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COVID-19, Didactic Practices, and Representations Assumed by Preservice Teachers at Universidad Técnica del Norte-Ecuador

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Abstract: As an alternative for university students to continue their professional training during the COVID-19 pandemic, higher education institutions implemented virtual learning modalities. In this context, it was proposed to determine the social representations assumed by university students who are pursuing their studies as future educators. It is presumed that representations related to didactic practices are composed of content (knowledge, skills, and attitudes) and organization (central core and representational system). This is an ethnographic study, with an available nonprobabilistic sample of 227 students from the primary education major at Universidad Técnica del Norte. Verbal association techniques and documentary research were used for information collection. To analyze the data, the IRaMuTeQ software (R interface for texts and questionnaire multidimensional analysis) was used. Two types of analyses were conducted: hierarchical classification and factorial correspondence. In conclusion, a virtuality with difficulties and a careful and responsible face-to-face modality are expressed as meanings associated to the representations, both of which require qualitative changes. Regarding the organization, didactic practice complementarity is assumed to be integrated in a hybrid learning modality.

Keywords: COVID-19; POS-COVID-19; didactic practices; social representations; verbal associations; virtual education



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1. Introduction

Contemporary society assumes that education is a task assigned as a priority to educational institutions and that its process strictly requires specific content knowledge, application of methods, and the use of a variety of resources. This way of thinking is limited, based on the findings from some of the best educational systems. In Finland, the relevance of interconnection and feedback between three subsystems considered essential: school, family, and socio-cultural [1] has been demonstrated. Educators, beyond knowing the content, using a variety of resources or multiple methods, techniques, and instruments, must link other agents and educational contexts so that their students understand what they are being taught [2].

On the other hand, COVID-19 was a pandemic that impacted all spheres of human ways of living, even more so in education. For students to continue their training, school education relied on the use of technology integrated into virtual learning environments (e-learning platforms, websites, blogs, wikis, chats, social networks, and digital applications).

As an opportunity to improve the understanding of educational practice and advance in the generation of pertinent initiatives, it was proposed that the representations internalized by primary education preservice teachers should be analyzed, specifically in relation to the virtual learning modality that was implemented for approximately two years during the pandemic. In this regard, several studies have reported both positive and negative results.

For the positive results, it has been evidenced that virtual learning, among other things, allowed the continuity of didactic processes, and that this alternative became a

valuable tool for students to access knowledge [3]; it provided an opportunity to reorient the role of traditional teachers and, with it, the reinvention of digital methods, resources, and lessons [4–6]; it assisted training in digital environments implemented by educational institutions as a significant effect on the teaching–learning activity [7–11]; it gave access to other didactic experiences as a result of the links generated between virtual communities, some of them in other countries and continents [12,13]; it allowed active participation of students in gamified flipped classrooms [14], giving teachers an opportunity to digitally transform classrooms into spaces where students can think, feel, and act differently [15–18]; and over all, it stimulated curricular reflection to develop global awareness with an emphasis on ecological thinking and preparation to face other complex global problems [19].

With respect to the unfavorable results of implementing virtual education, the following have been found: dissatisfaction with the quality of virtual learning interactions [12,20,21]; emphasis on memorization, passive learning, and reduction in practical learning [3,22]; increase in educational inequalities as a result of the digital gap that limits the access of students in economically precarious conditions, immigrants, and other ethnic groups [3,8,12,23–26]; perception of a limited development of digital skills [27,28]; fatigue, stress, and a new type of weariness resulting from synchronous and asynchronous interactions via zoom, Microsoft teams, and Google Meet [3,29]; commotion caused by fake news and hate speech via social media [30–32]; a feeling of excessive regulation, control, and even criminalization of teaching practice [3,12,33,34]; and, the loss of individual privacy, generated by a new digital ecosystems dependance supported by artificial intelligence [35–37].

As the cited studies reveal, advantages and disadvantages of virtual education have generated interest in the international scientific community. Hence, locally, the following questions have been considered: What are the representations of didactic practices assumed by primary education students, before and after the COVID-19 pandemic? What didactic strategies will support comprehensive learning in students who are part of a primary education major?

2. Materials and Methods

This was an ethnographic study that focused on the understanding of didactic representations in the context of COVID-19, assumed by students who are studying to become primary education teachers. Verbal association techniques [38] and documentary research [39] were used to collect the information. For data analysis, the IRaMuTeQ software (R interface for texts and questionnaire multidimensional analysis) was used. Two types of analyses were derived from it: hierarchical classification and factorial correspondence.

The study population consisted of 263 students from the primary education major at Universidad Técnica del Norte (UTN); from this population, 227 students decided to collaborate voluntarily. This study was approved by UTN's Research Department (N° UTN-CI-2022-023-R), and it was developed in accordance with the code of ethics guidelines of the institution [40]. Students who voluntarily participated in this research agreed to sign a written informed consent to guarantee their confidentiality and anonymity. Table 1 summarizes the sample distribution.

Table 1. Distribution of the sample.

	Sex		Ethnic Self-Identification				Place of Residence		
	Female	Male	Mestizo	Indigenous	Afro Descendant	Other	Urban	Rural	Peripheral
Frequency	178	49	189	33	3	2	137	81	9
Percentage	78.4%	21.6%	83.3%	14.5%	1.3%	0.9%	60.3%	35.7%	4%

The study was developed in four stages: development of the instruments, collection of data, data analysis, and triangulation of results.

2.1. Stage 1: Development of the Instruments

Two research instruments were developed: a verbal association test and Specialized Analytical Summary (SAS) sheets.

The test was designed to identify and bring out the constituent elements of didactic representations (contents and organization). A comparative semantic field was established at two moments: before (COVID-19) and after (POS-COVID-19). To determine the didactic content [41], students were asked to freely associate three inductive terms: ideas (knowledge), procedures (skills), and feelings (attitudes). On the other hand, for organization (central core and representational web), three indicators were established: frequency, range of appearance, and importance.

The SAS sheets were designed as an Excel matrix to extract the theoretical framework that supports and justifies the research. Scientific articles available at WoS (Web of Science) and Scopus databases, as well as books in printed format, were used.

2.2. Stage 2: Collection of Information

All data collection was developed during the June–December 2022 period. The recordings of verbal production with students were carried out in person from June to July. Documentary analysis of scientific articles and books was conducted during the August–December period. To search for the articles, the following filters were applied: language (papers originally published in English) and year of publication (documents published between 2019–2023). With regard to the books (printed on paper) used in this research, only publications in Spanish from 2014–2022 were considered.

The search string for the topic was configured as follows: (“education” or “virtual education” and “COVID-19”). A total of 410 documents found in Web of Science (WoS) and 214 in Scopus databases resulted from a preliminary search. After reading and analyzing article abstracts, 26 papers from WoS and 18 from Scopus were selected. In addition, 18 printed books related to the topic were also chosen.

2.3. Stage 3: Data Analysis

The process consisted of gathering representation contents and organization assumed by the students. The content refers to knowledge, skills, and attitudes; organization refers to the internal structure and central core. The IRaMuTeQ software (R interface for texts and questionnaire multidimensional analysis) was used to analyze the data. Two types of analyses were performed: hierarchical classification and factorial analysis of correspondence. A plan, shown in Table 2, to collect the data was prepared as the first step of the analysis.

Table 2. Model for the collection of representations.

COVID-19, Didactic Practices, and Representations																
Informative Data							Before				After					
							Contents		Organization		Contents		Organization			
Participant	Level	Sex	Ethnicity	Age	Area	Province	Knowledge	Skills	Attitudes	Words (Frequency)	Importance Range of (appearance)	Knowledge	Skills	Attitudes	Words (Frequency)	Importance Range of (appearance)
			Mestizo	23	Rural	Imbabura	Virtual classes	Self-learning	Sadness	Use of technology	1	Efficiency	Dialogue	Tranquility	Live together	2
15	First	Male									Positive					Neutral

The matrix has 4 rows and 19 columns. Basically, it includes two components: informative data and COVID-19—didactic practices—and representations. The informative data column is divided into seven subcolumns. The first one contains a code that identifies each participant; the following columns show information related to level of their major, sex, ethnic self-identification, age, area, and province of residence. The column that indicates information related to COVID-19, didactic practices, and representations is organized according to temporality: before (COVID-19) and after (POS-COVID-19). Each of these moments is divided into content and organization. The didactic contents are labeled in three inductors (knowledge, skills, and attitudes), and the organization component is divided into three subcolumns based on the associations themselves, the rank (associative priority assigned), and its importance or assessment (positive, negative, or neutral).

To reduce the bias in the analysis, the matrix was revised, so typing and spelling errors were corrected both in the instruments answered by the students and in the collected conceptual corpus. Subsequently, similarity trees, dendrograms, and prototypical analysis matrices were elaborated by using the IRaMuTeQ software. When a term is more frequent than others, the computer program represents it with larger letters; likewise, thicker lines reveal greater co-occurrence between words.

2.4. Stage 4: Triangulation of Results

For data triangulation, three elements were taken into account: (1) didactic practices and representations obtained from students, (2) results disclosed in scientific articles, and (3) understandings and/or interpretations narrated and consigned in academic–scientific texts.

3. Results

The results are presented considering the two dimensions of representations: content and organization. Findings of the didactic contents are represented in the form of similarity networks. On the other hand, the results referring to the organization that seek to determine the central core and the representational web are presented in correspondence factor analysis matrices.

3.1. About the Didactic Contents

It is necessary to clarify that the didactic dimensions of the contents considered in this study (knowledge, attitudes, and skills) are associated with the four pillars of education: learning to know, learning to do, learning to live together, and learning to be [42].

3.1.1. Knowledge and Didactic Practice in the Contexts of COVID-19 and POS-COVID-19

Six lexical classes are shown in Figure 1, (referential content and meaning associated with social representation). “Virtuality” appears as the core of the central class, and it is articulated with five more lexical classes, three of them closely related: difficulty, failure, and does-not-answer; two classes are away from the central class: stress and personal care. Discursively connected to the core class is “virtuality”, for which 28 terms appear. Linked by thicker lines, due to their semantic proximity, the following words stand out: self-study, technology, limitation, virtual education, and delay. Based on frequency, the following terms stand out: personal-care, stress, adaptation, fear, and difficulty. Careful virtuality in a context of stress and difficulty is associated as a relevant idea.

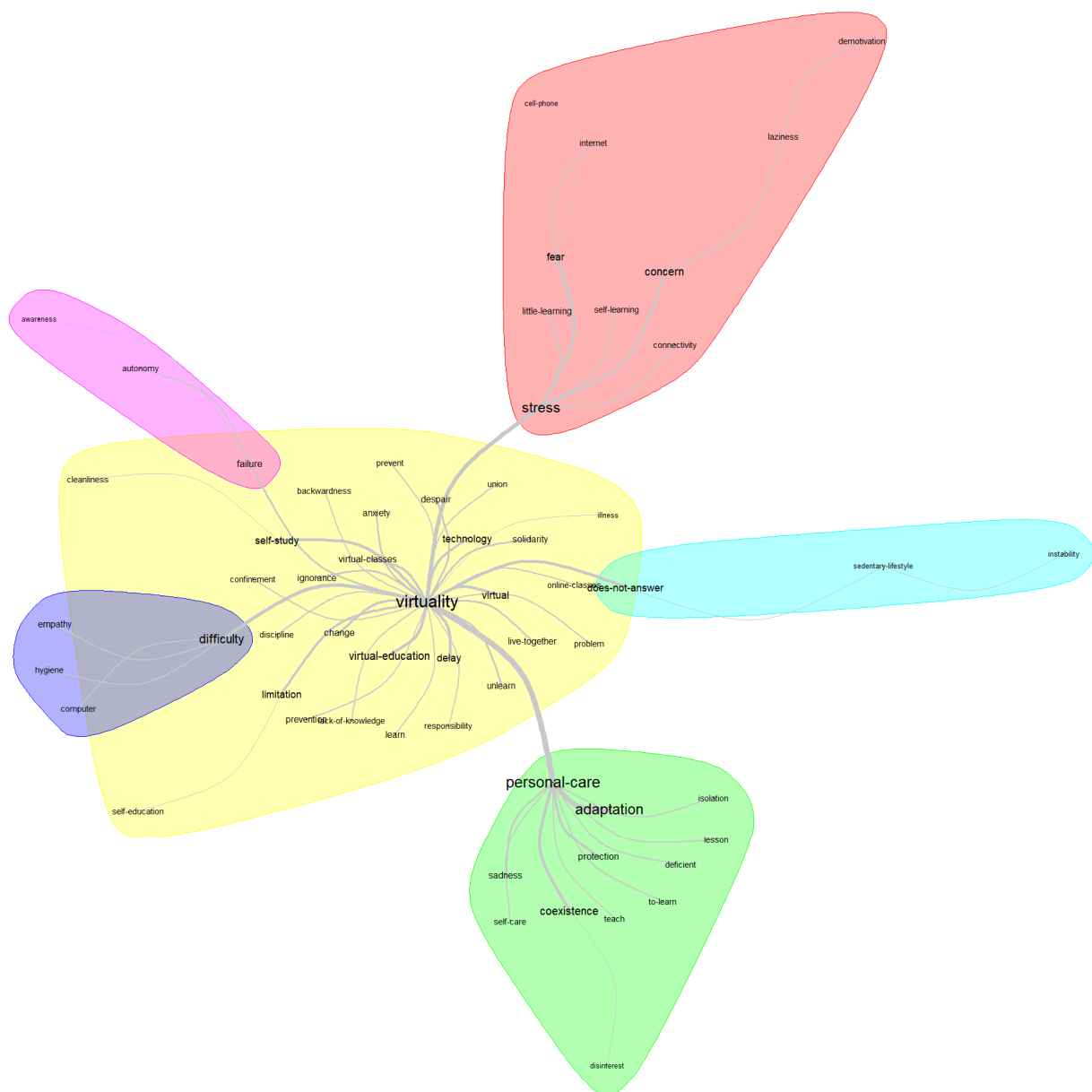


Figure 1. Similarity network: knowledge related to COVID-19 and virtual didactic practice.

Figure 2 shows a network of similarity related to the didactic practice in times of POS-COVID-19. In the core zone, the lexical class “*personal care*” prevails. This articulates ten more classes: *responsibility*, *caution*, *coexistence*, and *socialization*, in a close way. As a secondary meaning: *face-to-face*, *learn*, *happiness*, *adaptation*, *freedom*, and *experience*. In the periphery of the nuclear class “*personal care*”, there are 19 related terms. The following emerges as a relevant idea: tranquility and freedom in face-to-face didactic practice adapted to the use of technology.

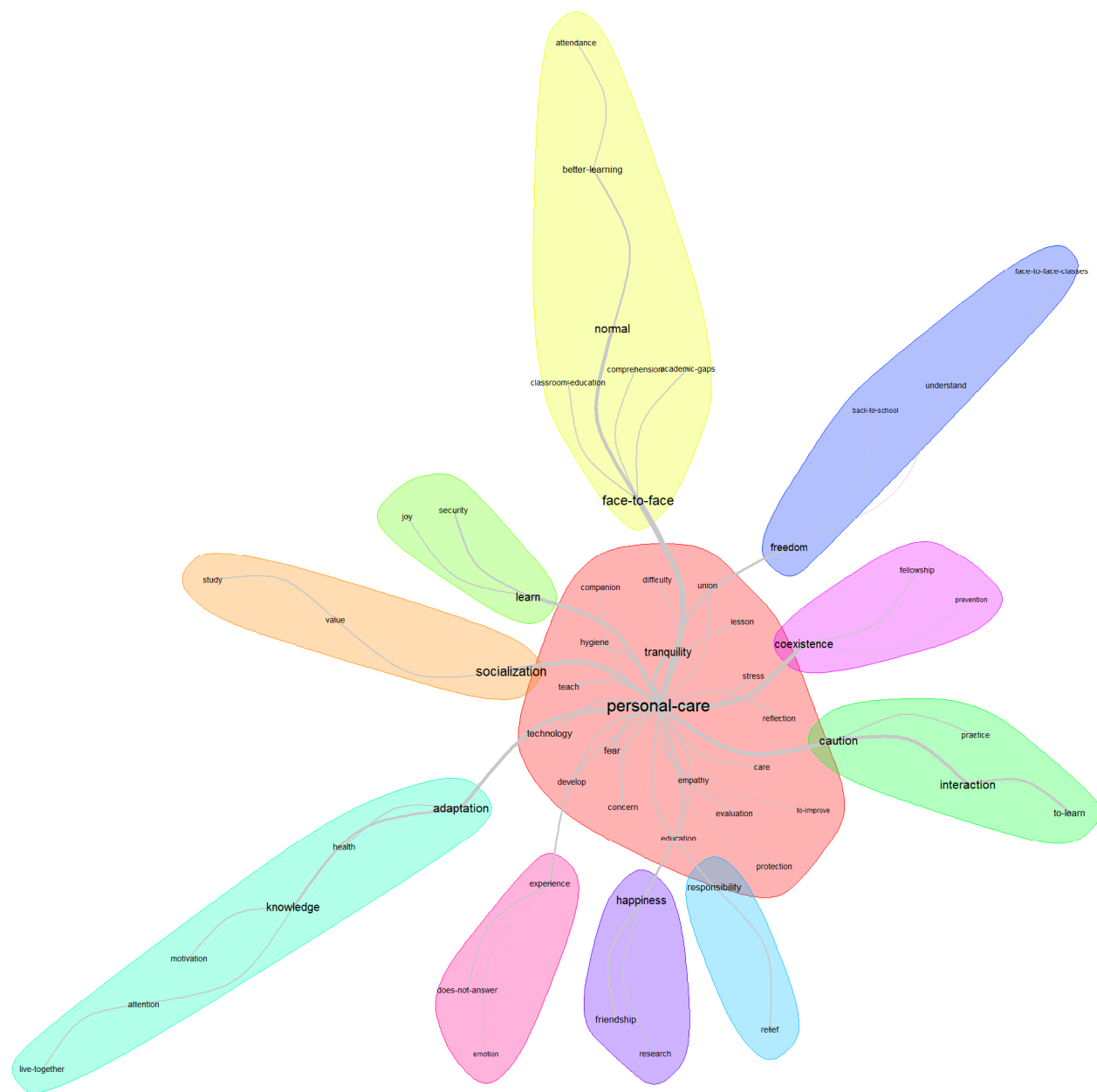


Figure 2. Similarity network: knowledge related to POS-COVID-19 and face-to-face didactic practice.

3.1.2. Didactic Skills and Practice in the Contexts of COVID-19 and POS-COVID-19

Figure 3 shows “*personal care*” as the core, directly linked to *virtuality* (which is associated with research for self-education and adapting to virtuality, protection protocols, and the new scenario for self-learning and self-studying). The figure outlines the following: study with the use of technology for personal care and coexistence in clean environments.

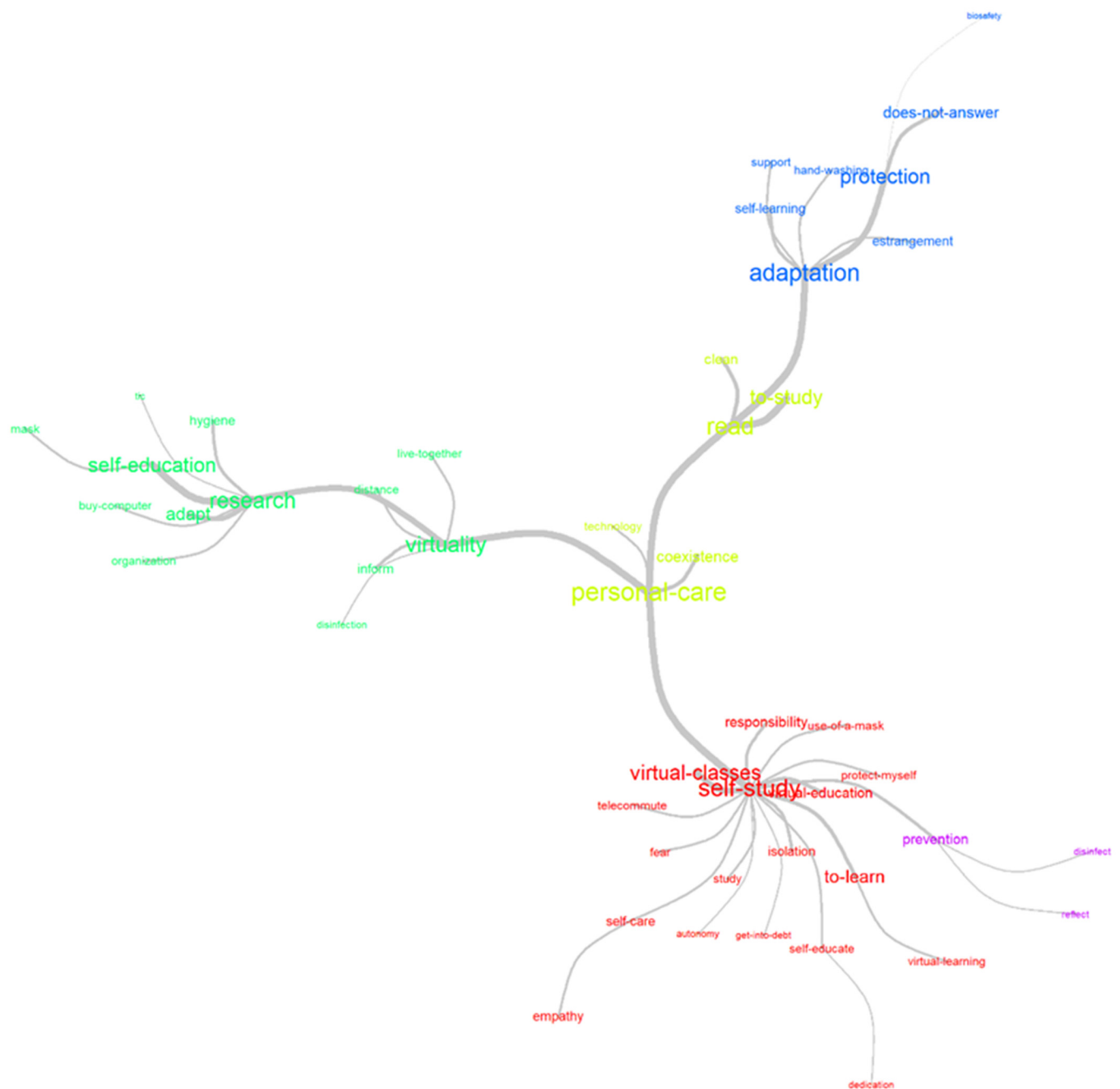


Figure 3. Similarity network: skills related to COVID-19 and virtual didactic practice.

On the contrary, Figure 4 shows a similarity network in which six lexical classes appear. “Research” arises as the core, merged with three lexical classes: one very close to it (*protection*) and two that are paired (*read–study* and *personal care–to study*). The class in the center binds 11 terms. In accordance with word frequency, rank, and co-occurrence, they emerge in the following order: *study*, *research*, *read*, *learn*, and *personal care*.

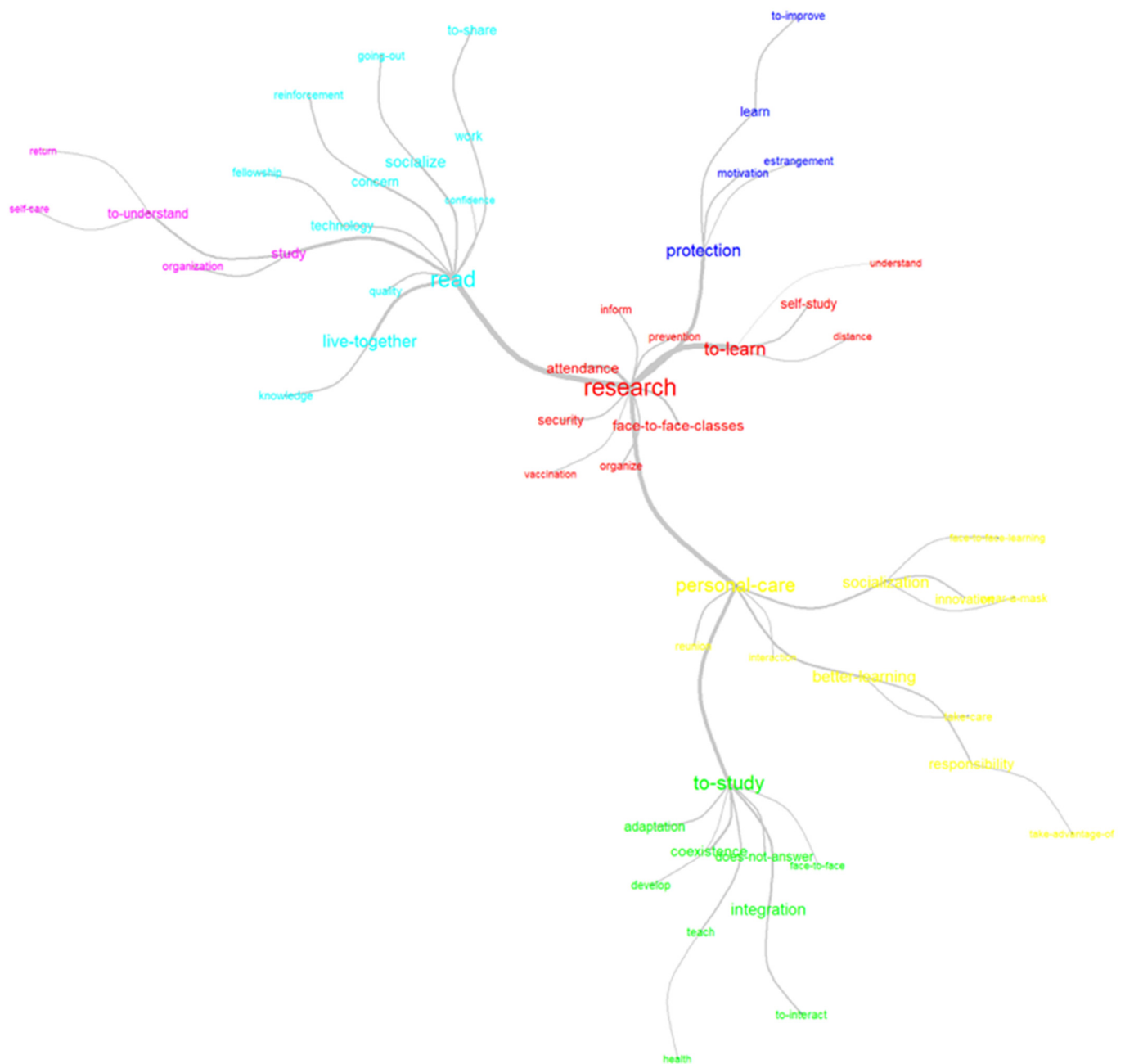


Figure 4. Similarity network: skills related to POS-COVID-19 and face-to-face didactic practice.

3.1.3. Attitudes and Didactic Practice in the Contexts of COVID-19 and POS-COVID-19

The graphic representation in Figure 5 is somewhat atypical. With greater representativeness, “despair” is directly linked to two lexical classes: *fear* and *anger*; the latter is verbally associated with *concern*. The representational class “despair” is coupled with 17 words. Of these, due to their semantic relevance, the following are linked: *anxiety* and *distress*. Due to their frequency, melancholic feelings prevail, such as: *sadness*, *fear*, *anger*, and *concern*.

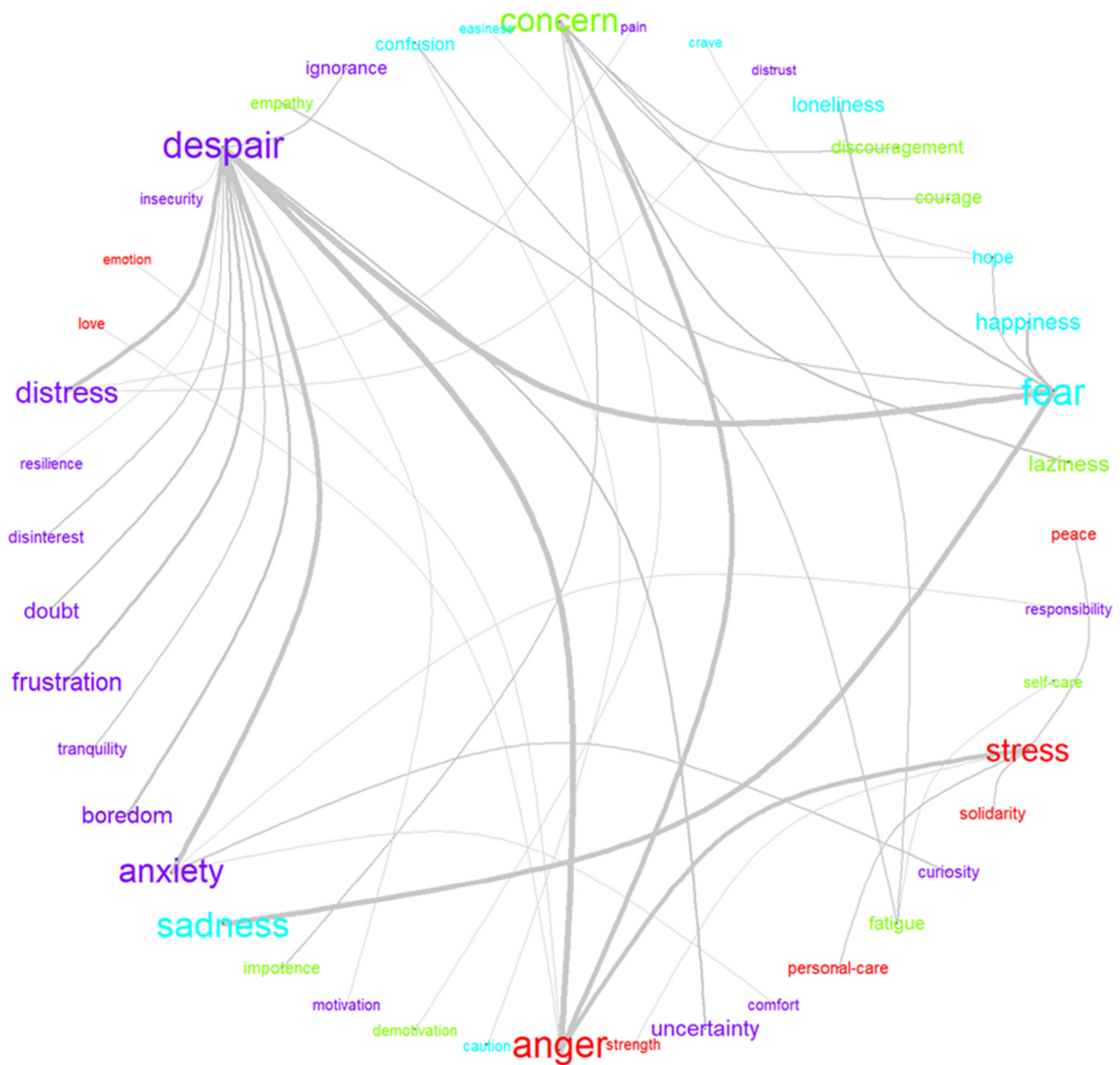


Figure 5. Similarity network: attitudes related to COVID-19 and virtual didactic practice.

Figure 6 shows a similarity network assigned to face-to-face didactic practice. As a basic representation, the lexical class “*happiness*” emerges, which could be labeled as an incomplete happiness, since it is closely connected with words that entail negative feelings such as *concern* and, more distant but with a similar hierarchy, *fear*. Peripherally, it is linked to 22 terms. This is reaffirmed when revising word frequency, given that terms such as: *tranquility*, *fear*, and *emotion* emerge as associated with *happiness*.

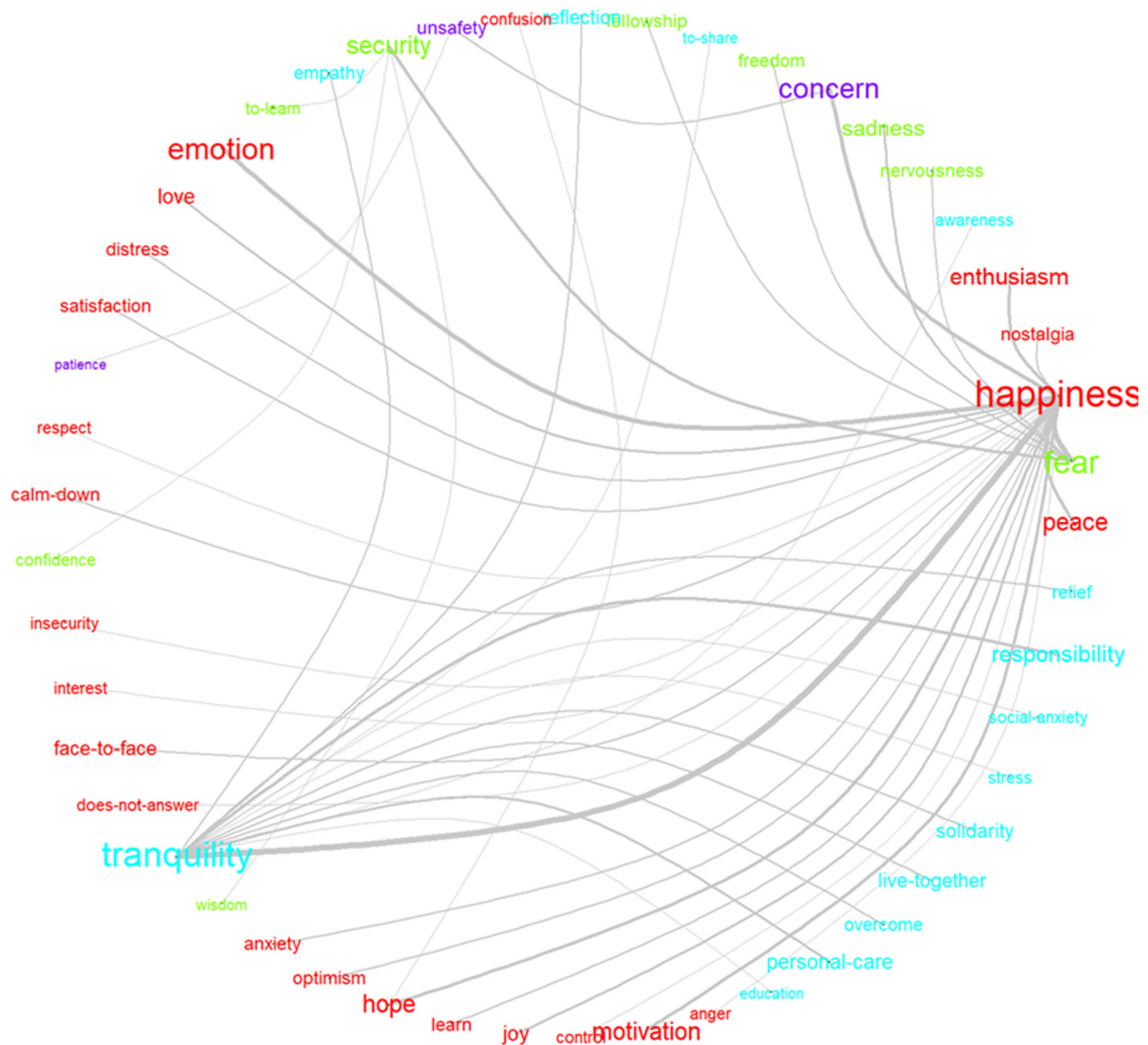


Figure 6. Similarity network: attitudes related to POS-COVID-19 and face-to-face didactic practice.

3.2. About Organization

When organization is mentioned, it refers to the internal structure (field of representation). This structure rests on an established hierarchy between multiple cognitive elements: the central core and the different peripheral (first and second) and contrasted relations. To determine the central cores, first, students were asked to generate three free expressions about the learning priorities they achieved from the didactic practices: virtual and face-to-face; then, they were asked to rank these expressions according to their order of importance; and finally, they were told to assign a connotative value to them.

The four-by-four matrix bellow is made up of two columns and two rows. In the upper part to the left, the core area is shown; the adjacent square, on the right, shows the elements of the first periphery. In the lower part, the square on the left contains the contrasting elements and, on the right, the elements of the second periphery, which constitute the limit or border of the representation.

3.2.1. Virtual Didactic Practices and Representations during COVID-19

Figure 7 presents a general analysis. It shows the representation of the virtual *teaching–study–learning* process. “Self-study” can be recognized as the central core of the representation, “technology management” as contrast, and, on the periphery, “boredom”.

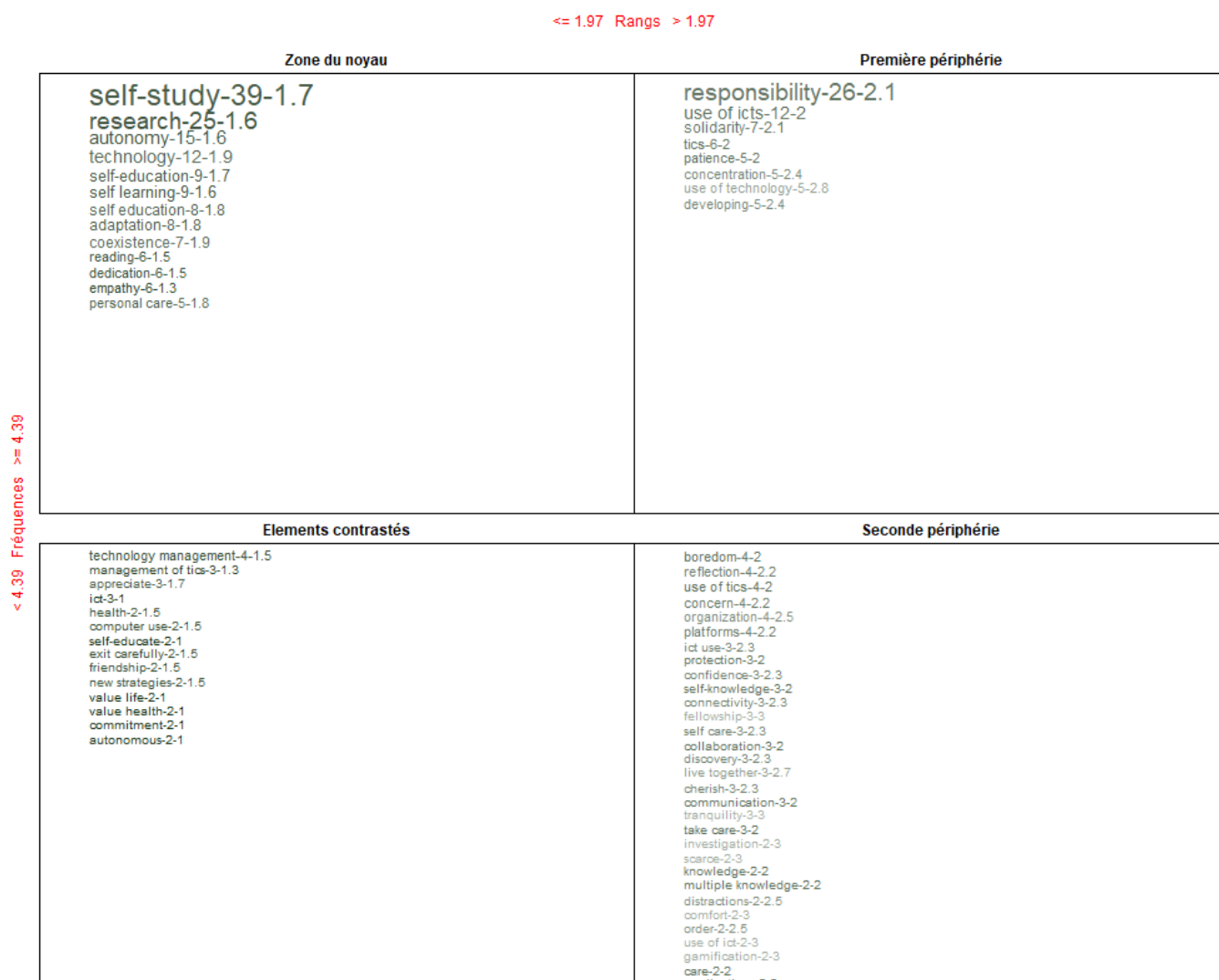


Figure 7. Prototypical analysis matrix: virtual didactic practices and representations.

3.2.2. Face-to-Face Didactic Practices and Representations during POS-COVID-19

Figure 8 shows the global representation of the *teaching–study–learning–face-to-face* process. “Responsibility” arises as the central core of the representation, “scaffolding” as contrast, and “problem-based learning (PBL)” on the periphery.

<= 1.98 Rangs > 1.98

<p>Zone du noyau</p> <p>responsibility-26-1.5 self-study-15-1.7 coexistence-13-1.9 personal care-7-1.9 patience-6-1.8 self learning-6-1.5 communication-6-1.5 to learn-5-1 adaptation-5-1.8 respect-5-1.8 reflection-5-1.4 solidarity-4-1.8 motivation-4-1.8 dedication-4-1.2 union-4-1.5 caution-4-1.2</p>	<p>Première périphérie</p> <p>research-14-2.2 fellowship-10-2.5 empathy-10-2.4 socialize-9-2.1 socialization-9-2.2 comprehension-8-2.2 to share-7-2 concentration-7-2.4 understanding-5-2.4 greater understanding-5-2.2 appreciate-5-2 honesty-5-2.2 attention-5-2.6 live together-5-2.2 autonomy-4-2 interaction-4-2 planning-4-2 knowledge-4-2 tics-4-2.5 collaborative work-4-2.8 friendship-4-2.8 collaboration-4-2.8</p>
<p>Elements contrastés</p> <p>scaffolding-3-1.3 to interact-3-1.7 significant learning-3-1.7 cooperation-3-1 didactic-3-1.7 improvement-3-1.7 take care-3-1.7 greater learning-2-1.5 skills-2-1.5 ict management-2-1.5 love-2-1.5 strategies-2-1.5 to thank-2-1 to plan-2-1.5 overcoming-2-1.5 discovery-2-1 learning-2-1.5 self-education-2-1.5 value life-2-1.5 constructivist-2-1.5 cherish-2-1.5 gamification tools-2-1.5 emotional-2-1.5</p>	<p>Seconde périphérie</p> <p>pbl-3-2.3 use of icts-3-2.3 learn more-3-2 better learning-3-2 easiness-3-2 significant-3-2.3 creativity-3-2 teamwork-3-2 understand-3-2 technology-3-2.3 team work-3-2 commitment-3-2.7 autonomous-3-2 cooperative-2-3 worth-2-2.5 internet-2-3 protection-2-2 support for-2-3 experiential-2-2.5 share-2-2.5 better understanding-2-2 health-2-2 look after-2-2.5 neglect-2-2.5 be responsible-2-2 to understand-2-2.5 coexistence with colleagues-2-2 virtual handling-2-2.5 individual-2-2 research improvement-2-2.5</p>

< 3.97 Fréquences >= 3.97

Figure 8. Prototypical analysis matrix: face-to-face didactic practices and representations.

4. Discussion

Firstly, the results related to contents and internal organization of the representations are considered for the discussion. Subsequently, the findings concerning the necessary didactic strategies are addressed.

4.1. About the Didactic Contents

Regarding content categories, the results from the three content dimensions are discussed: knowledge, skills, and attitudes, as well as their relationship with didactic practices before and after COVID-19.

The word “*virtuality*” emerges as a social representation related to “*knowledge*”. From the five elements associated with “*virtuality*”, four of them show an unfavorable connotation: *difficulty*, *failure*, *does-not-answer*, and *stress*:

- *Difficulty*, associated with *computers*, *hygiene*, and *empathy*. This perception is confirmed by expressions of dissatisfaction regarding their competence in the use of online tools, as well as their low level of technical access [8] and limited learning self-efficacy [21].
- *Failure*, linked to *autonomy* and *awareness*. It can be understood as a limitation in their independence to integrate themselves with knowledge and, therefore, as a dissatisfaction towards the quality of virtual learning interactions [12,20,21]
- *Does-not-answer*, linked to the feeling of a sedentary lifestyle that generated instability. One study [43] revealed that confinement and its consequent increase in sedentary

lifestyle could be related to increased psychological distress and stress, just as the following verbal association would confirm.

- *Stress*, associated primarily with *concern* and *fear*. This last association appears as a correlate of virtual interactions that, on multiple occasions, required meetings outside the regular schedule. For some authors, this situation could have increased psychological disorders in teachers and students [29–33].

In short, neither teachers nor students, and even society represented by multiple institutions, were prepared to face the challenge of educational continuity using technology. From their perspectives, they conceive personal, technological, social, and academic limitations when implementing professional training. In this scenario, it is evident that it is necessary to conduct studies that determine sociocultural, pedagogical, didactic, psychological, and curricular requirements that allow to generate relevant virtual didactic practices with educational quality and warmth.

If “*virtuality*” is disadvantageously associated with didactic practice; face-to-face education, with its core representation “*personal care*”, shows connections with more favorable elements that emerge after POS-COVID-19 personal experiences, such as *responsibility*, *coexistence*, *socialization*, *adaptation*, and *experience*, among others that have also been reported in other studies [3,12,44].

Although it is true that, after the pandemic, face-to-face teaching practices have been revalued, the multiple questions about the persistence of traditionalist interaction models should not be forgotten. It is stated that they only demanded memorization–repetition of encyclopedic contents, which is very easy to forget. This condition was presented due to its poor relationship with practical and experiential requirements, as well as its limited support for the development of higher mental processes in students. Here lies a line of research related to revalued representations. What will happen to face-to-face didactic practices? Will the systematic use of the same resources, methods, contents, forms of interaction, sequences, and evaluations be maintained?

On the other hand, as an alternative to conciliate and complement the two types of didactic practices, the hybrid educational option emerged as an integrative didactic model and to overcome the shortcomings found in virtuality and face-to-face education [45,46]. In this emerging educational context, what are the conditions and requirements to implement a hybrid educational modality in the different didactic scenarios?

Regarding skills, the social construct “*personal care*” was found to be repetitively associated. In this case, during virtuality, it is articulated with the “*research*” skill, which has also been reported as a central skill used in the context of COVID-19 [47–50]. However, in the context of UTN, when the term “*research*” is expressed, it would rather be referring to a process of information search using technology than to complex procedures of academic–scientific production. The ability “*read*” is identified, but it is seen just as a requirement to review various documents assigned by professors so that students memorize the content, as other researchers have suggested [3,12,41–44].

As a core skill in the context of face-to-face didactic practice, the following arises: “*research*”. It is directly linked to *to-learn*, *read*, and *to-study*, in addition to the solution of problems as a necessary and pertinent didactic model.

These findings, both in virtual and face-to-face education, confirm that a renewed didactic practice should have a greater impact on the development of thinking and action skills than the processes of transmission–reception of decontextualized contents. The didactic experience proves how difficult it is to advance in this way. Hence, it is necessary to carry out studies that contribute with solutions and strategies for awareness and teacher improvement.

When it is considered that attitudes connect people with a deep system of shared ideas that structure social experience [51], determining these attitudes is a priority to identify the representational web and cultural codes manifested by a social group.

In this case, the recognition of attitudes is more radical when they refer to the teaching–study–learning process during virtual education. This is evidenced by the central core of the

representation “*despair*”. The aforementioned representation was also reported by a study carried out with forestry students. Among other findings, women report experiencing fear, panic, concern, and despair [52].

In opposition to this, in a face-to-face modality, the representation “*happiness*” is found to be associated with more positive elements, although the feeling *fear* persists, linked to the security requirement.

As opposed but also complementary basic emotions, *despair* and *happiness* are represented in an apparently infinite temporal spiral. Through a progressive transition, they gestate, remain, and mutate; then, they come back in extended cycles. As attitudinal representations, they are situated contextually between the two types of didactic practices. Here lies a requirement for future research that could interpret the impact of the pandemic on the attitudes of contemporary humanity: What new attitudes did COVID-19 transfer to education for present and future generations?

4.2. About Organization

This section refers to the discussion related to the organization of didactic representation (central core and representational system) in the context of COVID-19.

The representation in virtual didactic practice has “*self-study*” as its central core, as a requirement for the development of digital skills. This result could not be restricted only to the study population in this research. Other researchers have reported the demands to integrate computer literacy for both teachers and students [27,28]. It is also necessary to consider “*boredom*” as an effect from importing didactic traditionalism into online teaching, despite the wide range of resources offered in the different virtual learning environments. On the other hand, it was also verified that this didactic situation was not only restricted to UTN’s context, as this has been reported in other scientific articles [12,20,21].

Apparently, the perception of low training quality of preservice teachers, in times of pandemic and its correlate (the virtual educational modality), became an identity trait in different parts of the planet. For this reason, student preparation in autonomous learning skills is imperative. With this, they could be more competent to work, by themselves, in the various classroom activities and multiple scenarios of didactic interaction.

The situation of *teaching–study–learning* in a face-to-face modality sets “*responsibility*” as a priority condition for the return to face-to-face learning. Accomplishing this would require the imbrication and support of scientific findings in the field of contemporary didactics that organize curricular integration processes and the implementation of a variety of didactic models [11–19].

In other words, as a didactic alternative, it is proposed to reconsider what it means to educate for understanding, sustainability, and socio-cultural commitment. On the other hand, it is of remarkable importance to reformulate educational foundations and practices for a POS-COVID-19 world.

4.3. Strategies That Could Potentially Support the Implementation of Comprehensive Didactic Practices for Primary Education Students

With respect to what has been discussed, there has also been reflections on the possibility of balancing strengths and weaknesses of virtual didactic practices with face-to-face didactic practice components in an effort to search for a hybrid educational interaction option [44–46]. Another proposal is the use of metacognitive strategies, reflective practice, participatory methods, and a more flexible pedagogy supported by research [47,48]. It is necessary to highlight computer literacy as a requirement, as well as the emphasis on the development of digital competence [53–56]. As stated, it would be necessary to integrate the joint participation of teachers, students, family, and society, which are all part of the university community, as well as regional governments and the private sector [1,18,44,57].

5. Conclusions

As contents of didactic practices and their representations, it was found that *difficult virtuality* requires *self-study* and the development of digital skills; the *careful* and *responsible* face-to-face modality promotes the use of collaborative strategies; *personal care* fosters research-based learning and problem solving; and gradual transformation and educational well-being are the result of living in safer and friendlier environments.

Regarding organization, hybrid education arose as a social representation due to the confluence of face-to-face and virtual didactic practices. On the one hand, the strengths of coexistence and affectivity are generated by face-to-face education, the administration of experimental practices, and support and relationship with colleagues and teachers, as well as the responsible participation of the various educational agents of society. On the other hand, computer literacy requires the development of digital skills and access to a megasource of information, tools, texts, and contacts, as well as multiple experiences that information and communication technologies make available.

6. Limitations and Future Lines of Research

The research focused on content and organization as basic components of the teaching–study–learning process, on which other didactic elements are focused and directed. However, studies related to representations about methods, resources, and evaluation could be developed. This would enable the implementation of a hybrid didactic practice that was established as an emerging representation, suggested by students and experts. In this way, it could be possible to contribute qualitatively to education quality improvement.

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