

Higher education and pandemic: a pilot study of educational experience during a pandemic questionnaire

***David Moreno Candil**

Universidad Autónoma de Occidente, Sinaloa, México
<https://orcid.org/0000-0001-7521-1345>

Edwin Ricardo Bravo Verdugo

Universidad Michoacana de San Nicolás de Hidalgo, Michoacán, México
<https://orcid.org/0000-0001-7212-3294>

César Jesús Burgos Dávila

Universidad Autónoma de Sinaloa, Sinaloa, México
<https://orcid.org/0000-0001-7701-8266>

Abel Antonio Grijalva Verdugo

Universidad Autónoma de Occidente, Sinaloa, México
<https://orcid.org/0000-0001-8828-7269>

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Abstract

Introduction. The COVID-19 pandemic led most countries to suspend face-to-face educational activities. In Mexico, it was determined to continue the school year through distance learning. Due to the atypical nature of the situation, there are no tools to evaluate the student's experience with this measure. **Objective.** Design and evaluate the psychometric properties of the Pandemic Educational Experience Questionnaire (CEEP). **Method.** The CEEP consists of 89 items on a Likert scale, it was applied to a non-probabilistic sample of 1,441 Mexican students of higher education. **Results.** An Exploratory Factor Analysis was carried out, items with a factor load lower than 0.40 were eliminated, the remaining items were grouped into 9 factors (50.836% of the total variance). The factors and the questionnaire in general yielded acceptable internal consistency values ($0.670 \geq \alpha \geq 0.991$). **Discussion.** The CEEP is considered an adequate tool to evaluate the student experience during the pandemic. Results showed that students valued positively their aptitudes for distance learning (EaD), as well as the quality and behavior of their teachers; despite this, they report less satisfaction with the dynamics of the EaD and a negative emotional experience.

Keywords: higher education; distance learning; questionnaire design; exploratory factor analysis; COVID-19.

Educación superior y pandemia: estudio piloto del cuestionario de experiencia educativa durante pandemia

Resumen

Introducción. La pandemia de la COVID-19 llevó a que la mayoría de los países suspendieran las actividades educativas de forma presencial. En México se optó por continuar el ciclo escolar a distancia. Debido a lo atípico de la situación, no se cuentan con herramientas para evaluar la experiencia del estudiantado ante esta medida. **Objetivo.** Diseñar y evaluar las propiedades psicométricas del Cuestionario de Experiencia Educativa durante Pandemia (CEEP). **Método.** El CEEP consta de 89 ítems en escala Likert, se aplicó a una muestra no probabilística de 1,441 estudiantes mexicanos de educación superior. **Resultados.** Se realizó un Análisis Factorial Exploratorio, se eliminaron ítems con carga factorial inferior a 0.40, ítems restantes se agruparon en 9 factores (50.836% de la varianza total). Los factores y el cuestionario en general arrojaron valores aceptables de consistencia interna ($0.670 \leq \alpha \leq 0.991$). **Discusión.** Se considera que el CEEP es una herramienta adecuada para evaluar la experiencia estudiantil durante la pandemia. El estudiantado valora positivamente sus aptitudes para la educación a distancia (EaD), así como la calidad y proceder de sus docentes; pese a ello reportan menor satisfacción con la dinámica de la EaD y una experiencia emocional negativa.

Palabras clave: educación a distancia; educación superior; diseño de herramientas de medición; análisis factorial exploratorio; COVID-19.

Ensino superior e pandemia: um estudo piloto do questionário de experiência educacional durante pandemia

Resumo

Introdução. A pandemia COVID-19 levou a maioria dos países a suspender as atividades educacionais presenciais. No México, foi decidido continuar o ano letivo remotamente. Devido à natureza atípica da situação, não existem ferramentas para avaliar a experiência do aluno com esta medida. **Objetivo.** Projetar e avaliar as propriedades psicométricas do Questionário de Experiência Educacional Pandêmica (CEEP). **Método.** O CEEP é composto por 89 itens em escala Likert e foi aplicado a uma amostra não probabilística de 1.441 estudantes mexicanos do ensino superior. **Resultados.** Foi realizada uma Análise Fatorial Exploratória, os itens com carga fatorial inferior a 0,40 foram eliminados, os demais itens foram agrupados em 9 fatores (50,836% da variância total). Os fatores e o questionário em geral produziram valores de consistência interna aceitáveis ($0,670 < \alpha < 0,991$). **Discussão.** O CEEP é considerado uma ferramenta adequada para avaliar a experiência do aluno durante a pandemia. O corpo discente valoriza positivamente suas aptidões para a educação a distância (EaD), bem como a qualidade e o comportamento de seus professores; apesar disso, relatam menos satisfação com a dinâmica da EaD e experiência emocional negativa.

Palavras-chave: educação superior; educação a distância; desenho de ferramentas de medição; análise fatorial exploratória; COVID-19.

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Introduction

The spread of the SARS-CoV-2 virus, also known as COVID-19, was very quick and on a global scale. Due to the seriousness of the situation, the World Health Organization (WHO) declared it a pandemic (Forbes Staff, 2020). Following this declaration, several recommendations were communicated to the affected countries to contain the spread of the virus. One of the main measures was social distancing, which led several non-essential sectors to stop their in-person activities. Among the sectors affected by this measure was the education sector.

In Mexico, following the recommendations and guidelines established by the WHO, the Ministry of Health (2020) launched the *National Healthy Distance Day*. This led the Ministry of Public Education to announce on March 14, 2020, that in-person school activities would be suspended as of March 23, a week in advance to begin planning the subsequent strategy (O. García, 2020). It was stated that the school year would be completed using Distance Education (DE) through Information and Communication Technologies (ICTs).

This measure was implemented at all education levels, which led to the sudden transition of millions of students from an in-person education model to a DE model, which, due to the urgency of the global situation, had little time to be planned (Didriksson, 2020). In the specific case of higher education in Mexico, this transition affected around 4 million students (López & Rodríguez, 2020). This sudden change in the way the educational process is carried out affects the daily life of students since, faced with the need or obligation to stay at home, they must make use of ICTs along with different competencies in order to study (Contreras & Méndez, 2015; Didriksson, 2020; López & Rodríguez, 2020; M. Sánchez et al., 2020).

It is important to point out that in Mexico, as in most Latin American countries, the implementation of DE faces several limitations, including the fact that access to electronic devices and internet connection, especially those of good quality, is concentrated in populations with higher acquisitive power (J. García, 2007). In other words, there is inequality between social classes

in access to the ICTs needed for DE, which limits educational reach through this means, leaving the most vulnerable sectors out (Lloyd, 2020).

In addition to the above, there are different characteristics in a learning community that influence the quality of the DE they receive, including social class, geographic location or place of origin, gender, type of institution to which they belong (public or private), among others (Castaman & Rodrigues, 2020; Lloyd, 2020). In this sense, it could be said that the use of DE in a population with heterogeneous characteristics and a wide access gap has increased an already existing education inequality during the health crisis (Plá, 2020).

The aforementioned gap is referred to as the digital divide, a concept for "inequality in access to ICTs, [...] people's digital capabilities, the values associated with their use, and the political and economic factors that affect their distribution" (Lloyd, 2020, pp. 115-116). In other words, the digital divide not only encompasses inequality in the acquisition of and/or access to ICTs but also refers to the skills required to use these technologies for a given purpose. Concerning the current situation, it could be said that the digital divide encompasses both unequal access to the materials needed for DE and the lack of student competencies to successfully carry out this educational modality. Consequently, having access to the necessary ICTs does not imply that the student has the competencies for DE (López & Rodríguez, 2020; Trejo-Quintana, 2020).

With respect to the digital divide, some institutions have tried to reduce its impact through different measures. For example, Universidad Autónoma Metropolitana donated electronic tablets with internet connection to students in vulnerable conditions, Universidad Nacional Autónoma de México partnered with a telephone company to provide students using its service with a faster internet connection at no cost. In addition, the federal scholarship program *Jóvenes Construyendo el Futuro* (Youths Building the Future) has donated computer equipment and smartphones to students from varied public universities (Lloyd, 2020).

Although these are palliative measures that seek to address the digital divide, it is important

to note that they only reach a very small part of the population that requires them (Lloyd, 2020). It should also be mentioned that these measures only address the digital divide in terms of access to ICTs, but do not address the aspect of the competencies required for DE, the lack of the latter being a problem that is present in the student population. An example of this can be seen in the figures reported by the Central de Estudiantes Universitarios (University Students' Organization) from the Universidad Nacional Autónoma de México, which indicate that 67.3% of its student population, from the mid-high level to postgraduate level, has not been able to adapt to the style of work involved in DE, which becomes a barrier to obtaining a quality education (Román, 2020).

The above could be due to the abrupt implementation of DE, given that the transition from in-person education to a distance model requires a period of adaptation since students are accustomed to a certain type of dynamics in in-person education, which are, to a great extent, different from those of DE. Likewise, the skills required, or at least the level of development of these skills for DE, are different from those for in-person education, since for the former the skills of self-management, self-regulation, and intrinsic motivation in the students are indispensable, as in this education modality the role of the professor is much smaller than in the in-person modality (Contreras & Méndez, 2015; Ramos et al., 2010).

Invariably, the 2019-2020 academic year—the first attempt to keep the education system active during the health contingency caused by COVID-19—ended at the federal level on June 5 (with some variations in the date within the states) with 30 million students who attended the last part of the school year remotely (Wong, 2020a). As this academic term was concluding, discussions to evaluate the different strategies implemented during the part of the academic term taught remotely began, aiming to determine what path to follow in the 2020-2021 academic year (Ortega, 2020).

Although comparatively, infection figures in Mexico remained low during the period around the end of the 2019-2020 academic year (Animal Político, 2020a), the 2020-2021 school

year also began with DE through the *Aprende en Casa 2* (Learn from Home 2) program for basic education (Animal Político, 2020b). In the case of higher education, both the Ministry of Public Education and the National Association of Universities and Higher Education Institutions (ANUIES), reached an agreement to start the academic term remotely on September 7, 2020 (A. Sánchez, 2020; Wong, 2020b). ANUIES (2020) indicated that the return to classes would be through DE, respecting the staggered process proposed by the health authorities; that on-site activities would only be resumed when the rate of transmission, appearance of new cases, and hospital occupancy decreased significantly and maintained a downward trend for a certain period of time (approximately one month); in addition, this measure would only be considered in municipalities that are adjacent to others with the same characteristic.

By the end of 2020, the situation in Mexico was complex; on the one hand, it is the fourth country with the highest number of deaths from COVID-19 in the world (RTVE.es, 2021); on the other hand, it has announced the beginning of a vaccination campaign against the virus and has begun to outline protocols for the vaccination of the general population (Aristegui Noticias, 2020). Although vaccination campaigns are necessary to face the pandemic, as national and international authorities have pointed out, the extent of the spread of the virus and the complexity of involved in reaching the entire population with the vaccine suggest that, at least during 2021, there will still be a possibility of contagion even if the population is vaccinated (Corral, 2020). Likewise, the WHO pointed out that COVID-19 is only the beginning of future health emergencies (Vélez, 2020). This creates a discouraging outlook for the education sector, in which teaching-learning processes are expected to alternate between in-person and distance learning periods.

Due to the above, specifically in the education sector, it is imperative to create action protocols for situations such as the one caused by COVID-19, and not just hasty responses in the face of similar situations (ANUIES, 2020). Such protocols should be based on the information obtained from the evaluation of the strategies used during the

COVID-19 contingency (Ortega, 2020), which becomes problematic due to the lack of tools to evaluate such strategies (Roger-García, 2020). Thus, the aim of the present study was to develop the Questionnaire on Educational Experience During the Pandemic (CEEP) and to describe its psychometric properties, in order to explore the assessment, appreciation, and disposition of higher education students in Mexico with regards to this teaching modality.

Due to the novelty of the educational situation caused by the health contingency derived from COVID-19, the design of the CEEP was based on the review of empirical studies on the educational reality that arose in the early stages of the confinement; theoretical aspects of the student profile required for DE; and the institutional, teaching, and student variables that affect the quality of DE.

The empirical information that served as the basis for the design of the items came from studies conducted by M. Sánchez et al. (2020), Castaman & Rodrigues (2020), and Moreno-Candil & Bravo-Verdugo (in press). M. Sánchez et al. (2020) conducted a study on professors at a higher education institution in which they examined the professors' experience with DE during the period of social distancing. The study focused on the problems that professors experienced with regard to DE, as well as the problems they perceived in their students. The authors classified the problems, both their own and those of the students, reported by the professors into four categories: (a) logistical, referring to the management and availability of time and physical spaces for DE; (b) technological, referring to the access to and necessary knowledge of ICTs, and Internet connection required to participate in DE; (c) socio-affective, referring to the emotional, affective, and health condition of professors and students, such as feelings of frustration, fatigue, etc.; and (d) pedagogical (in the case of professors), referred to the knowledge of didactic tools necessary for DE, or educational (in the case of students), referred to the skills necessary to participate in DE.

In the work of Castaman & Rodrigues (2020), the authors analyzed the potential and limitations of DE during the COVID-19 pandemic. The results of

this study reported certain difficulties related to ICTs on the part of students, as well as difficulties in understanding and learning through DE, and a preference or affinity for in-person classes. Meanwhile, the study by Moreno-Candil & Bravo-Verdugo (in press) explored the learning experience of students in a higher education institution, asking about the pedagogical strategies implemented by the faculty, the perceived effectiveness of these strategies by the students, and the psychological state derived from DE during the pandemic. In this study, the authors found that students reported greater effectiveness of pedagogical strategies that have some similarities with in-person education strategies. They also found a gap in access to ICTs and feelings of stress, anxiety, confusion, frustration, and overwhelm resulting from the implementation of DE during the pandemic.

Regarding the profile of the students needed for DE and the variables that influence its quality, the works of Contreras & Méndez (2015) and Vásquez & Rodríguez (2007) were taken up. In these works, it was found that the characteristics required by students are self-management skills, self-regulation, and achievement motivation, as well as competencies for written communication and the use of ICTs focused on the learning process. It is also pointed out that professors must have pedagogical strategies that promote student learning and provide some flexibility, unlike in-person education. As for the institution, it should facilitate administrative processes and provide an institutional environment through digital platforms in which students can be attended by both professors and administrative staff.

Method

Design

This study corresponds to an instrumental design (Ato et al., 2013; Montero & León, 2002) or psychometric study (Cortada de Kohan, 2002). This type of study "includes all those studies that analyze the psychometric properties of psychological measurement instruments, even new tests" (Ato et al., 2013, p. 1042). The

classification of the study is due to the need for a tool to evaluate the assessment, appreciation, and disposition of students regarding the educational strategies and dynamics used during the pandemic in response to the novelty of this phenomenon.

Participants

The sample collected for the present study was a non-probability sample (Coolican, 2005). It consisted of 1,441 students coming mainly (96%) from two public universities in northwestern Mexico, with a mean age of 25.25 years ($SD=8.55$, $Min=17$, $Max=68$). The sample size was thus defined by two criteria: the first was established by the time available for data collection (see Procedure section). The second was to achieve a sample size that allowed a confidence level of at least 95% ($n > 383$ for large populations). Of the students, 65.4% were studying for a degree in Psychology, 20.8% for a degree in Social Work, and 6.0% for one in Computer Science, while the remaining percentage came from the Communication Sciences, Dentistry, Medicine, Nutrition, and Psycho-pedagogy programs. With regard to grade level, 16.7% of the students were in the first grade of their undergraduate studies, 24.4% in the second, 39% in the third, 18.7% in the fourth, and 1.0% in the fifth. The distribution according to sex was 80.3% female and 19.7% male. Of the sample, 42.8% reported being working. A total of 57.2% reported belonging to a school-based educational program, while the remaining 42.8% indicated that they were enrolled in a blended system in which they attend classes on weekends. It is worth noting that the age range reported is impacted by this last characteristic. In general, the participants in the blended learning 28.9% de los que asisten de manera presencial). modality are older than those who attended in-person classes prior to the pandemic ($t(685) = 22.15$, $p < 0.001$). They are also the ones with the highest participation in the labor market (60.6% versus 28.9% of those who attended in person).

Instruments

The Questionnaire on Educational Experience during Pandemic (CEEP) was designed based on the results of empirical studies on educational

experience at the beginning of the pandemic confinement conducted by M. Sánchez et al. (2020), Castaman & Rodrigues (2020), and Moreno-Candil & Bravo-Verdugo (in press), as well as the proposals of Contreras & Méndez (2015) and Vásquez & Rodríguez (2007) on the profile and competencies required of DE students. Based on this review, it is postulated that the educational experience of higher education students during the pandemic is defined by three main aspects: (a) access to ICTs and their quality, where the greater the access and the higher the quality, the better the educational experience; (b) the perception of teaching practice during the pandemic in relation to the degree to which the faculty and academic work is perceived to be adjusted to the situation being experienced; and, finally, (c) the aptitudes and emotional state of the students that allow them to adequately cope with the new education modality. Thus, besides the section for the collection of sociodemographic data, the CEEP is a questionnaire composed of 89 items in a six-point Likert-type format, which are divided into three sections corresponding to the previously defined aspects.

The first section, made up of 26 items, broadly explores the availability and access of students to ICTs as a basic tool for the adequate use of DE. This section specifically explores elements related to students' access to ICTs (e.g., "*To use an electronic device that allows me to carry out my school activities I have to borrow it from someone else [e.g., relatives, friends, etc.]*,") the quality of these devices and their Internet connectivity (e.g., "*When I am carrying out my school activities online, the Internet connection is...*,") the availability of time and space to carry out their educational activities (e.g., "*I have a defined place to carry out my educational activities without being interrupted*,") and institutional actions aimed at facilitating DE (e.g., "*The university has offered alternatives for those who do not have the resources to carry out online activities*.")

The second section of the CEEP comprises 31 items that explore elements related to the pedagogical actions carried out by professors during the pandemic. Specifically, this section enquires about the resources used by professors to transition to the distance modality (e.g., "*Professors conduct virtual classes through*

video calls [e.g., Zoom, Skype, Jitsi, etc.],"), the accessibility and interaction with professors during the pandemic (e.g., "It was difficult to contact professors during the quarantine,"), the adjustments made to the content and/or structure of the subjects (e.g., "Teachers adapted their grading methods during the health contingency,"), the perception of the workload (e.g., "The time given to complete the work is little,"), and the evaluation of the professor's performance (e.g., "I consider that the professors are doing their best.")

Finally, the third section of the CEEP includes 32 items that explore emotional and aptitudinal aspects linked to the experience of studying remotely during the pandemic. The items that compose this section explore emotional experiences about the dynamics in remote learning during quarantine (e.g., "The way in which online activities are carried out has made me feel anxious,") affinity or liking for this teaching modality (e.g., "I consider that I have acquired sufficient knowledge by studying virtually,") and the appreciation of one's own aptitudes and skills that are necessary for distance learning (e.g., "I can identify reliable sources of online information.")

At the end of the CEEP, two multiple-choice items are included, asking to indicate the pedagogical dynamics or strategies considered to have had the greatest impact on learning, as well as those considered to have contributed to it the least. The proposed dynamics were taken from the work of Moreno-Candil & Bravo-Verdugo (in press). These two items are not considered in this study.

Procedure

Prior to the application of the CEEP, five specialists were asked to evaluate the questionnaire. The specialists that were consulted work in the fields of higher education, education, educational psychology, and psycho-pedagogy. Each of the specialists was e-mailed the objective of the study, the CEEP, the proposed dimensions, their description and rationale, as well as the items that comprise them. They were asked to evaluate the congruence between the items and the dimensions, the relevance of each dimension and

the items that comprise it, and their sufficiency. They were asked to respond in free format with any comments on the questionnaire. The experts' responses were analyzed, and modifications were made, resulting in the final version of 89 items described in the previous section.

The CEEP application was carried out using the Google Forms platform. Directors and professors from various universities were contacted to request their support in the application of the CEEP, and the characteristics of the questionnaire and the purpose of its application were explained. Likewise, a report of the results obtained was sent to the institution, program, or school that requested them. In this way, the collaboration of professors and directors of 10 schools and programs from six different universities was achieved. The link to the questionnaire was sent to the students from these schools and programs through the professors and directors who agreed to participate. Following the ethical considerations for empirical studies outlined by the American Psychological Association (APA, 2017), it was indicated that participation was voluntary and that, if they participated, their responses would be anonymous. Thus, written consent was dispensed with, since the task did not represent any risk for the participants, and the data collection instrument was completely anonymous (APA, 2017).

The collection of responses covered the period from June 3 to June 23, 2020. It is important to note that, in this period, most of the participating institutions had concluded or were about to conclude the 2019-2020 academic year, which explains why participation was considerably higher in some institutions. For data analysis, the results provided by the Google Forms platform were downloaded into a Microsoft Excel file, and then the participants' responses were entered into the SPSS v.25 program.

Data analysis

The data were processed using the SPSS v.25 program. In accordance with that proposed by various authors in the development of measurement tools (DeVellis, 2003; Muñiz & Fonseca-Pedrero, 2019), the values of the items were inverted to ensure the same direction in

the questionnaire scores; the underlying factor structure of the items was explored (Exploratory Factor Analysis); and the factor load of the items, the internal consistency of the questionnaire, and each dimension (Cronbach's alpha) was determined. Once the CEEP factors were established, in order to obtain more information on the students' experience with DE during the pandemic, we proceeded to explore the ordering of these dimensions with Friedman's non-parametric test for related samples to establish the most significant aspects of the distance education modality for the students during the pandemic. The Friedman test was chosen after analyzing the behavior of the data collected and finding that the assumptions for the use of parametric tests were not met (Coolican, 2005).

Results

The CEEP is proposed as a tool to explore the assessment, appreciation, and disposition of higher education students in Mexico in relation to DE, an educational modality that has been adopted as a strategy during the confinement derived from the COVID-19 pandemic. Although the questionnaire was constructed on the basis of what has been reported in studies on teaching during the pandemic and some general guidelines on the profile of DE students, it is necessary to analyze the behavior of the items and determine whether there are latent variables that emerge from the CEEP scores. To this end, the Exploratory Factor Analysis (EFA) technique was implemented, "a technique par excellence used to explore the set of latent variables or common factors that explain the responses to the items of a test" (Lloret-Segura et al., 2014, p. 1151).

It was also necessary to determine whether the data obtained allowed us to assume the existence of a factorial solution, for which we used Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The results of both tests allow us to assume that the items are sufficiently related (Bartlett's sphericity, $\chi^2(3916)=68331$, $p<0.001$) and the existence of common factors among the items (KMO= 0.945).

Having established the assumption of common dimensions among the items, we proceeded to explore this structure. Given that the items that make up the CEEP have more than five response options, and that the skewness and kurtosis values do not exceed the absolute value of 2, per Lloret-Segura et al. (2014), the Maximum Likelihood Estimation (MLE) method was used to estimate the factors. Regarding the assignment of items to factors, in the CEEP design process, the dimensions originally proposed were assumed, at a conceptual level, to be independent. That is, for example, there is no reason to assume that access to ICTs is related to the assessment of the pedagogical actions taken by professors. However, several authors point out the difficulty of complying with the assumptions of no relationship between the factors of psychological tests, so it is recommended when exploring the composition of the factors to start with an oblique rotation and subsequently determine whether or not there are strong correlations between the factors found (Lloret-Segura et al., 2014). Thus, at first, an EFA was performed through the MLE method with direct Oblimin rotation. A factorial solution of nine factors was obtained, among which the correlation values remained below 0.30. For this reason, it was decided to repeat the analysis, this time through an orthogonal rotation using the Varimax method.

With the intention of eliminating items that provided little information to the CEEP, those items whose factorial weight was less than 0.40 were eliminated, and the number of factors that made theoretical or conceptual sense in their interpretation and grouped at least three items were preserved. Also, although the following methods have been discarded, it was intended that the factors explained more than 50% of the variance and that their relevance was observed in the sedimentation graph (Lloret-Segura et al., 2014; Moral de la Rubia, 2006). Thus, the size of the CEEP was reduced from 89 to 76 items, distributed in 9 factors that explain 50.836% of the variance. Table 1 below summarizes the information related to each of these factors.

Once the underlying factors to the CEEP were identified, the internal consistency of the CEEP and of each of the factors was analyzed using Cronbach's alpha.

Table 1
CEEP Factors

Factor	# of items	Eigenvalue	% de Variance	Examples of items	Factor loading range
1. Quality of professor's role and practice	23	18.499	20.785	19. I believe that the professors are using all the resources available to them. 23. The professors explain the topics before leaving us with any activity.	0.413 a 0.816
2. ICTs quality and accessibility	11	6.634	7.454	10. The electronic devices (laptop, desktop computer, tablet and/or smartphone) I use are in good condition. 21. In order to use an electronic device to do my school activities, I have to go to a cyber-café or to someone else's house (e.g., family, friends, etc.).	0.434 a 0.805
3. Satisfaction with DE dynamics	10	5.585	6.275	10. I like the dynamics of studying online. 9. I would rather study online than go to school.	0.463 a 0.836
4. Disapproval of DE dynamics	8	3.763	4.228	29. I find the dynamics of the online activities boring. 26. It is easier to get distracted in virtual classes (e.g., Zoom, Jitsi, Meet, Teams, etc.) than in in-person classes.	0.459 a 0.624
5. Quality of didactic materials used during the pandemic	6	2.839	3.186	16. The reading activities sent to us are very tedious. 13. The reading activities sent to us are very extensive.	0.495 a 0.782
6. Skills for DE	5	2.423	2.722	24. I like to search for information to learn new things. 27. I search for information online to complement the topics we see in class.	0.425 a 0.639
7. Emotional experience during the pandemic	5	2.052	2.306	21. The way online activities are conducted has made me feel frustrated. 31. The way online activities are conducted has made me feel overwhelmed.	0.415 a 0.675
8. Institutional actions	4	1.779	2.022	25. The university has made adjustments to studying costs (e.g., tuition, exams, enrollment, etc.) due to the contingency. 23. The university has offered alternatives for those who do not have the resources to carry out the activities online.	0.547 a 0.811
9. Use of time	4	1.651	1.855	12. I have to spend a lot of my time caring for people who live with me (e.g., children, relatives, etc.). 11. I have to spend a lot of my time doing household chores (e.g., cleaning, cooking, etc.).	0.438 a 0.630

Fuente: Elaboración propia

The data shown in Table 2 demonstrate that both the factors yielded by the EFA and the CEEP have acceptable values in a global sense. Therefore, it can be assumed that the items are indeed correlated to the same construct.

Since each factor has a different number of items, in order to facilitate the comparison between them, it was considered appropriate to standardize the score of each factor to values

from 0 to 1. For each factor, an index was created, which was calculated from the sum of the items comprising it, divided by the maximum possible score for each factor, which was obtained from the product of the total number of items in the factor by the maximum score for each item (5, because each item was scored on a scale from 0 to 5). Table 3 shows the descriptive statistics for each component.

Table 2
Internal Consistency of Factors and CEEP

Factor	α
1. Quality of professor's role and practice	0.952
2. ICTs quality and accessibility	0.882
3. Satisfaction with DE dynamics	0.991
4. Disapproval of DE dynamics	0.833
5. Quality of didactic materials used during the pandemic	0.833
6. Skills for DE	0.706
7. Emotional experience during the pandemic	0.883
8. Institutional actions	0.776
9. Use of time	0.670
Global	0.943

Source: Own elaboration

Table 3
Internal Consistency of Factors and CEEP

Factor	M	SD
1. Quality of professor's role and practice	0.680	0.191
2. ICTs quality and accessibility	0.663	0.205
3. Satisfaction with DE dynamics	0.400	0.235
4. Disapproval of DE dynamics	0.552	0.231
5. Quality of didactic materials used during the pandemic	0.408	0.213
6. Skills for DE	0.758	0.171
7. Emotional experience during the pandemic	0.370	0.263
8. Institutional actions	0.447	0.277
9. Use of time	0.542	0.221
Global	0.536	0.124

Source: Own elaboration

In order to explore which DE-related elements were viewed more positively by the students, a Friedman test for related samples was performed. From the data presented in Table 4, it is possible to assume that some DE-related items were viewed more positively during the pandemic.

For example, it can be seen that the most highly rated element is related to the students' own elements, i.e., study habits, while emotional experience consistently received low scores from the students.

Discusión

The speed with which COVID-19 spread forced the taking of emergency measures around the world, and the decision to abandon education centers in favor of distance education was one of the actions mandated by most governments. Although this decision has been strongly criticized by different specialists (Van Lancker & Parolin, 2020; Skeikh et al., 2020), the reality is that, in places like Mexico, keeping all education institutions closed continues to be the strategy dictated by the

authorities. The urgent nature of this measure severely complicated its implementation, since, abruptly, millions of students and thousands of professors had to resort to ICTs to continue with their activities. In the face of this critical situation, it is a priority to have tools to evaluate the assimilation of the strategies used to continue with the educational practice, implemented to face what was considered a preventive, emergent, and provisional measure, but which has been extended to a new academic term and may possibly become the norm. This was the objective of the present study by developing and exploring the psychometric properties of the Questionnaire on Educational Experience during the Pandemic (CEEP).

The data reported in this study indicate that the CEEP can be a useful tool for exploring the experiences, perceptions, and emotions toward DE, forced on higher education students. At first, the instrument is slightly shorter than the original version proposed. Based on the results of the EFA, it was decided to eliminate 13 items whose factorial weight was less than 0.40. Thus, we have a questionnaire composed of 76 items distributed in 9 factors that relate various aspects

Table 4
Friedman Test for Related Samples

Factor	Average range
1. Quality of professor's role and practice	6.66
2. ICTs quality and accessibility	6.34
3. Satisfaction with DE dynamics	3.34
4. Disapproval of DE dynamics	5.36
5. Quality of didactic materials used during the pandemic	3.54
6. Skills for DE	7.42
7. Emotional experience during the pandemic	3.13
8. Institutional actions	4.12
9. Use of time	5.09
N	1441
Chi-square	3814.090
gl	8
p	< 0.001

Source: Own elaboration

that encompass the educational experience of higher education students during the pandemic. These factors cover aspects of access to ICTs, including the evaluation of teaching practice and educational material, institutional actions, and the emotional experience derived from this educational modality in times of pandemic. The factor loadings of the items in each factor, as well as the alpha values reported, allow us to assume reliability in the proposed dimensions.

In this sense, it is important to mention that, in the process of developing the CEEP, it was considered that the educational experience of higher education students could be defined on the basis of three broad aspects, namely the quality and access to ICTs by the students, the perception and assessment of the teaching practice and its adjustment to the new educational modality, and, finally, aptitudinal and emotional aspects of the students mobilized during the pandemic. Although the factorial structure yielded by the EFA reported in this paper is different from the one originally proposed, the overall internal consistency value reported (see Table 3) allows us to assume an underlying element in the questionnaire. Going back to that pointed out by Rogero-García (2020) regarding the absence of tools to evaluate the effects of the measures taken by the education system during the health contingency caused by COVID-19, the factors reported in this study can serve as a guide to explore and, eventually, improve the educational experience of the student body.

But what do the CEEP results say about the educational experience of the students surveyed? First, as Table 4 shows, the components that make up the CEEP were not valued in the same way. The factor that consistently scored most favorably was "DE skills," which refers to the ways in which students approach the academic contents in order to learn. This component is consistent with the concepts taken from the literature on the ideal profile of a DE student at the time of designing the CEEP. Although DE is an alternative for the democratization and flexibilization of education, as well as an opportunity for those who, due to geographic reasons, cannot access traditional educational centers (Castaman & Rodrigues, 2020; Contreras & Méndez, 2015), the truth is that

to thrive on this educational modality students require self-management, self-regulation, and achievement motivation skills to a greater degree than those studying in person (Contreras & Méndez, 2015; Vásquez & Rodríguez, 2007). A first concern about the forced transition to DE could be that such skills do not characterize the surveyed students. However, the data show that, regarding their study habits, self-management, and self-regulation, the participants considered that these were positively displayed during the pandemic. In further studies, it would be interesting to contrast this statement with the learning achieved during the pandemic.

A second element that was positively valued by the students was the "quality of the professors' role and practice." It is important to note that the elements grouped in this component refer to the appreciation of the effort and dedication of professors during the pandemic, as well as their willingness to adapt and incorporate new tools to ensure student learning. The literature on DE points out that one of the key requirements for this modality to work is teacher flexibility (Contreras & Méndez, 2015; Vásquez & Rodríguez, 2007). The data collected show that professors have attended this principle during the pandemic.

The third element that consistently received higher scores in the CEEP is "ICTs quality and accessibility." According to the results, participants reported that they had adequate electronic devices and few problems with Internet connection or access. These results are interesting, since, as mentioned at the beginning of the document, one of the most serious problems facing education during the pandemic is the digital divide that characterizes the country (Plá, 2020). It would seem then that the results of the study contradict those of other studies that insist on the barriers to ICTs access (Castaman & Rodrigues, 2020; J. García, 2007; Lloyd, 2020). However, behind these results, there may be an inherent bias in the way the data in the present study were collected. One of the most important limitations is that the study was conducted through a digital survey distributed by electronic means (i.e., e-mail, WhatsApp). For such reason, the process of information collection automatically excludes those who do not have

easy access to ICTs. This sampling error may be the reason why the study participants score positively in this aspect. It is also important to note that the items that make up these components do not explore ICTs skills or competence, only access to and quality of ICTs. This is another important limitation, since, as Román (2020) found, the adaptation and adequate use of these tools is an important barrier to success in DE. In subsequent studies, it would be valuable to consider the inclusion of items that adequately explore the aspect of digital competence, as well as to explore alternatives for analyzing the experience of students who do not have access to ICTs.

The results from the CEEP application show that the aspects that least characterized the student experience during the pandemic were positive emotional experiences (factor 7), satisfaction with the general DE dynamics (factor 3), and the quality of the didactic material used by the faculty during the pandemic (factor 5).

Starting with this last element, it is interesting that the quality of the teaching role and practice (factor 1) is one of the most representative aspects of the educational experience during the pandemic, while the didactic resources used by these professors are at the negative end of the ratings. It is important to highlight the difference between these components. In the case of the teaching role, what is recognized is the willingness and effort of faculty to adjust to the new demands, to remain in contact with students, and to address their doubts. The above is related to what Holmberg (1985, as cited in Verdún, 2016) called "didactic conversation," which refers to the fact that teachers and students maintain an active dialogue, which is considered as one of the fundamental characteristics of DE. On the other hand, the component alluding to the characteristics of educational resources focuses on the tools used by professors to teach. In this case, the overload of work, the low quality of the didactic material used, and, to a certain extent, the attempt to move from in-person class without modification to the virtual scenario are highlighted. In sum, these evaluations reflect that university professors did not have the necessary competencies to move to a distance modality. With all this, it is not surprising that the

participants expressed little liking and affinity for this educational modality. This, in turn, combined with a perception of an excessive workload unrelated to the contents of the subject, may be in line with the emergence of negative emotions such as frustration, anxiety, stress, among others.

It is interesting that, despite reporting the study habits necessary to succeed in DE, having professors who are making an effort to keep up their educational work in this atypical situation, and, above all, not lacking access to ICTs, the participants report negative emotions related to DE, teaching dynamics, and an absence of liking for this educational modality. The emergence of negative feelings towards school, as well as a lack of liking or affinity for the dominant educational modality, are elements that contribute to the loss of feelings of identification with the educational institution (Demagnet & Van Houtte, 2012). This, in turn, is an element that contributes to falling behind, which could turn into dropout, due to the lack of perception of academic achievement by students (Ballesteros, 2020; Didriksson, 2020; I. Sanchez, 2020), especially in people who already belong to vulnerable groups (Toribio, 2020).

While the results and their implications described so far are interesting, it is important to insist on the limitations of this study. As mentioned above, the sampling technique employed entails certain complications. Although the sample size is sufficiently large to assume a confidence level of over 95%, the participant selection procedure was by chance, and this reduces the generalizability of the results (Coolican, 2005). Likewise, the fact that the questionnaire was applied through a digital platform has at least two possible limitations: first, only those who have access to these platforms can participate in the study, which excludes an important sector of the population; and second, it is impossible to determine under what conditions the questionnaire was answered, or even if the data reported actually correspond to the study's target population. In future CEEP applications, sampling strategies should be designed to guarantee randomness in the selection of participants to have greater certainty in the results.

Another issue is the timing of the CEEP application. As mentioned above, the period of application coincided with the end of the first

academic term in confinement due to the COVID-19 pandemic. At that time, neither education authorities, teachers, nor students had a clear idea about what was happening, its duration, or even what to expect from this educational exercise. It would be interesting to apply the CEEP again to corroborate whether the educational experience has changed after concluding an academic term that began in this context with more time for planning and adjustment. Regardless of the above, the results of this first application are encouraging and motivate us to continue exploring and developing tools that allow us to know how students are responding to the demands of the new normal.

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