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Emergency remote teaching: student experiences based on the science of mind, brain, education

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Abstract: The aim was to co-construct the students' journey in their experience of emergency remote teaching and to analyze it in the light of the Science of Mind, Brain, and Education. This is an applied study based on the methodological framework of Design Thinking, carried out with nursing students. The results express the evaluation of the students' experience with emergency remote teaching, as well as categories of statements about learning during this period.

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Keywords: user experience; design yhinking; science of mind; brain and education.

Ensino remoto emergencial: experiências discentes fundamentadas na ciência da mente, cérebro e educação

Resumo: Objetivou-se co-construir a jornada do estudante em suas vivências com o ensino remoto emergencial, analisando-a à luz da Ciência da Mente, Cérebro e Educação. Trata-se de um estudo de natureza aplicada apoiado no referencial metodológico do *Design Thinking*, realizado com estudantes de Enfermagem. Os resultados expressam a avaliação da experiência dos estudantes com o ensino remoto emergencial, bem como categorias de falas sobre a aprendizagem nesse período.
Palavras-chaves: experiência do usuário; design thinking; ciência da mente; cérebro e educação.

Enseñanza remota de emergencia: experiencias de los estudiantes basadas en la ciencia de la mente, el cerebro y la educación

Resumen: El objetivo fue co-construir el recorrido del estudiante en sus experiencias con la enseñanza remota de emergencia, analizándolo a la luz de la Ciencia de la Mente, el Cerebro y la Educación. Se trata de un estudio aplicado basado en el marco metodológico del Design Thinking, realizado con estudiantes de Enfermería. Los resultados expresan la evaluación de la experiencia de los estudiantes con la enseñanza remota de emergencia, así como categorías de discursos sobre el aprendizaje durante este período.
Palabras clave: experiencia de usuario; el pensamiento de diseño; ciencia de la mente; el cerebro y la educación.

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1 INTRODUCTION

The changes that have taken place in the face of the Covid-19 pandemic have culminated in repercussions in the most diverse areas that interfere with human life (UN, 2020), so this reality was no different in the education sector. In this sense, to mitigate the effects of the pandemic on the sector, continuity of activities has been promoted through emergency remote teaching (BOZKURT; SHARMA, 2020).

Although emergency remote teaching was initially associated with distance education (EaD), there are clear characteristics that differentiate it and explain its adoption in the context of the pandemic. Among these, we highlight the use of educational technology, which, although effectively present in both, emergency remote teaching has undergone adaptations according to the reality at home, trying to minimize changes from what was usual in face-to-face teaching, with real-time classes, allowing greater interaction between student and teacher (HODGES et al., 2020). However, since this was an emergency situation, the sudden change in teaching methods revealed major difficulties for institutions that lacked preparation and prior planning, especially concerning equating the virtual workload with the presential workload, which is different from distance education, which has a macro model of pedagogical planning, with teacher training and planning of activities previously defined (SILVA et al., 2023).

Thus, the adherence to this modality in higher education has led the academic community to make its practices more flexible, with specificities and challenges inherent to this process, such as mastering different information resources and technological platforms, time management, planning flexible activities, connectivity, teacher training, among others (SUNDE; JÚLIO; NHAGUAGA, 2020; SOUZA, 2020; PEDROZA et al., 2021).

In emergency remote teaching, learning experiences were generally mediated through interactions on digital educational platforms, which required adaptations of pedagogical plans to achieve the activities and, consequently, the adoption of targeted, creative and innovative strategies to stimulate and monitor student participation and engagement and to ensure effective teaching-learning processes (FACHINETTI; SPINAZOLA; CARNEIRO, 2021). Therefore, the search for innovative solutions capable of qualifying students' experiences with educational services is fundamental, and there is an urgent need to map them to uncover difficulties related to teaching-

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learning processes and to design technologies that support better educational practices (SILVA; RANGEL; SOUZA, 2020).

Despite the strategic role of educational managers in formulating and implementing strategies to ensure the effectiveness of educational practices, Kalbach (2017) argues that understanding the user experience depends on the interaction between the different actors who interface with the services used, and not only the managers in charge of implementation. Therefore, understanding the experiences of students in this modality is relevant and necessary, as possible impacts can be visualized, allowing a proactive and strategic rethinking of educational practices in the face of new emergency contexts.

In the context of higher education in Nursing, the implementation of Emergency Distance Teaching in Higher Education Institutions (HEIs) initially took place by slowing down activities (LIRA et al., 2020), due to the practical nature of the curricular components that require in-service execution; combined with the redesign of teaching proposals to achieve the objective of distance teaching and to include Information and Communication Technologies (ICTs) in its processes (SILVEIRA et al., 2021). As a result of this implementation, numerous experiences have been made by students, but it is worth asking to what extent expectations and perceptions have converged with the institutional proposals implemented, opening up possibilities for better alignment in the provision of educational services, in the face of possible catastrophic situations that may arise in the context of higher education.

Considering that users' expectations are standards or reference points that they bring to the service experience, often consisting of what they believe should or will happen; and that perceptions consist of subjective evaluations of users' experiences, which refer to how they perceive, evaluate quality, and how satisfied they feel concerning a given service (ZEITHAML; BITNER; GREMLER, 2014); it is assumed that: students' experiences must be aligned between their expectations and perceptions and the educational services they experience, at the different meeting points of this journey. Mapping these experiences helps to formulate strategies for effective teaching-learning processes, as it provides lessons learned from students' experiences. This way, understanding these experiences is essential for a university that wants to provide quality educational services and guarantee better teaching-learning processes.

From a neuroscientific point of view, this understanding is fundamental because it allows us to reveal future stimuli for the individual that are directly related to learning and that support better educational practices (TOKUHAMA-ESPINOSA, 2011; 2018). The theoretical framework of the

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Science of Mind, Brain, and Education (SBME) finds opportune support for this understanding. Conceived by Tracey Tokuhama-Espinosa, CMCE seeks, among other perspectives and through the articulation of cognitive psychology, neuroscience, and education, to investigate premises that, although they vary from person to person, have scientific support that allows us to elucidate how they influence learning processes (TOKUHAMA-ESPINOSA, 2011; 2014).

Although contemporary literature presents results experienced with Emergency Remote Teaching in terms of aspects that influence student learning, among those found in the search conducted, no studies were found that address this subject in the light of CMCE. In addition, it is postulated that there are gaps in the relationship between Emergency Remote Teaching and student learning since the formulation of current educational policies is not always guided by educational requirements within the framework of pedagogical science, but by the logic of neoliberal market services (ECHALAR; LIMA; OLIVEIRA, 2020). Therefore, it is necessary to study the experience of emergency remote teaching from the perspective of the university students themselves and in the light of evidence that allows us to glimpse possibilities for the future of transpandemic education.

Thus, it is postulated that research on the triad of students' experiences with emergency remote teaching, transpandemic education, and the science of mind, brain, and education is important because the research results can favor the planning of managerial and pedagogical actions in favor of implementing and maintaining a culture of innovation and quality in higher education institutions within the framework of pedagogical science. In addition, the results can contribute to the identification of mechanisms that promote the formulation, implementation, and development of best practices in teaching and learning processes in higher education.

Based on the above, the question that guided the development of this research was What were the experiences of university nursing students with emergency remote teaching in the light of CMCE? To answer it, we aimed to: Co-construct the students' journey in their experiences with emergency remote teaching, analyzing it in the light of CMCE.

2 METHODOLOGY

This is an applied study, since it allows the production of knowledge to solve problems in their practical application, based on the principles of experience mapping and design experimentation approaches (KALBACH, 2017). Design thinking was adopted as a methodological reference, as this approach allows the expression of ideas in a way that they can be absorbed and complemented by the

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people who experience them at the moment of conception (VIANNA et al., 2012). In general, design experimentation approaches allow the analysis of problems in a context to develop solutions, with the information generated being an integral part of the tools and techniques applied and mediated by stakeholders - groups of people who are somehow involved and intervene in the user's relationship with the solution created (GRANT, 2019).

The study was conducted with undergraduate nursing students from a federal public higher education institution, located in the Midwest region of Brazil. For the data collection, the inclusion criterion was that they were at least 18 years old, regularly enrolled in the course, and had experienced emergency remote teaching for at least one semester. As an exclusion criterion, it was decided not to contact students who were absent for any reason during the data collection period.

The operationalization of Design Thinking requires a human-centered vision, and it is essential to think about and solve practical problems through empathy, collaboration, experimentation, and making thoughts and processes tangible to design innovative solutions (VIANNA et al., 2012). The challenge is to enable those involved in experimentation to see through the lens of design, to put themselves in the shoes of a "problem solver" (designer), and to think like one (BROWN, 2010).

In its operationalization, the stages do not necessarily have to be taken in the same order and/or form but are essentially made up of three moments: inspiration, ideation, and prototyping. To strategically reach these moments, we used the Double Diamond model created by the Design Council in Great Britain, named for the structural similarity of its six stages that systematize two diamonds (Figure 1), namely: understanding, observation, definition, idealization, prototyping and testing (DESIGN COUNCIL, 2011; PINHEIRO; ALT; PONTES, 2012).

Figure 1 - Schematic of the double diamond process

Source: Elaborated by the author, based on the Design Council model, 2011.

The moment of **inspiration** in Design Thinking comprises the stages that structure the first diamond, since this is where we get closer to the context of the problem, the stakeholders and the end user, gathering insights and defining the project, challenges and mapping user needs in the real context (BROWN, 2010; VIANNA et al., 2012; PINHEIRO; ALT;

PONTES, 2012).

The first stage, **understanding**, consisted in recognizing the context of the project to be developed (DESIGN COUNCIL, 2011; BROWN, 2010), and to this end, we sought to understand the expectations and perceptions of nursing students about emergency remote teaching. Therefore, using a quantitative approach, we applied the Service Quality - SERVQUAL psychometric scale, validated and widely used in Brazil for service evaluation research. It is an instrument to measure **service quality** from the user's perspective and covers the areas of service quality through five dimensions: tangibility, reliability, responsiveness, assurance, and empathy (ZEITHAML; BITNER; GREMLER, 2014).

Divided into two sections on a 7-point Likert scale, SERVQUAL aims to: I) measure the user's general expectations of what they consider to be the ideal service, ranging from "totally unimportant" to "totally important"; II) and assess the user's perception of the service received, weighting the items from "totally disagree" to "totally agree".

For this study, the translated version of the original instrument was used, adapting it to the specificities of an educational service in emergency remote education. An electronic form was used in January and February 2022, sent by email and/or instant messaging group, and included the Informed Consent Form (ICF), a sociodemographic characterization form, as well as the SERVQUAL items.

The quantitative data generated were tabulated in a Microsoft Excel® spreadsheet and analyzed to measure GAP 5, which is the difference between what the customer expects and what the company delivers (ZEITHAML; PARASURAMAN; GREMLER, 1990), using the service quality model for each dimension. Descriptive statistics were used to analyze the data, calculating measures of position and dispersion.

In the second phase, **Observation**, we sought to expand the understanding of the issues and factors that influence and/or refer to the experiences of university nursing students with emergency remote teaching. Therefore, a **qualitative approach** was adopted to describe aspects of the social reality of these participants, seeking meanings and phenomena that encompass them (MINAYO; COSTA, 2019). To this end, interviews were conducted using the Critical Incident Technique (CIT) proposed by Flanagan (1973), which aims to understand the subjectivity of individuals through their statements. The technique takes into account the range of results it provides in terms of behaviors, situations and consequences, both positive and negative, related to the object under study, as well as the possibilities for intervention (FLANAGAN, 1973).

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The interviews were conducted remotely, from February to April 2022, using the virtual platform Google Meet, given the context of social isolation generated by the COVID-19 pandemic, and lasted an average of 22 minutes. The interviews followed the script of a research protocol developed by the research group, as proposed by ICT, and were recorded after the authorization of the participants, who expressed their consent in a specific ICF for this phase. The interviews were transcribed in full, coded according to the order in which they were conducted, and subjected to manual thematic content analysis (MINAYO; COSTA, 2019), guided by the stages of pre-analysis, exploration of the material, treatment of the results, which were interpreted in light of the CMCE (TOKUHAMA-ESPINOSA, 2017).

In the **definition phase**, the viewpoints on the problems were established based on the findings of the previous phases, the data collected were synthesized and structured, and the initial challenge was redefined (BROWN, 2010). To this end, meetings were held among the research team to triangulate the data produced, experimenting with tools to generate hypotheses that would define personas. Personas are hypothetical archetypes of real users, defined with considerable rigor and precision, based on the synthesis and grouping by affinity of the data present in the research (NUNES; QUARESMA, 2018), in other words, representations created based on identified patterns (ADLIN; PRUITT, 2010). Thus, two persona hypotheses were postulated.

During **ideation**, ideas, and concepts were conceived, generated and prototyped to find solutions to the diagnosed problems (BROWN, 2009). A co-creation workshop was then set up with the participants. For each stage of the workshop, there were three face-to-face meetings of 2 hours each. First, in the **ideation phase**, the creative process was stimulated, to explore possibilities for expanding the idea through co-creation techniques in constant interaction with the students, to create alternatives that would converge into something tangible. Together, they designed solutions to the problems identified, focusing on reducing weaknesses and improving learning.

Therefore, experiments were proposed to encourage the creation of personas according to the structured hypotheses and following the model created by the research team, with each group creating a persona for each hypothesis, exposing and categorizing them according to their experiences. The participants were divided into two groups and, after presenting the data resulting from the understanding and observation phases, as well as the hypotheses that outlined the personas, they were encouraged to visualize themselves in these personas and to present their experiences and peculiarities in more detail.

Finally, after the analysis and selection of solutions, the **prototyping phase** took place, in

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which constant experimentation was carried out to (re)create opportunities to adapt and improve the proposed solutions. In the second session of the co-creation workshop, the user journey was mapped based on the personas created in the first session (BROWN, 2010).

The user journey is a relevant artifact in research to assess the quality of services, as it shows the trajectory of the persona at the different meeting points, positive, negative, and neutral moments, possibilities for engagement and improvement for long-term relationships, and allows to visualize the users' experiences, as well as feelings, motivations, and behaviors (MARTIN; HANINGTON, 2012; NENONEN; RASILA; JUNNONEN, 2008). Thus, the established groups built the mapping of the nursing students' journey based on the personas created and the exposure in detail of how much they saw themselves in the mappings developed to schematize the prototype of the artifact produced (DESIGN COUNCIL, 2011; PINHEIRO; ALT; PONTES, 2012).

The final stage, **Testing**, allowed the prototype created to be used to evaluate relevant information for validating the trip, such as: positive and negative points, doubts, and new ideas (BROWN, 2010), by combining the mappings developed by the participants. The SCAMPER evaluation tool was applied in a round table discussion, which explores the facts based on their acronyms and questions: S-C-A-M-P-E-R (replace, combine, adapt, modify, put to other uses, eliminate, and rearrange), which allows the redefinition of a product (MICHALKO, 2006).

The research is linked to the matrix research project entitled Science of Mind, Brain and Education in the proposition of Better Nursing Teaching Practices in clinical learning environments, which was approved by the Research Ethics Committee, under number: 29140120.7.0000.5541, and had the consent of the participants at each stage undertaken..

3 RESULTS AND DISCUSSIONS

Chart 1 shows the results of the quantitative survey assessing the students' experience of emergency remote teaching using the SERVQUAL scale. The scale was applied to 159 nursing students, 86.8% female and 13.2% male, aged between 18 and 48 years. The results were structured according to the five dimensions of service quality included in the instrument, and the mean scores for expectations and perceptions in each of the dimensions were presented. From this average, the average GAP was presented, which illustrates the gap between perceptions and expectations in relation to the experience of emergency remote teaching.

Chart 1 - Quantitative data results - application of the SERVQUAL scale (n=159)

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Dimensions	Definition	REM (%)	RPM (%)	RGM (%)
Tangibility	Appearance of physical facilities, equipment, people and communication materials	**34,46**	**27,3**	**-7,16**
Reliability	Ability to carry out the service reliably and accurately.	**37,32**	**28,31**	**-9,01**
Promptness	Willingness to serve customers and provide fast service.	**36,93**	**29,60**	**-7,33**
Security	Knowledge and courtesy of employees and ability to convey confidence and security.	**37,81**	**29,81**	**-8**
Empathy	The care and personalized attention offered to its clients.	**35,69**	**29,02**	**-6,67**

(Average Expectation Results (REM), Average Perception Results (RPM) and Average GAP Results (RGM) - **Source**: Elaborated by the author. Brazil, 2022.

The tangibility dimension had the lowest percentage of any of the other dimensions evaluated, both in terms of expectations (34.46%) and perceptions related to the use of the service (27.3%). This dimension takes into account, among other things, physical facilities, equipment, people, and communication materials, and the GAP of -7.16% highlighted the need to invest in improving the communication materials, physical facilities, and equipment used.

Concerning the reliability dimension, which concerns the ability to provide a service as promised with confidence and in the correct manner, a GAP of -9.01% was demonstrated, with the greatest discrepancy between expectations (37.32%) and perceptions (28.31%) assessed, as well as the worst GAP among the five dimensions assessed. Investing in resources and improving the skills of HEI employees to provide services reliably and accurately proved to be fundamental, as in other studies (OLIVEIRA; FERREIRA, 2008), reinforcing the view that if the service provided does not keep its promises, users are unlikely to use the service again (ZEITHAML; BITNER; GREMLER, 2014).

Promptness is understood by users as the length of time they have to wait for help, answers, or attention, as well as the standard of speed of responses, reflecting the institutional view of willingness to help. This dimension showed a GAP of 7.33%, which is not good for the criteria evaluated, and shows that there are gaps in the provision of services quickly and efficiently, which affects the quality of teaching in the Nursing course. These results allow us to consider that, to control these lapses, it is essential to raise awareness through permanent.

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Concerning expectations (37.81%) and perceptions (29.81%) about the safety of the service, which resulted in a GAP of -8%, it was found that aspects related to the knowledge and courtesy of the staff, as well as the ability to inspire trust and courtesy, were poorly evaluated, which can lead to a negative aspect in the choice of a university, especially in aspects related to learning, and is also demonstrated in other studies (FERREIRA; SADOYAMA, 2015).

Finally, in the empathy dimension, which refers to the attention given to the user, the best results were obtained for expectations (35.69%) and perceptions (29.02), while the lowest GAP obtained was -6.67%. Thus, although expectations were higher than perceptions, these students felt understood, treated in a personalized manner, and felt important in their experience with Emergency Remote Teaching, which is also perceived in other studies (CHACON et al., 2022).

The results of another study, in which they point out that the evaluation of the quality of the service provided by a university in a context of uncertainty, without previously trained professionals, in addition to the lack of structure of the institutions themselves, reinforce that the criteria evaluated in SERVQUAL favor greater attention to aspects that touch on the quality of teaching in emergency remote teaching (FERREIRA; SADOYAMA, 2015).

The qualitative data included 22 participants at this stage, 81.81% female and 18.18% male, with an average age of 23 years. The analysis was presented by grouping the speeches of the subjects (represented by the letter A), in which they were represented based on the learning premises proposed by Tokuhama-Espinosa (2014; 2017), into axes according to the affinity/context of each premise, resulting in five learning axes, summarized in Chart 2 below:

Chart 2 - Expression of statements and assumptions in the interviews

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Learning axes	Assumptions	Connotative meaning	Illustrative speeches*
1 - Teaching and learning	Attention; Learning is cyclical, not linear; Feedback and Relevant and meaningful contexts	Connotes the idea/truth about the particularities surrounding the learning cycle	*I feel that my attention has been affected, I've had trouble concentrating because of the noise and the demands of family members. With very long classes and exams, the next semester would arrive and we'd think we'd learned, but we'd have to keep remembering and re-studying because of teachers who only read the slides, didn't give us any lessons, attention or feedback." A - 02, 03, 05, 06, 07, 08, 09, 10, 11, 14, 20, 21, 23, 24*
2 - Learning stimuli	Motivation; Challenge and threat; Conscious and unconscious processes; Learning is developmental as well as experiential; and Novelty and patterns	Conditions that represent individual stimuli that are directly linked to whether or not it is easy to learn	*"I had no motivation to log on to the AVA, watch 50 classes and not even see the teacher's face, not even know what he looked like. It was very challenging to have to adapt to this teaching that lasted much longer than we expected, to learn how to use the AVA, despite the system being very useful, I saw that it worked, you know, it wasn't something in vain, we weren't wasting time."A - 01, 02, 03, 05, 06, 09, 11, 13, 14, 15, 16, 20, 21, 23*
3 - Interactions	Facial expressions; Tones of voice, and Social interactions	The sentences concern interactions, which have an impact on the learning process	*"Often the teachers are rude to us, so we're afraid to talk to them.[...] I thought I'd have more support from the teachers, mainly because they also feel alone like we do, and I think that was a bit lacking." - 01, 02, 03, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24*
4 - Body and brain	Body and brain; Sleeping and dreaming; Nutrition; Physical activity and Use it or lose it	Talks about the body and the brain, and their impact on teaching.	*"The week I had Covid-19, I was practically only able to attend class and it took me, I don't know... a lot more hours than normal to do an activity that I used to do in half an hour. So it slowed down my learning process, but thankfully I managed to recover and now everything is fine."A - 02, 07, 08, 09, 13, 15*

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5 - Mind and emotions	Emotions and cognition, Stress, Anxiety and Depression	Meeting points regarding emotions and feelings and their interference in teaching	*"It caused a bit of frustration, because I ended up doing a semester that had subjects I had been waiting for for a long time and I didn't want to do them in this format, I really wanted to have the theory in person. I became much more distracted and stressed, [...] with the amount of things they were demanding. A - 01, 02, 03, 05, 06, 07, 08, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22*

Source: Elaborated by the authors, 2022. Cuiabá-MT. ***Translated from Portuguese by us.

Learning is influenced by various factors, but what motivates one student may not motivate another. Tokuhama-Espinosa (2017) points out that there is no learning without attention; however, attention alone is not enough for complex learning, and it is necessary for memory to work together, allowing for going back and forth to reinforce knowledge. Feedback and meaningful processes also influence learning outcomes, although the degree of influence varies from situation to situation.

Considering a context of challenges and threats, in which a given situation may or may not lead to different reactions for an individual, it is known that the brain looks for patterns and novelties to make its associations, and each person's experience interferes with cognitive development, and attention is needed in this regard, as it is directly related to the quality of teaching provided by the group studied here. This perspective indicates the impairment of health in learning since a well-oxygenated brain can improve attention compared to a brain deprived of oxygen (TOKUHAMA-ESPINOSA, 2017; 2014).

Likewise, interactions in general directly interfere with or influence learning, just as the brain depends on social relationships, tone of voice, and facial expressions are important for learning (TOKUHAMA-ESPINOSA, 2017). Human interactions, especially in the period in question, are seen as empathetic, on both sides and facilitate learning by serving as a subsidy for other premises already mentioned here, since they are not independent, in addition to being linked to school failure or success, a point that deserves attention from professionals involved in the process (LEONARDO et al., 2019).

Emotions can positively or negatively influence learning, depending on culture, knowledge, and the experiences each person has had in his or her life (TOKUHAMA-ESPINOSA, 2014), and not all stimuli lead to the same affective state for all people. In this sense, changes in emotions and stressful situations evoke neurotransmitters that do not contribute to learning, but are essential for recognizing patterns and making decisions (TOKUHAMA-ESPINOSA, 2017; 2014; ALMEIDA, 2022; SANTOS et al., 2020), as seen in the participants' statements about their experience with

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emergency remote teaching.

The co-creation workshop was attended by six students, three female and three male, aged between 20 and 23 years. Based on this, a user journey map was structured with the participants, following the time axis of their experience: before, during, and after the emergency remote teaching, to reliably elucidate their experience with this teaching. As the literature shows, the mapping of this journey is a relevant and necessary artifact, as it contributes to the understanding of the real needs of the user (KALBACH; 2017).

The study showed that the experience of the nursing student who witnessed the emergency remote teaching can be translated into a persistent, proactive and resilient persona, open to new experiences and motivated by the active methodology presented. These findings corroborate the literature on CMCE, which assures that learning must be collaborative and facilitated with the use of new technologies, not linear. Therefore, learning in this modality must take into account the conscious and unconscious processes and previous experiences of each individual, being personalized for the student and not for the teacher (TOKUHAMA-ESPINOSA, 2017; 2014).

From this mapping, it was also found that students obtained some learning from the novelty of the educational environment presented to them, considering that for the brain, the detection of the new is one of the main ways to prepare for threats and challenges that may arise for possible divergent situations, and also to learn more about their context (TOKUHAMA-ESPINOSA, 2017; 2014;). When conducting activities at a distance, it can be difficult because students tend to identify the most relevant information and maintain their concentration on the activity.

On the other hand, the journey based on the experiences of nursing students had pain points, limitations and impasses similar to those found in other studies: insecurity with the quality of the teaching they experienced, difficulties in reconciling the studies with their family context, presenting anxiety and adversity in their learning, as well as the durability and use of emergency distance teaching that lasted longer than expected (SANTOS et al., 2020; AMARAL; POLYDORO, 2020; SILVEIRA et al.; 2021).

In addition, according to the mapping done, students point out that teachers did not always provide feedback on their development, even if they were sometimes empathetic. Feedback on students' learning progress, as well as the type and frequency with which it occurs, influences learning outcomes and is one of the sources of learning (TOKUHAMA-ESPINOSA, 2017; 2014).

This reinforces that teachers play a crucial role in helping students to understand and provide an environment for learning growth and personal development since learning happens when you are

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aware of what you don't know, highlighting the need to be aware of relevant information that enhances this process (TOKUHAMA-ESPINOSA, 2017; 2014).

Interaction and the relationship between the mind and emotions were the learning premises that stood out the most, reflecting the importance that students believe they have and are the points that have the greatest impact on their teaching and learning process. They are clear that the teacher is the main promoter of the development and application of interactive practices that make knowledge possible in an easy, enjoyable, and creative way, as well as being fundamental in stimulating self-learning based on knowledge of the strategies that facilitate each person's learning.

4 CONSIDERATIONS

Mapping the student experience requires assessing several factors to understand their needs. In this way, learning about users' expectations and perceptions is essential for educational managers to know the reference points and improve the quality of the services provided. Evaluating the students' pain when they encounter the educational service provided means paying attention to the factors that enhance/hinder the learning process.

Initially, the expectations of the nursing students were high, but the perception was lower than expected, illustrating an important point to be re-evaluated, since the implementation of such a teaching modality may be necessary again. In addition, knowing the impact of emergency remote teaching can tell us a lot about the quality of teaching in the presential format. Creating a map of the student journey is relevant for institutions and service users, as it allows them to understand their contexts and experiences and to promote targeted changes about their real needs.

Understanding the factors that influence this type of teaching allows teachers and students to find better practices that enhance learning, as well as improve the way they learn and teach, making this process personalized. Paying attention to the individuality of a given audience, and practicing empathy and social interaction during an atypical period facilitates the process, as well as favoring the implementation of active teaching approaches that are more interactive and provide greater stimuli for learning in emergency remote teaching.

In the field of research, this study suggests further work on students' experiences with educational changes in higher education, considering that their experiences play an important role in the formulation and implementation of strategies to improve teaching-learning processes, and the student as the center of the strategic process, as the end customer who uses educational services. It is

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also appropriate to study the implications of these changes for the future of transpandemic education, to identify the potential and limitations of educational trends and innovations.

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