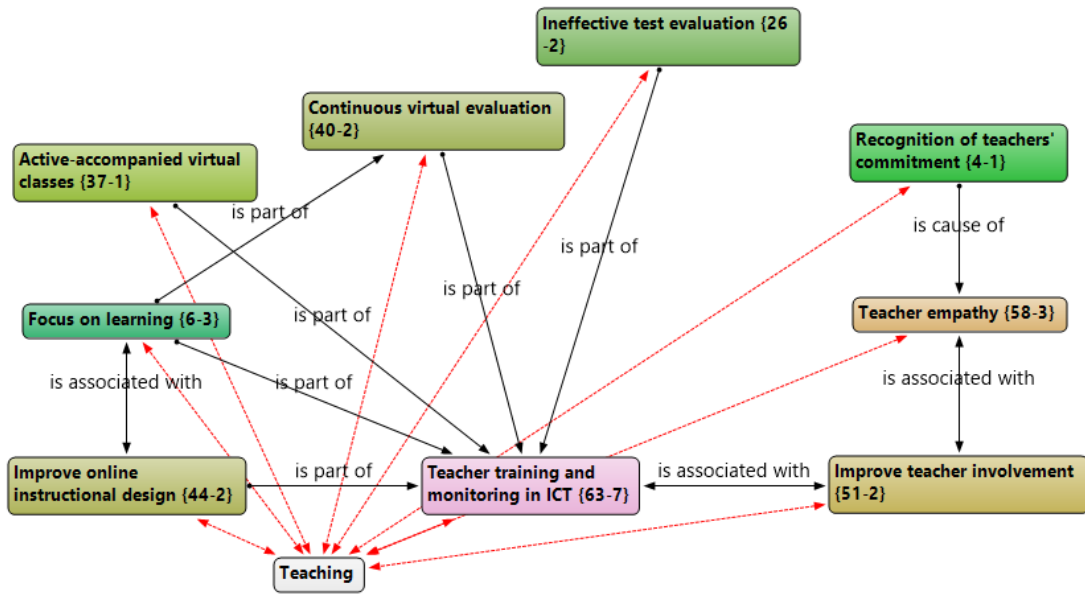
Figure 2: Effective learning

Figure 3: Effective teaching

learning, continuous assessment, perceived ineffectiveness of applying tests, and the need for more teacher accompaniment in the student process.

Thus, students expect teachers to be aligned with the online model beyond requesting assignments and activities. They should have synchronous contact with students, provide explanations to their questions, and conduct active online sessions, motivating learning. "I believe that some teachers need to adapt and improve virtual classes because, in my case, some have not given a single class. They have simply uploaded the material to the platform" (P15).

The above is associated with improving the empathy of the teaching staff and university administration to the problems of contingency: "On the part of the student body, both last year and this year, we felt completely abandoned. Out of five teachers, only one was interested in our mental health and understood our worries and stress during the course" (P469).

On the other hand, the focus on learning code indicated saturation regarding the need for continuous assessment and improving the instructional design of the classes "to ensure that students have an assessment beyond doing theoretical work every week" (P425). This code also highlights the importance of not relying on exams (virtual or face-to-face):

> I hope that (...) they improve the organisation and the contents. The evaluation should be adapted to the type of teaching that is being given. Face-to-face teaching is not the same as virtual teaching, and, therefore, the way of evaluating should not be the same either. (P291)

Many of these expressions concern the recognition that students gave to the way classes were conducted by some teachers, making an argument for a more positive online training experience: "Without doubt, if the situation has not ended up being catastrophic (...), it has been (...) thanks to (...) some teachers who, within their limited power, have tried to make the best of the experience" (P535). A large number of perceptions of a positive learning experience has related to the teacher accompaniment during the crisis: "And it is clear that there are teachers who have been exaggeratedly involved, even offering personal help, and that has helped a lot" (P388).

Theme 3: Emotional state

The theme of emotional state (Figure 4) focuses on the mental health support code. This code emerged from comments explicitly stating the need for psychological support, for example, to cope with the death of loved ones: "I think we would need psychologists in universities to help us cope with this new life due to losses caused by the coronavirus" (P428). Another example is to overcome the stress and anxiety caused by worrying about studies:

> My stress and anxiety levels prevent me from leading a normal life. I do not sleep more than three hours a day. If I had to score from 0 to 10, if this is the fault of my fear of Covid-19, it would be a 0. In the case of my fear of failing as a student because I do not get the resources I need to pass, it is a 9. (P592).
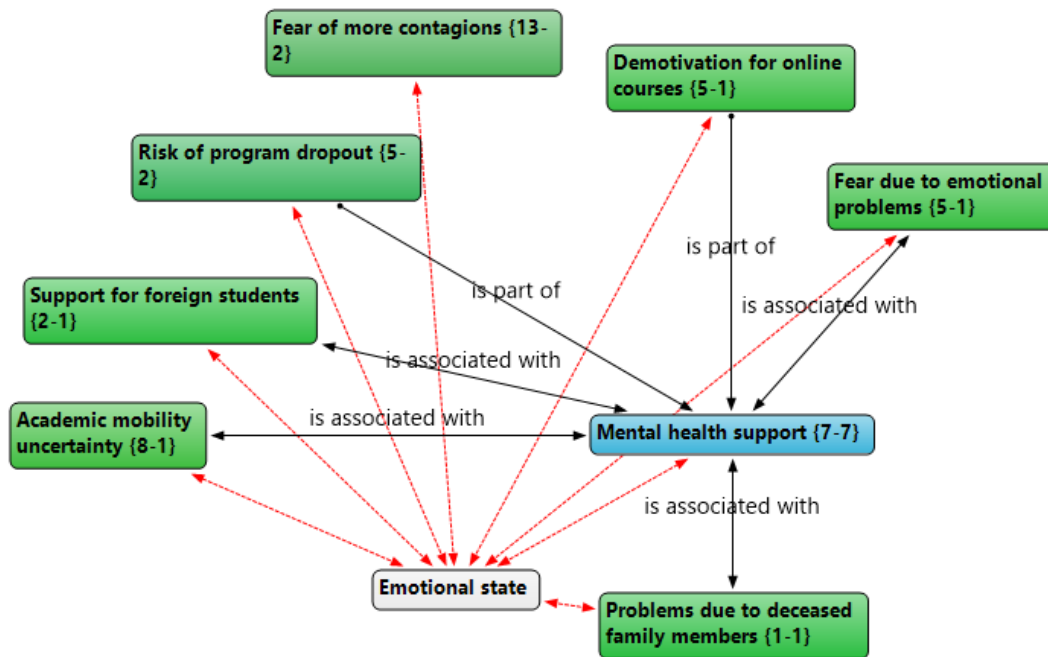
Figure 4: Emotional state

Psychological support for emotional problems correlates uncertainty for those students with academic mobility plans, fear of further contagion, and even fear of starting a new semester with emotional problems with the need for medical intervention to mitigate the effects:

> We have lost time, and we are now required to do the same work but in much less time, which causes much anxiety and stress for many of us, even leading us to seek medical help to control this situation and anxiety, as in my case. (P595).

Theme 4: Continuity of educational services

Theme (4), continuity of educational services, emerged from the problems faced concerning university management. In Figure 5, participants expect clear coordination and planning of university administration (83 quotes). In this respect, prudence and responsibility were expressed for the management of future semesters: "I believe that it is necessary to approach them with optimism, prudence, responsibility and willingness to adapt on all sides, both the university and its staff and students" (P29); and for stability in the decisions: "An academic plan without contradictions or changes every two weeks, i.e. stable planning" (P106).

Participants also stated that they require coordination regarding the blended learning model. "The plan of adaptation to blended learning is very confusing. It is still unknown what will happen when a certain group of students do not go to class because it is not

their turn; will those classes be given online?" (P61) This indicates uncertainty as to what will happen the following semester.
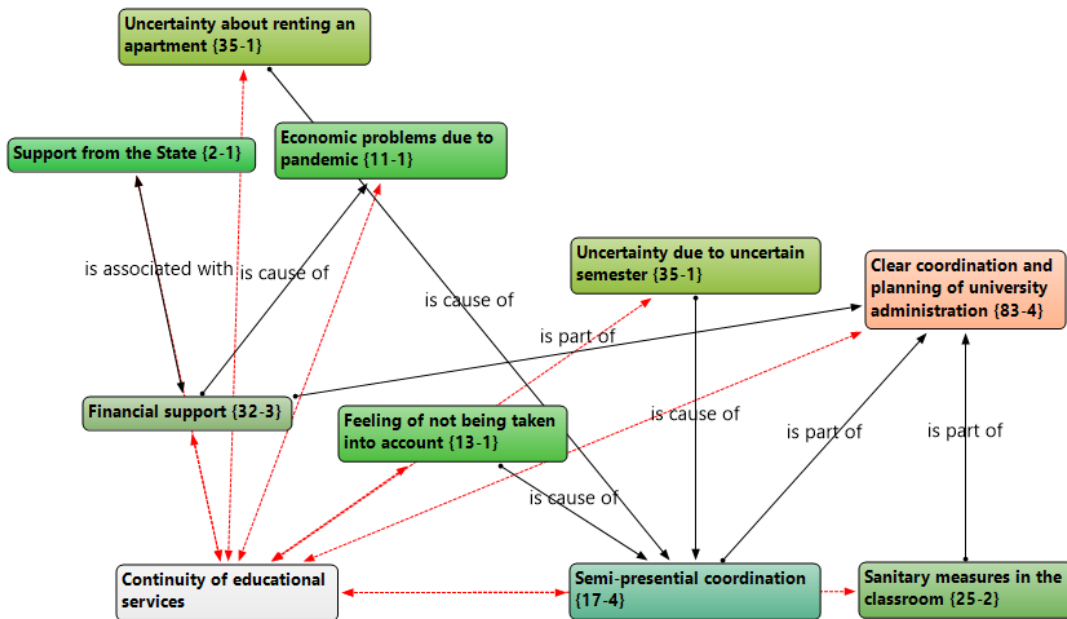

Figure 5: Continuity of educational services

Added to this is the expectation of maximising health measures for face-to-face activities. "I expect strict hygiene and distancing measures to prevent classes from becoming a source of contagion" (P114). Similarly, there is a feeling of not being considered, as they believe they are the most affected by the situation:

> For this, I hope that the University will maintain a dialogue with student representatives and that their recommendations and opinions will be taken into account (...) only we know the difficulties we face. Without our perspective the University is likely to make decisions that disadvantage further those who are disadvantaged (P31).

The students expect the University to coordinate material resources and support them in access to equipment:

> I have financial difficulties. This year I have been using a computer that was left to me, as my mother is unemployed, and we are a single-parent family. So it is difficult for us to buy a computer. It would be gratifying to receive help with this (P206).

Also, there is uncertainty about financial problems for foreign students about renting a flat [expectation regarding online classes]: "To avoid spending money, as I have worked hard to afford a rented flat and I could be doing the online classes at my parents' house" (P287).

Theme 5: Technological infrastructure

Technological infrastructure alludes to the importance of considering students' access and equipment for online classes and the problems of contextual inequalities (Figure 6). Processes related to adapting to the pandemic are expected to be more flexible: "It is also true that not everyone has sufficient technology to be able to teach online (no computers, no Internet, no printers)" (P50).
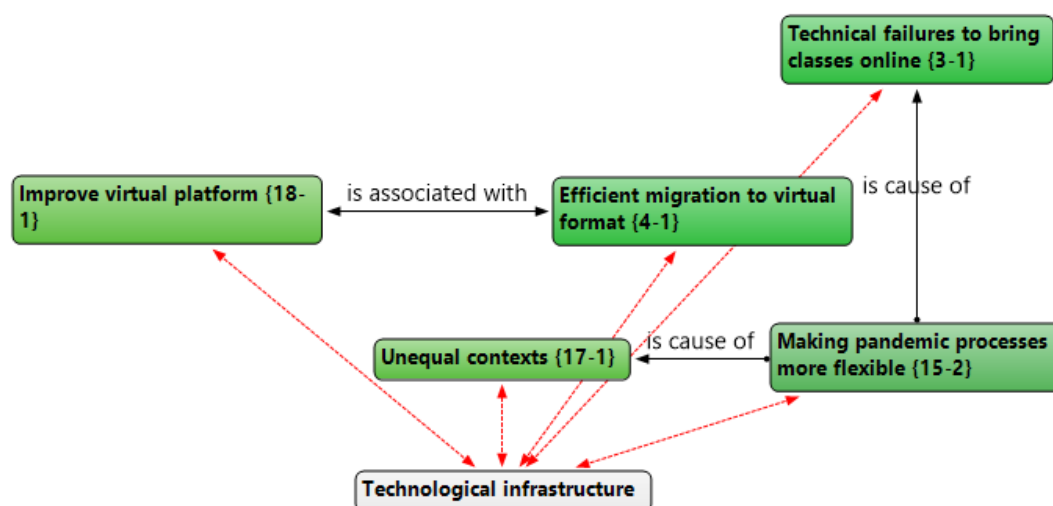

Figure 6: Technological infrastructure

Optimisation of online learning platforms is required: "More attention should be paid to virtual platforms so that when activities are carried out, the page does not hang or crash" (P461). Also demanded is an efficient migration to virtual courses:

> My recommendation is that all the University's resources be focused on the use of Prado [learning management system based on Moodle], that they avoid having to send work to the teachers' emails, as it is much easier for everyone to know that everything will be posted and accessible on the platform (P29).

Beyond the importance of improving the students' technological equipment and e-learning platforms, the code unequal contexts substantiated many responses. In this regard, there was concern about technological problems, such as Internet connections: "The problems with the Internet connection, I won't be able to solve them because it is beyond my control" (P477). "I am constantly worried that it will fail in the middle of a class" (P474). These comments represent the stress and fear of missing details during a lesson or failing an exam.

Theme 6: Optimism

Theme (6), optimism, emerged from responses having resilient attitudes toward the emergency. The most substantiated code (45) in this regard is acceptance of virtual classes

based on the contingency, i.e. some participants accepted that migration to virtual education is necessary. Beyond that, they saw opportunities for the future related to online education: "Classes are going to be mostly virtual to prevent resurgences, and this will encourage more virtual teaching" (P21). There was also a positive expectation due to the accumulated experiences of the first months using this modality: "I think that this year, still being virtual, will feel strange, but we will end up adapting and doing the best we can" (P495) (Figure 7).
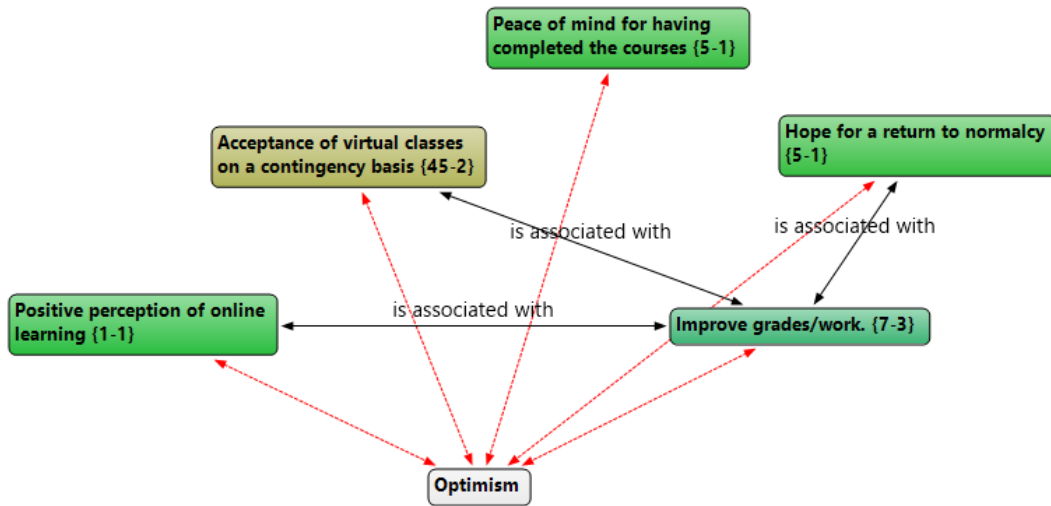
Figure 7: Optimism

Optimism is also associated with the desire to improve learning and grades, despite the uncertainty of contingency. Other optimism-related statements have to do with the hope for an immediate return to normality: "That everything will return to normal as soon as possible and that we will be great future teachers despite this situation we are going through, having peace of mind for having completed our studies" (P450).

Discussion

The continuity of educational services in emergencies must consider the students, who require a strategic plan, effective communication, and quality tools and services for their educational process. Our study results indicated that successful learning depends, partly, on the academic, organisational and technological management that the university implements in the crisis scenario (Garcia-Penalvo et al., 2020; Spais & Paul, 2021; Vicario-Solórzano & Huerta-Cuervo, 2021) (Figures 5 and 6). However, adequate attention to Theme (3), emotional state, which impacts teaching and learning, cannot be set to the side. University management must implement plans to address students' emotional problems in the new normality (Llerena-Izquierdo et al., 2020). Students demand that the educational process provides appropriate learning, close and empathetic teaching, and strategies to avoid emotional problems and provide assistance when they occur.

Learning processes must include strategies to counteract the feeling of loss of status as a student. Participants reported how work overload, lack of spaces such as laboratories or libraries, the longing for communal university life, and difficulties in self-management of learning led to a perceived ineffectiveness of online learning (Figure 2). These can be countered with strategic, collaborative communication, for example, appropriately using social networks (Jowsey et al., 2020; Mirza et al., 2021; Sobaih et al., 2020). The severing of social ties, which leads to a perceived loss of student status, must be avoided to reduce the constant and practical need for face-to-face attendance (Deora et al., 2020; Noskova et al., 2021). This is important, not only in e-learning but also in blended learning, which has gradually started in universities.

Teaching is also one of the determining elements in the learning experience in a context of crisis. Several comments referred to teachers' adaptation to the new educational modality: "I think that some teachers need to adapt and improve virtual classes" (Figure 3). The attention paid to the needs of students in this study (Hargitai et al., 2021) aligns with other research that supports the importance of achieving an empathetic connection with the educational community (Kalloo et al., 2020). Teachers must have the digital and pedagogical skills to teach using different tools under an instructional design that considers students' social, cognitive, and emotional needs (Cicha et al., 2021; Okada & Sheehy, 2020). In short, students need teaching that is empathetic and genuinely involved in their development, where lesson delivery and assessment are adapted to the context of crisis and virtual or blended learning, with a total focus on learning.

Comprehensive psychological care is not only the teacher's task but a shared responsibility that should be addressed systematically by the University. It is noteworthy that the explicit statements of emotional care needs were not very well substantiated in the students' responses (Figure 4). However, problems such as stress, depression, anxiety, and demotivation were evident as a constant in the students' experience, which they perceived to be solved only by the teacher. However, there is no overt mention of comprehensive psychological care: "On the part of the students, both last year and this year, we have felt completely abandoned. Out of five teachers, only one was interested in our mental health." This problem is reflected in previous studies (Al-Nuaimi, 2021; Prilutskaya & Grjibovski, 2020), thereby confirming the need to break the monotony in distance learning or hybrid model designs and to addressing the mental health needs of each student systematically.

Conclusions

In conclusion, the needs and expectations of students in a health emergency, such as the Covid-19 pandemic, depend on university management developing and implementing a clear plan of action, constantly communicating with students, training teachers in the virtual and hybrid modalities, and building empathetic relationships in the university community. The results respond to the limitations of other studies by considering the concerns of students (Hargitai et al., 2021) and their satisfaction (Ismaili, 2021) to improve pedagogical processes while acknowledging the demand to master educational technology (Carrillo & Flores, 2020; Llerena-Izquierdo et al., 2020). Due to constant changes in the

progress of the pandemic, it is necessary to conduct similar research to build a knowledge base for decision-making and improving educational practices and conduct analyses that compare education during Covid-19 in different regions and countries.

Acknowledgments

References

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D. & Pakpour, A. H. (2020). The fear of COVID-19 Scale: Development and initial validation. *International Journal of Mental Health and Addiction*, online first. https://doi.org/10.1007/s11469-020-00270-8

Akcil, U. & Bastas, M. (2021). Examination of university students' attitudes towards e-learning during the COVID-19 pandemic process and the relationship of digital citizenship. *Contemporary Educational Technology*, 13(1), 1-13. https://doi.org/10.30935/CEDTECH/9341

Al-Nuaimi, M. N. (2021). An integrated conceptual model for understanding the adoption of learning management systems in higher education during the COVID-19 outbreak. In M. Al-Emran & K. Shaalan (Eds.), *Recent advances in technology acceptance models and theories* (pp. 29-40). Springer Nature Switzerland. https://doi.org/10.1007/978-3-030-64987-6_3

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W. & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales (DASS) in clinical groups and a community sample. *Psychological Assessment*, 10(2), 176-181. https://doi.org/10.1037/1040-3590.10.2.176

Armoed, Z. (2021). The Covid-19 pandemic: Online teaching and learning at higher education institutes. *IOP Conference Series: Earth and Environmental Science*, 654(1), article 012026. https://doi.org/10.1088/1755-1315/654/1/012026

Arora, S., Chaudhary, P. & Singh, R. K. (2021). Impact of coronavirus and online exam anxiety on self-efficacy: The moderating role of coping strategy. *Interactive Technology and Smart Education*, 18(3), 475-492. https://doi.org/10.1108/ITSE-08-2020-0158

Atienza, F. L., Pons, D., Balaguer, I., & García-Merita, M. (2000). Propiedades Psicométricas de la Escala de Satisfacción con la Vida en Adolescentes [Psychometric Properties of the Life Satisfaction Scale in Adolescents]. *Psicothema, 12*(2), 314–319. https://reunido.uniovi.es/index.php/PST/article/view/7597

Atkins, L. & Wallace, S. (2015). Interviewing in educational research. In L. Atkins & S. Wallace (Eds.), *Qualitative research in education* (pp. 85-106). SAGE Publications. https://sk.sagepub.com/Books/qualitative-research-in-education

Barrera, J. E. C., Tovar-Torres, C., Daza, J. & Polanco, J. G. C. (2020). Perception of virtual university education in the Covid19. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao*, *2020*(E31), 297-308. https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/en/covidwho-822531

Bokova, I. (2014). *UNESCO education strategy 2014-2021*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000231288.locale=es

Cao, J., Yang, T., Lai, I. K. W. & Wu, J. (2021). Is online education more welcomed during COVID-19? An empirical study of social impact theory on online tutoring platforms. *International Journal of Electrical Engineering & Education*, online first. https://doi.org/10.1177/0020720920984001

Carrillo, C. & Flores, M. A. (2020). COVID-19 and teacher education: A literature review of online teaching and learning practices. *European Journal of Teacher Education*, 43(4), 466-487. https://doi.org/10.1080/02619768.2020.1821184

Cicha, K., Rizun, M., Rutecka, P. & Strzelecki, A. (2021). COVID-19 and higher education: First-year students' expectations toward distance learning. *Sustainability*, 13(4), article 1889. https://doi.org/10.3390/su13041889

Creswell, J. W. & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publishing. https://au.sagepub.com/en-gb/oce/qualitative-inquiry-and-research-design-international-student-edition/book254816

De Oliveira-Araújo, F. J., Abrantes de Lima, L. S., Martins-Cidade, P. I., Bezerra-Nobre, C. & Rolim-Neto, M. L. (2020). Impact of Sars-Cov-2 and its reverberation in global higher education and mental health. *Psychiatry Research*, 288, article 112977. https://doi.org/10.1016/j.psychres.2020.112977

Denisova, E., Ermakov, P., Skirtach, I. & Korkhova, V. (2020). Subjective discomfort and personality traits of university teachers during the COVID-19 pandemic. In D. Rudoy, A. Olshevskaya & V. Kankhva (Eds.), *E3S Web of Conferences*, 210, article 19021. EDP Sciences. https://doi.org/10.1051/e3sconf/202021019021

Deora, H., Mishra, S., Tripathi, M., Garg, K., Tandon, V., Borkar, S., Varshney, N., Raut, R., Chaurasia, B., Chandra, P. S., & Kale, S. S. (2020). Adapting neurosurgery practice during the COVID-19 pandemic in the Indian subcontinent. *World Neurosurgery*, 142, e396-e406. https://doi.org/10.1016/j.wneu.2020.07.038

Diener, E., Emmons, R. A., Larsem, R. J. & Griffin, S. (2010). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49(1), 71-75. https://doi.org/10.1207/S15327752JPA4901_13

Dietrich, N., Kentheswaran, K., Ahmadi, A., Teychene, J., Bessiere, Y., Alfenore, S., Laborie, S., Bastoul, D., Loubiere, K., Guigui, C., Sperandio, M., Barna, L., Paul, E., Cabassud, C., Line, A. & Hebrard, G. (2020). Attempts, successes, and failures of distance learning in the time of Covid-19. *Journal of Chemical Education*, 97(9), 2448-2457. https://doi.org/10.1021/acs.jchemed.0c00717

Ela, M. Z., Shohel, T. A., Shovo, T. E. A., Khan, L., Jahan, N., Hossain, M. T. & Islam, M. N. (2021). Prolonged lockdown and academic uncertainties in Bangladesh: A qualitative investigation during the COVID-19 pandemic. *Heliyon*, 7(2), article E06263. https://doi.org/10.1016/j.heliyon.2021.e06263

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 4(1), 215824401452263. https://doi.org/10.1177/2158244014522633

Fernandes, A. J. (2020). Impact of COVID-19: University students' perspective. *International Journal of Nutrition, Pharmacology, Neurological Diseases*, 10(3), 168-169. https://www.ijnpnd.com/text.asp?2020/10/3/168/292689

Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., & Muñiz, J. (2010). Propiedades psicométricas de la depression anxiety and stress scales-21 (dass-21) en universitarios españoles [Psychometric properties of the Depression Anxiety and Stress Scales-21 (DASS-21) in Spanish college students]. *Ansiedad y Estrés, 16*(2–3), 215–226. http://www.ansiedadyestres.org/content/vol-16_2-3-pp-215-226-2010

Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J. & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, 17(6), 791-802. https://doi.org/10.1016/0191-8869(94)90048-5

Garcia-Penalvo, F. J., Rector, R. R. O., Rodriguez-Conde, M. J. & Rodriguez-Garcia, N. (2020). The institutional decisions to support remote learning and teaching during the COVID-19 pandemic. In *Proceedings 10th International Conference on Virtual Campus, JICV 2020*, pp. 1-5. https://doi.org/10.1109/JICV51605.2020.9375683

González, M., Cubas, R., Rovella, A. T., & Darias-Herrera, M. (2006). Adaptación española de la Escala de Intolerancia hacia la Incertidumbre: procesos cognitivos, ansiedad y depresión [Spanish adaptation of the Scale of Intolerance towards Uncertainty: cognitive processes, anxiety and depression]. *Psicología y Salud, 16*(2), 219–233. https://doi.org/10.25009/PYS.V16I2.775

Hargitai, D. M., Pinzaru, F. & Veres, Z. (2021). Integrating business students' e-learning preferences into knowledge management of universities after the COVID-19 pandemic. *Sustainability*, 13(5), article 2478. https://doi.org/10.3390/su13052478

Hidayati, D. & Saputra, W. A. (2020). Implementation of online learning during the covid-19 epidemic in Indonesia: Assessment of higher education students' use and implementation of online learning technology. *Universal Journal of Educational Research*, 8(10), 4514-4519. https://doi.org/10.13189/ujer.2020.081019

Huang, R., Tlili, A., Chang, T. W., Zhang, X., Nascimbeni, F. & Burgos, D. (2020). Disrupted classes, undisrupted learning during COVID-19 outbreak in China: Application of open educational practices and resources. *Smart Learning Environments*, 7, article 19. https://doi.org/10.1186/s40561-020-00125-8

Huarcaya-Victoria, J., Villarreal-Zegarra, D., Podestà, A., & Luna-Cuadros, M. A. (2020). Psychometric Properties of a Spanish Version of the Fear of COVID-19 Scale in General Population of Lima, Peru. *International Journal of Mental Health and Addiction, 20*(1), 249–262. https://doi.org/10.1007/S11469-020-00354-5/FIGURES/2

Husky, M. M., Kovess-Masfety, V. & Swendsen, J. D. (2020). Stress and anxiety among university students in France during Covid-19 mandatory confinement. *Comprehensive Psychiatry*, 102, article 152191. https://doi.org/10.1016/j.comppsych.2020.152191

Ismaili, Y. (2021). Evaluation of students' attitude toward distance learning during the pandemic (Covid-19): A case study of ELTE university. *On the Horizon*, 29(1), 17-30. https://doi.org/10.1108/OTH-09-2020-0032

Jowsey, T., Foster, G., Cooper-Ioelu, P. & Jacobs, S. (2020). Blended learning via distance in pre-registration nursing education: A scoping review. *Nurse Education in Practice*, 44, article 102775. https://doi.org/10.1016/j.nepr.2020.102775

Kalloo, R. C., Mitchell, B. & Kamalodeen, V. J. (2020). Responding to the COVID-19 pandemic in Trinidad and Tobago: Challenges and opportunities for teacher education. *Journal of Education for Teaching*, 46(4), 452-462. https://doi.org/10.1080/02607476.2020.1800407

Karpman, M., Zuckerman, S., Gonzalez, D. & Kenney, G. M. (2020). *The COVID-19 pandemic is straining families' abilities to afford basic needs: Low-income and Hispanic families the hardest hit.* Center on Immigration and Child Welfare, School of Social Work, New Mexico State University. https://cimmcw.org/the-covid-19-pandemic-is-straining-families-abilities-to-afford-basic-needs/

Kulikowski, K., Przytuła, S. & Sułkowski, Ł. (2021). E-learning? Never again! On the unintended consequences of COVID-19 forced e-learning on academic teacher motivational job characteristics. *Higher Education Quarterly*, 76(1), 174-189. https://doi.org/10.1111/hequ.12314

Lee, K., Fanguy, M., Lu, X. S. & Bligh, B. (2021). Student learning during COVID-19: It was not as bad as we feared. *Distance Education*, 42(1), 164-172. https://doi.org/10.1080/01587919.2020.1869529

Llerena-Izquierdo, J., Barcia-Ayala, O. & Ayala-Carabajo, R. (2020). Faculty training through crowdlearning for emerging online education. *2020 IEEE ANDESCON*, 1-7. https://doi.org/10.1109/ANDESCON50619.2020.9272103

Longhurst, G. J., Stone, D. M., Dulohery, K., Scully, D., Campbell, T. & Smith, C. F. (2020). Strength, weakness, opportunity, threat (SWOT) analysis of the adaptations to anatomical education in the United Kingdom and Republic of Ireland in response to the COVID-19 Pandemic. *Anatomical Sciences Education*, 13(3), 301-311. https://doi.org/10.1002/ase.1967

Marek, M. W., Chew, C. S. & Wu, W. C. V. (2021). Teacher experiences in converting classes to distance learning in the COVID-19 pandemic. *International Journal of Distance Education Technologies*, 19(1), 89-109. https://doi.org/10.4018/IJDET.20210101.oa3

Martín-García, A. V., García, Á., & Muñoz-Rodríguez, J. M. (2014). Factores determinantes de adopción de blended learning en educación superior. Adaptación del modelo UTAUT [determinants of blended learning adoption in higher education. Adaptation of the UTAUT model]. *Educación XX1, 17*(2), 217–240. https://doi.org/10.5944/educxx1.17.2.11489

Mendoza, D., Cejas, M., Rivas, G. & Varguillas, C. (2021). Тревога как преобладающий фактор успеваемости студентов математических направлений университета во время пандемии COVID-19 [Anxiety as a prevailing factor of performance of university mathematics students during the COVID-19 pandemic. *Obrazovanie i Nauka [The Education and Science Journal]*, 23(2), 94-113. https://doi.org/10.17853/1994-5639-2021-2-94-113

Merriam, S. B. & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass. https://www.wiley.com/en-gb/Qualitative+Research:+A+Guide+to+Design+and+Implementation,+4th+Edition-p-9781119003618

Mirza, Q., Pathan, H., Khokhar, S., Raheem, M. A., & Mushtaq, F. (2021). English reading habits in online learning among tertiary learners in Pakistan: Evaluating the impact of COVID. *Asian EFL Journal*, 28(1), 1-20. https://www.researchgate.net/publication/349833821

Moghaddam, A. (2006). Coding issues in grounded theory. *Issues In Educational Research*, 16(1), 52-66. http://iier.org.au/iier16/moghaddam.html

Noskova, A. V., Goloukhova, D. V., Proskurina, A. S. & Nguen, H. T. (2021). Цифровизация образовательной среды: оценки студентами России и Вьетнама рисков дистанционного обучения [Digitalization of the educational environment: Risk assessment of distance education by Russian and Vietnamese students]. *Vysshee Obrazovanie v Rossii [Higher Education in Russia]*, 30(1), 156-167. https://doi.org/10.31992/0869-3617-2021-30-1-156-167

Okada, A. & Sheehy, K. (2020). Factors and recommendations to support students' enjoyment of online learning with fun: A mixed method study during COVID-19. *Frontiers in Education*, 5, article 584351. https://doi.org/10.3389/feduc.2020.584351

Pintrich, P. R., Smith, D. A. F., Garcia, T. & Mckeachie, W. J. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational and Psychological Measurement*, 53(3), 801-813. https://doi.org/10.1177/0013164493053003024

Prilutskaya, M. V. & Grjibovski, A. M. (2020). Perception of the state of emergency due to Covid-19 by medical students and staff in a Kazakhstani university. *Ekologiya Cheloveka (Human Ecology)*, 2020(6), 4-12. https://hum-ecol.ru/1728-0869/article/view/42407

Robinson, K. (2011). The trouble with education. In K. Robinson (Ed.), *Out of our minds. Learning to be creative* (pp. 49-80). Capstone. https://doi.org/10.1002/9780857086549

Rodriguez, I. & Gallardo, K. (2017). Redesigning an educational technology course under a competency-based performance assessment model. *Pedagogika*, 127(3), 186-204. https://doi.org/10.15823/p.2017.48

Rodríguez-Rivas, M. E., Cangas, A. J. & Fuentes-Olavarría, D. (2021). Controlled study of the impact of a virtual program to reduce stigma among university students toward people with mental disorders. *Frontiers in Psychiatry*, 12, article 632252. https://doi.org/10.3389/fpsyt.2021.632252

Romero-Rodríguez, J.-M., Alonso-García, S., Marín-Marín, J.-A. & Gómez-García, G. (2020). Considerations on the implications of the Internet of things in Spanish universities: The usefulness perceived by professors. *Future Internet*, 12(8), article 123. https://doi.org/10.3390/fi12080123

Romero-Rodriguez, J.-M., Aznar-Diaz, I., Hinojo-Lucena, F.-J. & Gomez-Garcia, G. (2020). Mobile learning in higher education: Structural equation model for good teaching practices. *IEEE Access*, 8, 91761-91769. https://doi.org/10.1109/ACCESS.2020.2994967

Saldaña, J. (2010). *The coding manual for qualitative researchers* (3rd ed.). SAGE. [3rd ed.] https://au.sagepub.com/en-gb/oce/the-coding-manual-for-qualitative-researchers/book243616

San Martín-Cantero, D. (2014). Teoría fundamentada y Atlas.ti: recursos metodológicos para la investigación educativa [Grounded theory and Atlas.ti: Methodological resources for educational research]. *Revista Electrónica de Investigación Educativa*, 16(1), 104-122. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1607-40412014000100008

Scott, C. & Medaugh, M. (2017). Axial coding. In J. Matthes, C. S. Davis & R. F. Potter (Eds.), *The international encyclopedia of communication research methods*. Wiley. https://doi.org/10.1002/9781118901731.iecrm0012

Sobaih, A. E. E., Hasanein, A. M. & Abu Elnasr, A. E. (2020). Responses to COVID-19 in higher education: Social media usage for sustaining formal academic communication in developing countries. *Sustainability*, 12(16), article 6520. https://doi.org/10.3390/su12166520

Spais, G. & Paul, P. (2021). A crisis management model for marketing education: Reflections on marketing education system's transformation in view of the Covid-19 crisis. *Marketing Education Review*, 31(4), 322-339. https://doi.org/10.1080/10528008.2021.1951120

Tinoco, L. F., Barraza, E., Hern, A., & Zapata, L. (2011). Validación del cuestionario de motivación y estrategias de aprendizaje forma corta –MSLQ SF, en estudiantes universitarios de una institución pública-Santa Marta [Validation of the motivation questionnaire and learning strategies short form -MSLQ SF, in university students of a public institution-Santa Marta. *Psicogente, 14*(25), 36–50. http://revistas.unisimon.edu.co/index.php/psicogente/article/view/1855

Vela, F. (2001). Un acto metodológico básico de la investigación social: la entrevista cualitativa [A basic methodological act of social research: The qualitative interview]. In M. L. Tarrés (Ed.), *Observar, escuchar y comprender: Sobre la tradición cualitativa en la investigación social [Observe, listen and understand: On the qualitative tradition in social research]* (pp. 63-95). FLACSO México. https://www.academia.edu/951826/Un_acto_metodológico_básico_de_la_investigación_social_la_entrevista_cualitativa

Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, 27(3), 425-478. https://doi.org/10.2307/30036540

Vicario-Solórzano, C. M. & Huerta-Cuervo, R. (2021). Dimensiones para el análisis [Dimensions for analysis]. In C. M. Vicario-Solórzano (Ed.), *Modelo de continuidad de servicios educativos ante un contexto de emergencia y sus etapas de crisis [Continuity model of educational services in an emergency context and its crisis stages]* (1st ed., pp. 43–54). Corporación Universitaria para el Desarrollo de Internet, A. C. (CUDI). https://hdl.handle.net/11285/637146

Abel García-González (corresponding author) is candidate of the PhD program in Educational Innovation in the Tecnologico de Monterrey, Mexico. His research interests include the development of social entrepreneurship education, experiential learning for social change and educational innovation.
ORCID: https://orcid.org/0000-0002-3885-9772
Email: abelgar.g@gmail.com

Inmaculada Aznar-Diaz is currently a Lecturer Professor with the Didactics and School Organisation Department, University of Granada, Spain. She works in the line of school organisation, digital competence in education, training for employment, and active learning methodologies.
ORCID: https://orcid.org/0000-0002-0018-1150
Email: iaznar@ugr.es

María Soledad Ramírez-Montoya works at the School of Humanities and Education of the Tecnologico de Monterrey, Mexico. Her research interests include teaching strategies, technology resources for education, training of educational researchers and open education movement.
ORCID: https://orcid.org/0000-0002-1274-706X
Email: solramirez@tec.mx

José María Romero-Rodríguez is a research professor at Educational Sciences, University of Granada, Spain. He deals with the issues of mobile learning, educational innovation, and Internet addiction.
ORCID: https://orcid.org/0000-0002-9284-8919
Email: romejo@ugr.es