Digital Fluency and the Construction of Pedagogical Strategies for Distance Learning

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Abstract

The objective of the study is to identify Pedagogical Strategies (PS) that can contribute to the construction of Digital Fluency in the Distance Learning (DL) context. Technological changes in society include their own set of knowledge, skills, and attitudes called Digital Competences (DC). Specifically, in distance learning, digital fluency is considered paramount since it is related to the use of technologies where the subject feels digitally active, especially with regard to the production of content/materials for the virtual environment. This can be divided into five specific competences: Content Production, Data Protection, Networking, Virtual Resilience, and Teamwork. Thus, PS were created from the analysis of competences in order to assist the instructors to build them with their students in the DL environment. This study used a qualitative methodology based on an interpretative approach. The instrument used for data collection was an online questionnaire evaluating the Pedagogical Strategies for the Digital Fluency Competence. The target audience of the research was 90 specialists in the area of distance learning who responded and suggested changes to the PS. The results enabled the development of a framework with 46 Pedagogical Strategies divided into the 5 specific competences of Digital Fluency to aid teachers in meeting students' needs.

Keywords: Digital Competences; Digital Fluency; Pedagogical Strategies; Distance Education.

1. Introduction

Over the years the term competence has been modified with social transformations arising from new forms of communication, work, and relationships. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) was one of the first bodies to discuss and develop guiding documents on the certification and application of key competences in different sectors of education. The organization adopted the term "Knowledge Society" within its institutional policies in the late 1990s [1].

The definition of competence is a set of elements, specifically Knowledges, Skills and Attitudes, which help the subject to face certain problem situations. Competences are not taught, but conditions can be created to stimulate their development. In fact, students can be placed in complex situations that require the mobilization of their knowledge to understand, clarify, solve, develop, and make decisions when facing a problem. It should be noted that there is no single competence, in fact there are several depending on the particular situation [2].

Perrenoud [3] also analyzes the relationship of competences and the construction of knowledge, which he refers to as schemas. "Therefore, it is observed that developing, improving, building and evaluating competences requires a series of discussions and reflections, which lead to the customization of teaching and learning, according to the needs of the public involved" [4]. Thus, essential competences are linked to the use of digital technologies (DT) that allow the subject to accompany the technological and cultural evolution of society.

Hence, the definition of digital competence emerged to encompass the mobilizing elements of competence and the use of digital technologies as facilitators of the process, becoming a means for solving emerging situations [5]. According to Perrenoud and Thurler [6], this process is not simply about absorbing information, but also understanding, mobilizing, and using it in practical situations, influencing the application of competences for the construction of knowledge and individuals' integral development.

Digital competence is therefore fundamental for all subjects to participate actively, critically, and reflexively in society [7]. Yet, some digital competences are considered fundamental for current subjects, foremost being digital fluency (DF) because it encompasses not only the use of technologies, but also the possibility of authorship through the construction and sharing of digital materials [7; 8]. Thus, DF is necessary for an individual's professional and educational performance. It is also essential for distance learning (DL), because students must extrapolate their knowledge and use of DT. Moreover, they must know how to filter information, manage specific types of communication, and also develop digital materials to virtually interact and construct knowledge. However, this requires teachers to develop and apply pedagogical strategies that enable the process of building digital fluency with students.

The construction of competences must therefore be combined with the pedagogical strategies (PS) proposed by the teacher. According to Behar [9], PS combine several elements involved in the planning of a class, which are the key topics, didactic resources available, such as DT, and the needs of the students. Thus, it is important that PS promote dialogue and student participation, as well as contribute to the creation of interactive spaces to favor the construction of digital competences.

Thus, this article aims to identify PS that can contribute to the construction of the Digital Fluency Competence in the Distance Learning context. It is organized as follows: section two addresses digital fluency competences. Section three covers pedagogical strategies for building competences in DL and four describes the research methodology. The fifth presents the results and lastly the conclusions.

2. Competences: Focusing on Digital Fluency

Over the years education has been changing its teaching methodologies and looking for ways to meet the emerging needs of students due to social, cultural, and technological changes. Thus, competences have become an alternative to address not only the knowledges and content in a given class, but also the skills and attitudes that are essential for the integral development of the subject [8]. According to Behar [10], a competence is a set of Knowledges (knowing), Skills (knowing how), and Attitudes (knowing how to be), synthesized in the acronym KSA, when mobilized can help in facing problem-situations and dealing with the new, enhancing changes in the teaching and learning process in everyday life. This author argues that knowledge is acquired, that is, it is the understanding of concepts and techniques necessary to achieve

objectives and is obtained using different resources, from simple observation, readings, previous training, and academic training itself. Skill on the other hand, are knowing how to do or being able to do. For the individual they represent their aptitude in practical activities to achieve their goal and are associated with the ability to produce based on acquired knowledge, experience, and progressive improvement of skill developed with time and experience. Finally, attitude is to be or want to do. For the individual this entails the conscious and emotional decision of how to act and react on a daily basis based on facts and other people in the environment. Figure 1 illustrates the elements of Knowledges (knowing), Skills (knowing how), and Attitudes (knowing how to be).
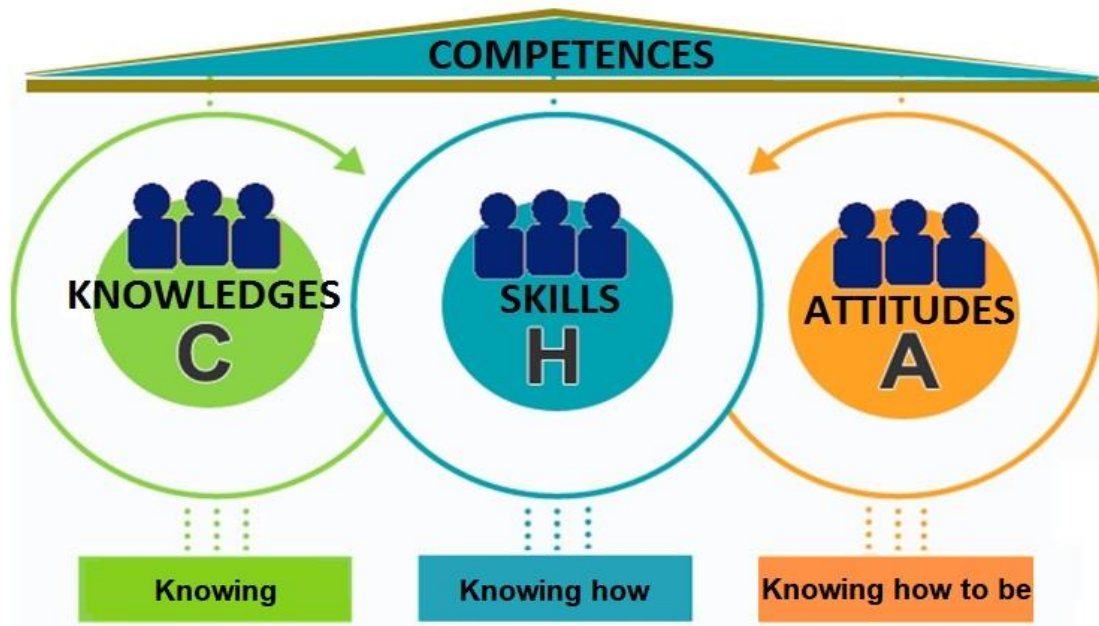

Figure 1. Elements that compose a competence. Source: Created by the authors (2020) based on Behar [10].

The mobilization of the constituent elements of a competence is part of the teaching and learning process [7; 10]. However, with the increased use of digital technologies (smartphones, notebooks, computers, among others) there is also a need to include these resources in the classroom. It is therefore pertinent to rethink competences to include the specificities of DT.

DC are fundamental in the knowledge society, since they enable the subject to use technological resources responsibly to solve real problems. Hence, DC must also be considered in DL, because the use of digital technologies are integrated and serve as the basis for interaction between students and teachers as well as among students themselves when doing activities and accessing the virtual learning environment (VLE). According to Behar [10], many DC must be addressed in distance learning, such as organization, communication, and cooperation. However, digital fluency (DF) is considered to be particularly important for this modality, due to its link to resource use as well as the challenge of planning, developing, and sharing copyrighted materials in these environments. This competence focuses on subjects' use of technology to enable them to feel digitally active or like a participant in technological advances. Fluency therefore encompasses not only use, but also the creation and production of content and materials [2].

Martins and Giraffa [11] emphasize the importance of forms of communication for this competence. They state, "digital fluency refers to the naturalness in articulating and adapting to digital language (digital forms of communication)" [11]. Hence it can be considered the most complete digital competence, because it is composed of both functional digital literacy and critical digital literacy. The subjects are not simply spectators, but can instead create, transform, and generate information on the Internet, becoming critical and reflective producers of digital content [7].

According to Machado et al. [12], "subjects will be digitally fluent only if they can go beyond knowing how to search for a text, read, write, save, and send a document through digital technologies. In other words, to be critical of how to combine the use of different digital tools". Tarouco [13] argues that DF is a personal ability, in which individuals evaluate, select, learn, and use the appropriate technologies for their personal and professional activities. According to Silva and Behar [2], it is a competence for appropriate, creative, autonomous, and authorial use of technology. The fluent subject must be critical of the information and content shared on the Internet, selecting reliable and safe sources, being proactive, curious, and flexible regarding new ideas.

Digital fluency is therefore paramount in distance learning because it includes the use of communication and learner's ability to safely search for information on the computer network, aiming to improve each subject's learning process [7]. In fact, Silva [7] highlights five specific digital competences included in digital fluency for the profile of DL students, namely: content production, data protection, networking, virtual resilience, and teamwork, as can be seen in Figure 2.
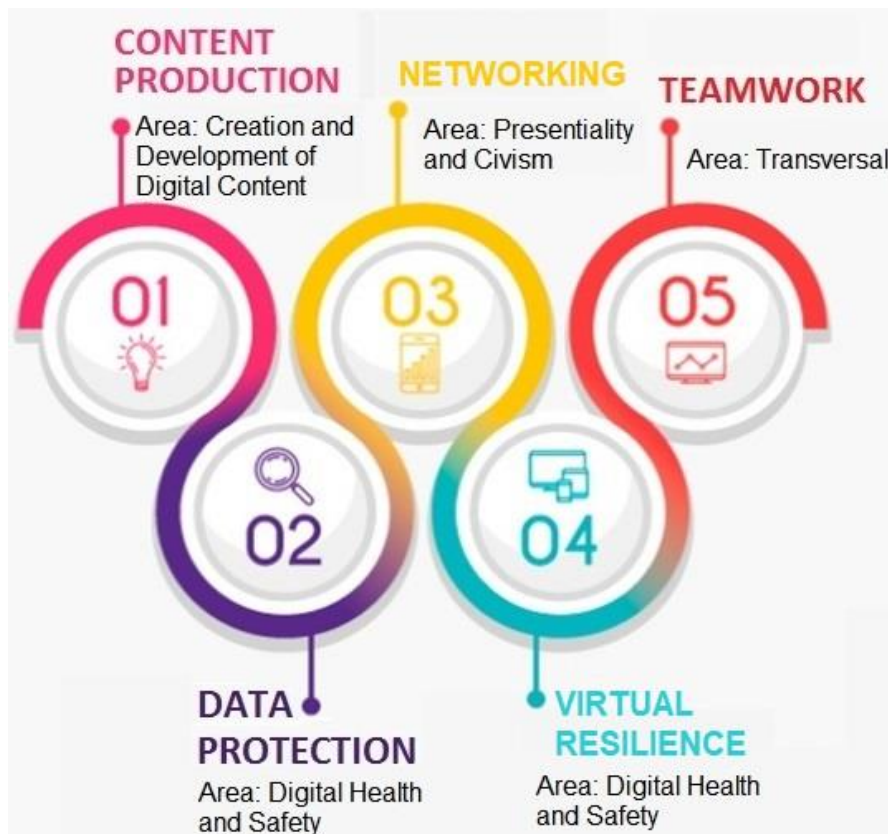

Figure 2. Specific digital competences of digital fluency. Source: The authors (2020) based on Silva [7].

These five specific digital competences of digital fluency based on Silva [7] are explained in detail below:

1. *Content Production*: The creation and development of digital content necessary for learning in different formats. It involves the (re)elaboration or integration of content modifying, refining, and combining resources for using and creating materials in the network. The goal is to express oneself creatively through digital media for learning purposes.

2. *Data Protection*: Understanding of risks, threats, and implementing security. The objective is the protection of personal data, enabling students to protect themselves from threats, cyberbullying, and fraud.

3. *Networking*: Focused on the safe and responsible use of the network for student learning, based on values such as honesty, ethics, and respect. The goal is to choose appropriate content to digitally socialize and network.

4. *Virtual Resilience*: The way students deal with changes and adapt to different obstacles and difficulties. The goal is the process of facing adversity and raising awareness.

5. *Teamwork*: Covers the intra and interpersonal relationships that allow students to express and communicate their desires, emotions, opinions, and expectations. These elements can also be addressed from an affective perspective. The objective is linked to the competences of cooperation and resilience.

Hence, according to Almeida et al. [14], distance learning is based on the use of digital technologies requiring users to have knowledge regarding resources, favoring virtual teaching and learning. It is therefore necessary to know how to develop pedagogical strategies that encourage learners to solve problems, make decisions, analyze data, discuss and apply ideas, as discussed below.

3. Pedagogical Strategies for Competence Construction in DL

Pedagogical strategies (PS) are not clearly defined in the literature. In fact, there are several quite broad explanations or related to some quite specific teaching paradigms. Strategies can refer to methods, techniques, and practices that act as resources for achieving pedagogical objectives.

Arceo et al. [15] argue that strategies are focused on the teacher's actions, the procedures or resources used by the teacher to promote meaningful learning. López and Remesal [16] and Perraudeau [17] on the other hand, understand PS as the coordinated involvement of procedures, chosen from a set of possibilities. Therefore, they are also characterized by their flexibility to meet and adapt to students' needs.

Thus, PS can be thought of as a set of educational actions that provide teachers with resources to apply to their classroom planning. They include tips and suggestions for the use of technological resources [9; 18].

Amaral [18] argues that teachers must keep in mind that each student appropriates the content at a different pace when putting PS into practice, making it necessary to consider the student's previous development and context. The author also mentions that teachers can only act in a personalized way and create PS capable of contemplating subjects' needs by observing these distinct characteristics.

Masetto [19] highlights the need for educators to come up with strategies that facilitate the process of teaching and learning in the classroom, using diverse materials, such as digital resources, teaching techniques, educational actions, etc. This author also stresses that it is necessary to: a) use the most

appropriate strategies for the intended purpose in pedagogical practice; b) have appropriate strategies for each subject or group of students; c) employ a variety of flexible PS throughout the process. Hence, it is crucial to consider the clarity of the objectives, both for the teacher and student, as well as the resources and/or techniques that are used in order to guide the actions applied to the construction of DC. The use of PS for DC is required in distance learning, because it is possible to mediate and create forms for students to build their competences through actions.

The use of Pedagogical Strategies for the construction of digital fluency requires the teacher to propose activities that instigate not only interaction and communication in the VLE, but also understanding how to plan and share the materials in order to collaborate with colleagues. Therefore, strategies must always be related to challenging situations that bring and/or raise problems that need to be solved or spur creation [8]. Thus, it is pertinent to investigate PS that can be developed for constructing digital fluency in distance learning, which is the focus of this study.

The methodology adopted for designing and evaluating the PS to construct the digital fluency competence is presented below.

4. Methodology

This is qualitative work using an interpretative approach. The target audience was 90 DL teachers who have experience using digital technologies. The study was carried out in three phases. In the first, 28 pedagogical strategies were developed to construct DC based on experience and literature [7; 20] in adult education and distance learning. The PS were created for each of the 5 specific digital fluency competences, which are: Content Production, Data Protection, Networking, Virtual Resilience, and Teamwork. Chart 1 presents the specific competences and the respective pedagogical strategies that were developed.

Chart 1 - Specific competences and their respective pedagogical strategies.

SPECIFIC DIGITAL FLUENCY COMPETENCE	PEDAGOGICAL STRATEGY
1 - Production of digital content.	- Present methodologies to produce digital materials. - Present the importance of copyrights in digital production. - Request the production of a storyboard for digital materials. - Use digital authoring tools to produce materials and share them with colleagues and teachers in distance education. - Use tools that enable the production of digital materials in the VLE. - Share original materials produced with colleagues and teachers in the VLE. - Use evaluation and self-assessment questionnaires regarding the original productions. - Produce audiovisual content for web communication.

2 - Data protection	- Present possibilities for protecting data in social networks and, specifically in the VLE. - Present and discuss good virtual etiquette (netiquette) in the VLE. - Develop an e-book to share the best practices for data protection and managing information securely. - Create self-assessment questionnaires on the practices adopted to protect individual data in the network.
3 - Networking	- Promote debate on the impact of Information and Communication Technologies on education. - Present and discuss good virtual etiquette (netiquette) in the VLE. - Promote activities that enable the sharing of materials. - Develop group activities to enable collective networking. - Include discussion forums on transversal themes regarding the topics covered.
4 - Virtual Resilience	- Develop virtual resilience using a collaborative writing tool. - Request materials to be shared in the VLE. - Present problem situations so that students can collectively discuss and solve current problems. - Include forums for discussing transversal themes on the topics covered.
5 - Teamwork	- Develop activities for the "Digital Hackathon", the programming championship. - Perform gamification activities. - Present and discuss good virtual etiquette (netiquette) in the VLE. - Promote activities that enable the sharing of materials. - Develop group activities to promote collective networking. - Request sharing of materials in the VLE. - Present case studies that enable students to reflect on the importance of conflict management in group work.

Source: The authors (2020) based on Silva [7] and Coll et al. [20].

In Phase 2 the PS was assessed by DL teachers. An online questionnaire was created based on Chart 1, consisting of seven essay questions and thirteen multiple-choice questions for teachers working on the topic. The questionnaire was disseminated through institutional groups, the social network Facebook, Whatsapp, and e-mail contacts were also used. The objective was to evaluate the PS developed for the digital fluency competences. The respondents had to accept the terms of agreement in order to access the form. It was divided into three parts: participant profile with 3 questions, assessing digital fluency competences with 6 questions, and their respective pedagogical strategies with 10 questions. In all, 90 DL specialists responded and suggested changes for the PS.

In phase 3, the information collected from the questionnaires was qualitatively analyzed, based on an interpretive approach, applying the steps outlined by Bardin [21]. According to the author, there are three phases for the organization of an analysis, which are: (1) pre-analysis, (2) exploration of the material and, (3) treatment of the results. In the initial phase, (1) the material is organized, documents are chosen, hypotheses are formulated, and indicators are developed to guide the final interpretation. The following rules must be followed: (a) exhaustiveness, examine every subject without omitting any part; (b) representativeness, concerned with samples that translate the universe; (c) homogeneity, collecting data using the same techniques and similar individuals; (d) pertinence, adapt the documents to the research objectives and; (e) exclusivity, classifying an element in only one category. In the material exploration phase (2) the data is coded; a process that transforms and aggregates in registration units (words, themes, or other units), with subsequent categorization. In the last phase (3) the treatment of the results comprises coding and inference. The researcher needs to return to the theoretical framework and ground the analysis to justify the interpretation.

The following section presents the results of the research.

5. Results

This article identifies pedagogical strategies that can contribute to the construction of the digital fluency competence in the DL context. The suggestions and observations made by the 90 participants when answering the questionnaire were examined, making it possible to reflect on and implement the changes that were suggested in the PS. The responses were therefore categorized into: a) Participant profile; b) Evaluation of digital fluency competence and; c) Evaluation of PS for the digital fluency competence.

5.1 Participant Profile

The 3 questions asked to create the participant profile were: gender (multiple choice), age (fill-in-the-blank), and academic background (fill-in-the-blank). The majority of the subjects (n = 63) were female. Their ages varied between 24 and 74 years of age. The most common ages were 39, 41, and 50, with 6 participants each, as can be seen in Figure 3.
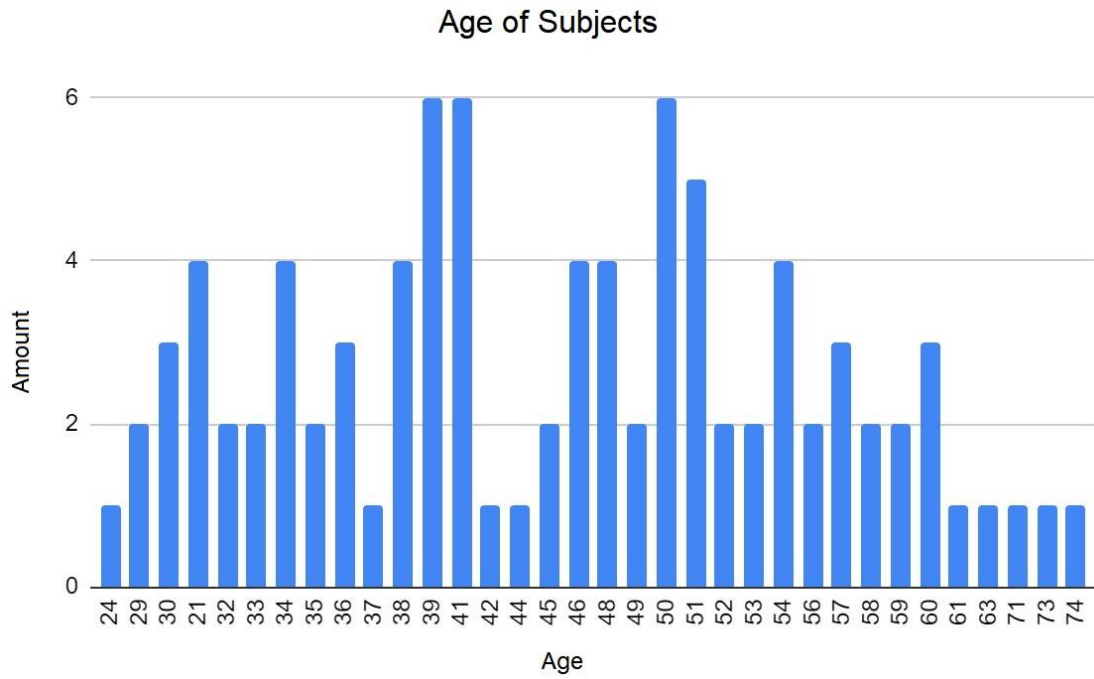
Age of Subjects

Figure 3. Participants' age. Source: The authors (2020).

Lastly was the level of academic study. The majority had their undergraduate degree (n=35), followed by those with Ph.D. and Master's degrees (n=27) and specialists (n=22), as illustrated in Figure 4.
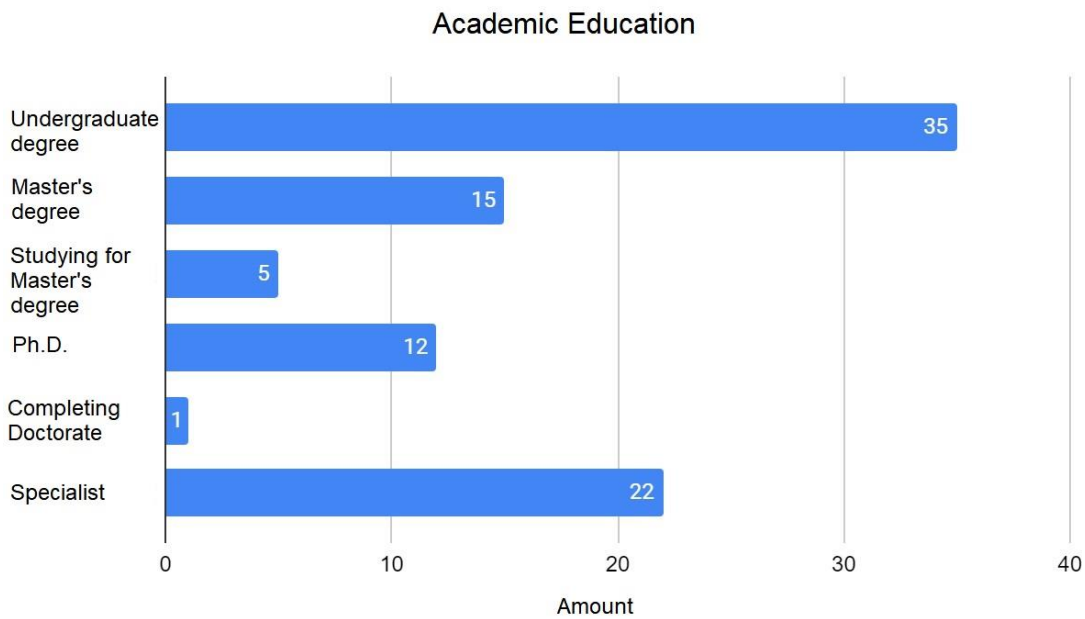
Academic Education

Figure 4. Academic Education. Source: The authors (2020).

The responses point to a more mature profile, the majority with graduate studies (n = 49) and primarily female (n = 63). Therefore, this public has a considerable theoretical foundation and also predominantly high teaching experience.

5.2 Evaluation of the Digital Fluency Competences

The second part of the questionnaire was related to the assessment of digital fluency competences. Respondents were asked to assign a number based on the 5 - point Likert scale, with the following values: "1 - not important", "2 - not very important", "3 - moderately important", "4 - important" and "5 - very important" for each of the 5 specific competences.

The 6 questions were: 1) In your opinion, what is the importance of the digital fluency competence and pedagogical strategies for distance learning?; 2) In your opinion, what is the importance of the specific competence of content production for distance learning?; 3) In your opinion, what is the importance of the specific competence of data protection for distance learning?; 4) In your opinion, what is the importance of the specific competence of networking for distance learning?; 5) In your opinion, what is the importance of the specific competence of virtual resilience for distance learning?; and 6) In your opinion, what is the importance of the specific competence of teamwork for distance learning?

When responding to the first question, the majority of participants (84.4%) considered the digital fluency competence and pedagogical strategies to be "very important", while 13.3% rated them as "important" and only 2.2% as "moderately important", as seen in Figure 5.
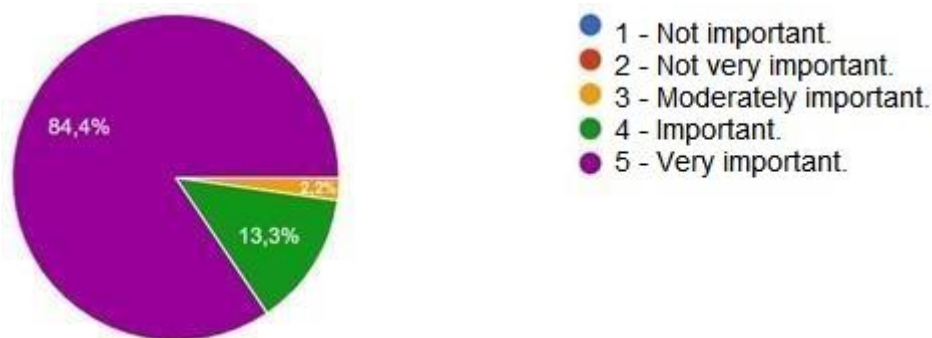

Figure 5. Importance of the digital fluency competence and pedagogical strategies. Source: The authors (2020).

Question 2 rated the importance of the specific competence of content production in distance learning. It was rated "very important" by 74.4% of people, "important" by 22.2%, "moderately important" by 2.2% and "not important" by 1.1%. In other words, only one subject considered this competence unimportant, as shown in Figure 6.
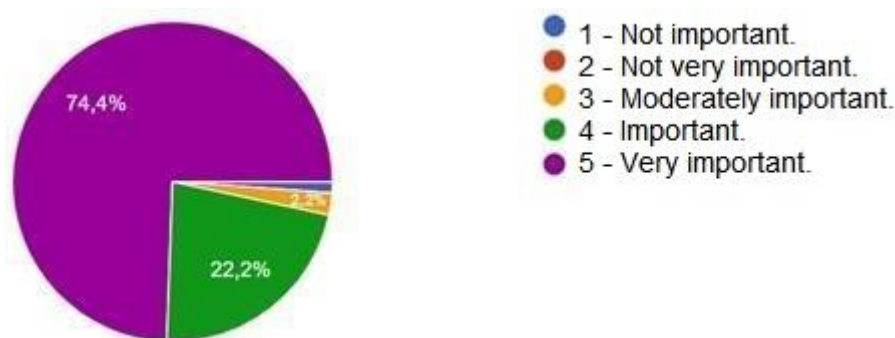

Figure 6. Importance of content production. Source: The authors (2020).

Most respondents (77.8%) rated the data protection competence "very important", whereas 12.2% responded "important", 7.8% "moderately important," and 2.2% "not important", as shown in Figure 7.
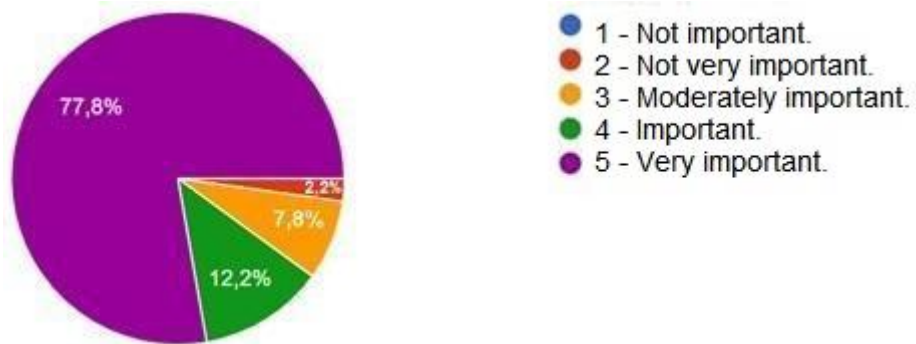

Figure 7. Importance of data protection. Source: The authors (2020).

Moreover, 67.8% of the participants rated networking as "very important", 17.8% as "important", 13.3% "moderately important," and 1.1% "not very important", as shown in Figure 8.
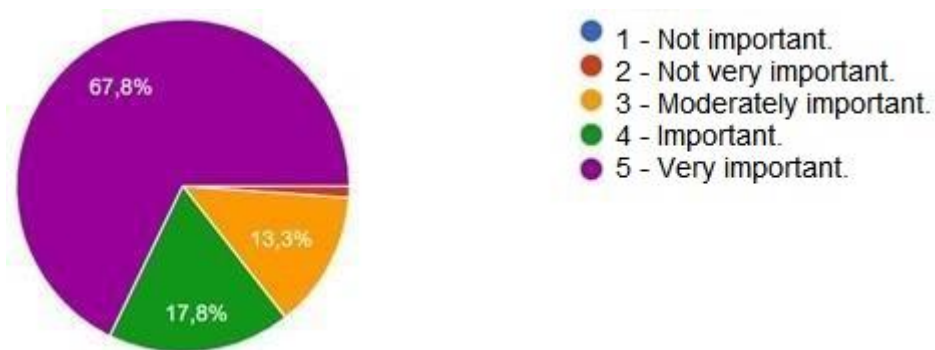

Figure 8. Importance of networking. Source: The authors (2020).

In terms of virtual resilience, 66.7% of people considered it "very important", 22.2% "important", 10% "moderately important," and 1.1% "not very important", illustrated in Figure 9.
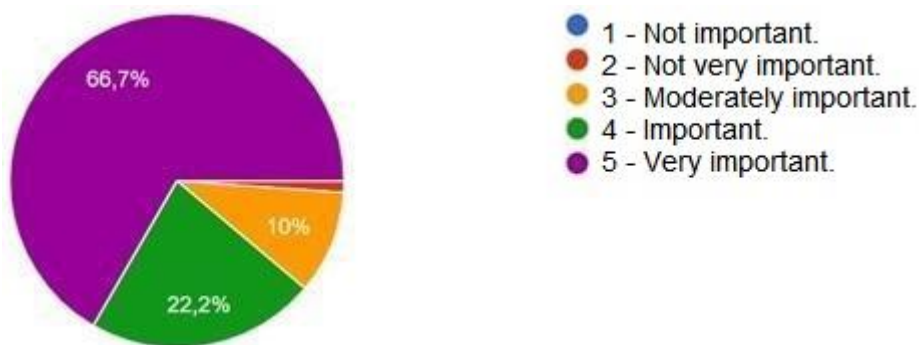

Figure 9. Importance of Virtual Resilience. Source: The authors (2020).

The last question in the second part of the questionnaire was about teamwork and 77.8% of the subjects

rated it as "very important." In addition, 15.6% rated it as "important", 4.4% "moderately important", 1.1% "not very important," and 1.1% "not important", as shown in Figure 10.
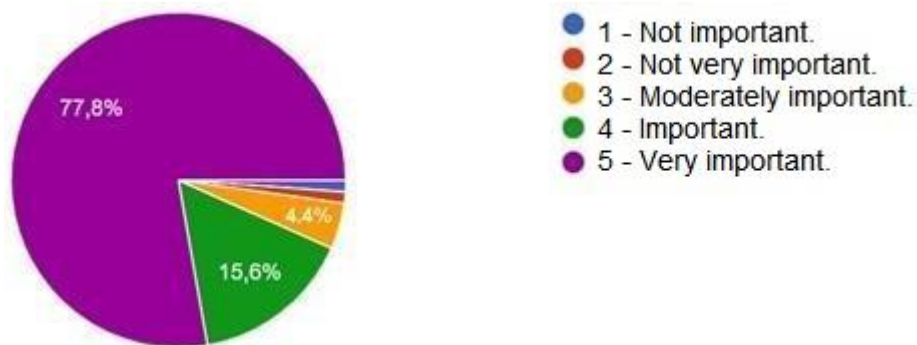

Figure 10. Importance of teamwork. Source: The authors (2020).

Therefore, the conclusion is that the 5 digital fluency competences were considered "very important" in all cases, with the lowest percentage obtained being 66.7% in virtual resilience, which is still a high value because it refers to the opinion of 60 participants. The results show that all the analyzed DC are relevant in the distance learning context, making it necessary to develop and apply PS that allow them to be constructed in the virtual environment, which will be discussed below.

5.3 Evaluation of the Pedagogical Strategies for the Digital Fluency Competences
The third and last part of the questionnaire evaluated and the adequacy of the pedagogical strategies created for each of the 5 digital fluency competences. It was composed of 10 questions, in which half were based on the Likert scale, using the same criteria as the evaluation of the DC to verify the importance of PS. The other half consisted of essay questions to give participants space to make suggestions for the strategies for each competence.

The pedagogical strategies created for content production were rated as "very important" by 76.7%, whereas 16.7% considered them "important", 4.4% "moderately important", and 2.2% "not very important". Participants' suggestions for this competence are presented in Chart 2.

Chart 2 - Participants' suggestions for the PS and content production.

"*Exclude the production of storyboard*" (P6).
"*Add ways to disseminate the production of digital content*" (P9).
"*Add online debates with different people*" (P11).
"*Remove the production of storyboard*" (P12).
"*Include remote experiences*" (P21).
"*Adopt the principles of open education in the production of content. More open Creative Commons licenses*" (P33).
"*Insert self-assessment*" (P38).
"*Remove the request to produce a storyboard*" (P39).

"Add gamification in Google form" (P43).

"Add user experience (UX) stage" (P46).

"Delete storyboard request" (P59).

"Eliminate the storyboard" (P70).

"Remove: Request to produce a storyboard for digital materials" (P73).

"Use diagnostic assessment questionnaires with the participants in the VLE about what they hope to learn and what they already know" (P76).

"Remove storyboard production" (P77).

"*I would add a podcast*" (P84).

"*Include hypertexts*" (P87).

Source: The authors (2020).

It is important to note that P6, P12, P39, P59, P70, P73, and P77 all suggested removing the storyboard from the PS. P9, on the other hand, suggested adding ways to disseminate content production. Other suggestions for additions included, P11 online debates, P21 remote experiences, P33 principles of open education in content production, P38 self-assessment, P43 gamification, P46 user experience, and P76 would perform diagnostic assessments. Finally, P84 suggested adding a podcast and P87 hypertexts. Based on the suggestion of seven participants, the storyboard was removed from content production to suit the evaluators' scores and five PS were added to the final table, as suggested by the participants.

The PS for data protection were also analyzed, in which 76.7% of the respondents considered them "very important", 14.4% "important", 7.8% "moderately important," and 1.1% "not very important". Chart 3 presents their suggestions.

Chart 3 - Participants' suggestions for the data protection PS.

"*Add how to make smart decisions about managing sensitive data" (P2).*

"Assessing fake news" (P3).

"Identity verification" (P11).

"More about protective laws" (P21).

"Learn the legislation on the topic" (P27).

"Remove ethics and netiquette" (P33).

"Address the types of licenses that exist" (P40).

"Emphasize the importance of respect in the virtual environment, not sharing links, spam, things that are out of context and that can harm others" (P41).

"Add a case related to the General Data Protection Law (LGPD)" (P46).

"The publication and punishment for those who plagiarize" (P60).

"I think that the issue of sites that are fake and have false links can be included" (P67).

"Remove presenting and discussing netiquette in the VLE" (P68).

"If it is not foreseen, it would be interesting to raise awareness of the identification of false content" (P69).

"Exclude netiquette" (P85).

Source: The authors (2020).

As Chart 3 reveals, P3, P41, P67, and P69 considered it important to make students aware of false content. P21, P27, P40, P46, and P60, on the other hand, emphasized the importance of including more information about data legislation. In fact, P46 called for "Adding a process related to the General Data Protection Law (LGPD)". P33, P68, and P85 all suggest removing the PS on the presentation and discussion of netiquette in the VLE. Also, P2 suggested adding how to make intelligent decisions about managing sensitive data and P11 would verify identity. Thus, there were various aspects to improve the PS that were suggested. Based on these, the PS linked to the netiquette was removed, as suggested by three participants, and four new strategies were also added.

Networking was evaluated as "very important" by 65.6% of the participants, "important" by 21.1%, and "moderately important" by 13.3%. Chart 4 presents the suggestions for the strategies created for this competence.

Chart 4 - Participants' suggestions for the networking PS.

"I would add coexistence and learning in virtual environments" (P2).

"I would remove group activities" (P6).

"I would create more direct communication between the students and teacher so that learning actually takes place" (P8).

"Include traceability" (P11).

"Create a Whatsapp group and meeting rooms, so that the participants can get to know each other better" (P23).

"Hold some real time meetings" (P27).

"I would add the construction of socioemotional skills for coexistence" (P35).

"Insert debate about the impact of technology" (P38).

"I would add a space for group work" (P46).

"Also address digital technologies; encourage exchange and coexistence through digital social networks" (P56).

"Encourage interaction with games in the classes" (P62).

"Address the rules of good coexistence, rights, and duties" (P66).

"Use collaborative tools in the process" (P67).

"Promote activities that enable sharing materials" (P68).

"Use video conferencing for better interaction" (P71).

"Share materials that help colleagues to understand the topic" (P76).

"Remove Netiquette" (P84).

"Create a collaborative Padlet" (P85).

Source: The authors (2020).

There were many suggestions for the networking PS. For example, P2 would add coexistence and learning in virtual environments, P11 would include traceability, P35 would add construction of socioemotional skills, P66 would address rules of good coexistence, and P84 would remove the netiquette. Both P68 and P76 argue that activities should be added that make it possible to share materials. On the other hand, P38

and P56 would address the use of technologies. The recommendation of using collaborative tools in the process was made by P62, P67, and P85. Yet, P6 would remove group activities, in contrast to P8, P23, P27, P46, and P71 who would add a more direct communication between the students as a strategy to bring them closer, as P23 suggested using complementary features such as "Whatsapp and classrooms meetings". Perhaps the ample amount of divergent suggestions made by the participants could justify the low value of 65.6% who considered the strategies "very important". Hence, five PS were added and the one referring to the netiquette was removed, making there a total of nine final pedagogical strategies.

Virtual resilience PS was considered "very important" by 71.1% of the participants, "important" for 18.9%, "moderately important" for 7.8%, and "not very important" for 2.2%. The suggestions for this competence are presented below.

Chart 5 - Participants' suggestions for the PS for virtual resilience.

"Work more on culture and virtual conduct" (P11).
"Add content to help students with this aspect" (P23).
"Provide students with knowledge about self-regulation and time management" (P33).
"Insert collaborative writing tools" (P38).
"Make more space for exchanges" (P46).
"Insert more debates" (P49).
"Include the exploration of interactive tools and construction of narratives" (P68).
"Encourage contact with colleagues and the DL team" (P71).
"Share strategies for better use of technological tools in the virtual environment" (P76).
"Encourage active listening" (P85).

Source: The authors (2020).

There were not many suggestions regarding virtual resilience. P11 would include working more on culture and virtual conduct, P23 would add content to help students, P33 would provide more information about self-regulation and time management, P46 would create more space for exchanges, P49 would create more debates, and P85 would encourage active listening. Moreover, P38, P68, P71, and P76 would encourage the use of technological tools for interaction and contact with colleagues. Due to the positive overall evaluation and few suggestions, the PS created can be considered pertinent. Therefore, three were added to the final table, making a total of seven strategies.

The last digital fluency competence was teamwork. It was rated "very important" by 78.8% of the participants, "important" by 20%, and "moderately important" by 1.1%. Chart 6 shows the suggestions made for the PS.

Chart 6 - Participants' suggestions for the teamwork PS.

"Add pedagogical interactions based on the collaborative teaching perspective" (P2).
"Include a group study to get to know the participants in the teamwork proposed" (P20).
"Intensify the gamification tools" (P21).
"Develop problem situations that enable interaction when searching for solutions" (P32).
"Include collaborative digital tools for teamwork" (P34).

> *"Do activities and dynamics that emphasize the importance of collaboration" (P56).*
> *"Encourage collective authorship linked to the specific competence of teamwork" (P64).*
> *"Use meeting platforms" (P83).*
> *"Develop collective construction of materials that involve all students" (P85).*

Source: The authors (2020).

Additions were suggested by various participants. In fact, P2 would add pedagogical interactions from the collaborative teaching perspective, P20 a group study, P21 would apply gamification, P32 would develop problem situations that would enable interaction, P34 would use digital tools, P56 would carry out activities and dynamics that emphasized the importance of collaboration, P64 would indicate collective authorship, P83 would employ the use of meeting platforms, and P85 would elaborate the collective construction of materials. Thus, four PS were added and none were removed, making a total of eleven strategies.

Hence, based on the participants' responses, the PS were modified as shown in Chart 7.

Chart 7 – Pedagogical Strategies for Digital Fluency Competences.

COMPETENCE/ DATA	PEDAGOGICAL STRATEGIES
Digital content production DC	• Present content production methodologies for digital materials. • Present the importance of copyrights in digital content production. • Use materials that encourage production such as podcasts, videos, animation, etc. • Present and teach how to use Creative Commons. • How to practically use digital content tools to produce materials and share them with colleagues and teachers in distance learning. • How to practically use tools within the VLE that enable the production of digital materials. • Share original materials produced with colleagues and teachers in the VLE. • Use evaluation and self-assessment questionnaires for production. • Use materials that allow for reflections on User Experience (UX). • Use steps from active methodologies such as gamification or design thinking for the production of materials. • Produce audiovisual content for web communication. • Share the materials developed and interact with others in social networks or virtual learning environments.
PS Data.	**Removed: 1 PS.** **Added: 5 PS.** **Final Total of PS: 12.**
Data Protection	• Present the possible ways to protect data in social networks and specifically

DC	in VLE. • Learn and discuss Internet data protection legislation (https://brasilpaisdigital.com.br/saiba-mais/legislacao-sobre-dados-no-brasil/). • Present Creative Commons and how it is used. • Present the importance of copyrights in digital production. • Develop an e-book to share the "Best Practices" for data protection and information security management. • Present and discuss fake news and spam on social networks, groups, and VLE. • Create self-assessment questionnaires on practices adopted to protect individual data in the network.
PS Data.	**Removed: 1 PS.** **Added: 4 PS.** **Final total of PS: 7.**
Networking CD	• Promote a debate on the impact of Information and Communication Technologies on education. • Promote activities that enable sharing materials. • Create spaces and develop group activities to enable collective coexistence. • Include forums for discussing transversal themes on the topics covered. • Use stages of active methodologies that allow for the creation of groups such as Think Pair Share, Project Based Learning, Gamification, and others. • Develop an e-book to share the "best practices" for data protection and information security management. • Discuss digital technologies that favor exchange and coexistence through digital social networks, as well as their impacts on society. • Use collaborative and cooperative tools such as whiteboards (Padlet), Infographics (Canva), and others. • Create virtual spaces for group communication such as videoconferencing (Google Meet, Zoom, MConf, and others), groups on WhatsApp, etc.
PS Data	**Removed: 1 PS.** **Added: 5 PS.** **Final total of PS: 9.**
Virtual Resilience CD	• Develop virtual resilience by using collaborative writing tools. • Present virtual resilience and its impact on life. • Create cases that bring situations of dissatisfaction or demotivation in the

	VLE so that students can discuss possible ways to overcome these virtual challenges. ● Request sharing materials in the VLE. ● Create social groups so that students can have a space to communicate and interact outside of the educational environment. ● Present problem situations so that students can collectively discuss and solve current problems. ● Include forums for discussing transversal themes on the topics covered.
PS Data	**Removed: 0 EP.** **Added: 3EP.** **Final total of PS: 7.**
Teamwork DC	● Develop activities that enable the "Digital Hackathon", the programming championship. ● Use stages of active methodologies that allow the creation of groups such as Think Pair Share, Project Based Learning, Gamification, and others. ● Present and discuss good etiquette practices (netiquette) in the VLE. ● Promote activities that enable sharing materials. ● Develop group activities for collective coexistence. ● Create social groups so that students can have a space for communication and interaction outside the educational environment. ● Collectively create a group work "contract" so that all participants can understand their duties and rights. ● Use collaborative and cooperative tools such as whiteboards (Padlet), Infographics (Canva), among others. ● Create virtual spaces for group communication such as videoconferencing (Google Meet, Zoom, MConf, and others), groups on WhatsApp, etc. ● Request sharing materials in the VLE. ● Present case studies that enable students to reflect on the importance of conflict management in group work.
PS Data	**Removed: 0 PS.** **Added: 4 PS.** **Final total of PS: 11.**

Source: The authors (2020).

It is worth mentioning that of the 5 digital fluency competences, only content production, data protection, and virtual resilience were considered to be "not important", receiving a maximum of 2.2% of the votes, corresponding to 2 people. New pedagogical strategies were also suggested. The digital fluency DCs for distance learning therefore totaled 46 strategies divided into specific competences. There are a variety of

elements that cover the use of VLE DT as well as specific methodologies that can contemplate the construction of each DC.

6. Conclusion

This article identified pedagogical strategies that can contribute to the construction of the digital fluency competence in the DL context. The study was carried out in three phases. In the first, 28 Pedagogical Strategies were elaborated by the postgraduate authors. In the second, the PS were evaluated by 90 DL professors who have experience in the use of digital technologies. In the third, the information from the questionnaires applied in the second phase, were analyzed in a qualitative way based on an interpretative approach. Thus, it was necessary to examine the data of the suggestions and observations made by the 90 participants when answering the questionnaire so that it was possible to carry out reflections and changes pointed out in the PS developed. Therefore, the responses were categorized into: a) Profile of the participants; b) Evaluation of digital fluency competences and; c) Evaluation of PS for digital fluency DC. Thus, there were a total of 46 pedagogical strategies for the digital fluency DC for distance learning that were divided into specific competences. It is possible to perceive a variety of elements that dialogue between the use of VLE DT, or beyond it, as well as specific methodologies that can contemplate the construction of each DC. Thus, this work is intended to contribute to improving the quality of the interactions between teachers and students, and also to strengthen these bonds in favor of the teaching and learning process.

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