Informatics in Education, 2022, Vol. 21, No. 4, 571–588

DOI: 10.15388/infedu.2022.23

Pedagogical Strategies Based on Socio-affective Scenarios: An Outlook Based on Personalized Teaching in a Virtual Learning Environment

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Received: April 2022

Abstract. The objective of this article is to present the creation process of Pedagogical Strategies (PS) based on Socio-affective Scenarios mapped in a Virtual Learning Environment (VLE). Every year, enterprises are looking for new technologies that can improve the skills of their collaborators, bringing VLE resources to e-training formations. The PSs are actions carried out by professors or manager in their practice, both for e-learning and e-training. In order to develop a PS, it is important to consider the socio-affective profile. For data inference were used: Social and Affective Map. Using these two tools, 38 Socio-affective Scenarios were mapped and their strategies were developed. This study utilizes an applied qualitative approach. As a result, a total of 228 PSs based on Socio-affective Scenarios were developed by 15 specialist professors. Its main contribution is the creation of PS based on criteria that can be adapted to be applied in the industry context.

Keywords: pedagogical strategies, social-affective scenarios, virtual learning environment, enterprises.

1. Introduction

Distance Education (DE) and e-training, over the last ten years, has been transforming and, consequently, increased the offer of virtual courses with the aim of taking education to all corners of Brazil and contexts, whether business or school (Brazilian Asso-

ciation of Distance Education, 2019). These modalities bring flexibility regarding time and place of study, however, hinders physical interaction between those involved in the teaching-learning process. Thus, as they are increasingly investing in technologies that can be made flexible and maximized as capabilities, since "resource management is a priority over any other human resource, such as machines, equipment, facilities" (Bassi *et al.*, 2019, p. 171). In this context, the challenges to follow each person development in this modality are great, being necessary to develop and apply different strategies to increase the success rates in DE (Câmara, 2016).

Distance Learning demands more autonomy from students since they have to access the Virtual Learning Environment (VLE), manage their study time and contact the professor in case of difficulties/doubts. Thus, in this teaching modality, it is more difficult for the professor to identify students' moods and their social interactions. Therefore, professors need to adopt practices that can make the classes more dynamic, develop cognitive, social and affective aspects in the DE environment so that students feel welcome and minimize the distance barriers within the group (Almeida, 2018).

In this sense, it is possible to use Pedagogical Strategies (PS) as a way to support professors in their practice in the context of business training (e-training). The PSs are understood as a set of actions aimed to achieve objectives that promote knowledge building. They are influenced and modified according to the needs identified in a given context (Behar *et al*., 2019).

Thus, this study starts from a reflection on Social-affective aspects evidenced in VLEs. Considering this context, the objective of this research is to present the creation process of PSs based on the Socio-affective Scenarios mapped in the VLE Cooperative Learning Network (in Portuguese: ROODA). In this investigation, the Scenarios are understood as the intersection between the indicators of the Affective Map (AM) and the Social Map (SM) in which the use of PSs that can contribute to support the learner's needs is relevant. Therefore, the professor and/or tutor can intervene according to the profile, context, and demands of the persons.

The article is organized in six sections. The second section discusses the VLE ROODA and the AM and SM. The third debates the concepts of PSs in the educational area and in the industrial context. The fourth describes the research methodology. The fifth presents the results and the sixth makes some conclusion.

2. Virtual Learning Environment ROODA: Social and Affective Maps

The VLE ROODA was created in a Brazilian Public University by Patricia Alejandra Behar in 2000, following constructivist principles, within Jean Piaget's (1973) interactionist epistemological conception, in order to encourage a cooperative process. Ribeiro (2019, p. 52) points out that "*[...] the basis theory of the constructivist epistemological conception understands that the persons build their knowledge based on their actions on themselves, with other persons, with objects and with the environment*".

ROODA is a free software, centered on the user, it enables students to access materials, interaction functionalities, synchronous and asynchronous communication, as well

as exchange and send activities. The VLE used in this study was ROODA, since it is one of the official platforms of the Federal University of Rio Grande do Sul (UFRGS/ Brazil), therefore allowing data collection of the teaching activities (courses, disciplines and extension projects) and the analysis of the performance of users through Social Map (SM) and Affective Map (AM).

The SM and AM are used to identify the social and affective aspects of students and are resources used exclusively by professors to graphically visualize the aspects manifested by the participants in the VLE ROODA. Data is obtained from communication resources such as Chats, Contacts (similar to E-mail), Forums and comments inserted in the Web Portfolio and Library (Behar *et al*., 2019; Longhi, 2011).

The SM presents the relationships in the VLE through the display of sociograms, that is, graphical representations of the social interactions of a group in the environment, enabling the visualization of the position of individuals in the group and the core of relationships that are simultaneously formed around them (Behar *et al*., 2019). Thus, by means of a sociogram, one can perceive the social position of each participant and its relationship with the rest of the group (Longhi, 2011) through the calculation of the degree of each person social indicator: Absence, Collaboration, Feelings of separation from the class, Drop out, Informal Groups and Popularity (Barvinski *et al*., 2019), as illustrated in Fig. 1.

The definition of the six Social Map indicators:

1. **Absence**: the person logs into the VLE and does not reply the group's (professors, tutors and students) requests.
2. **Collaboration**: the user contributes by sharing files, content, images, pages and links.
3. **Feelings of separation from the class**: the student sends messages and publishes in the VLE, but does not receive response from peers.
4. **Drop out**: the student never accessed the teaching activity in question, not establishing exchanges.

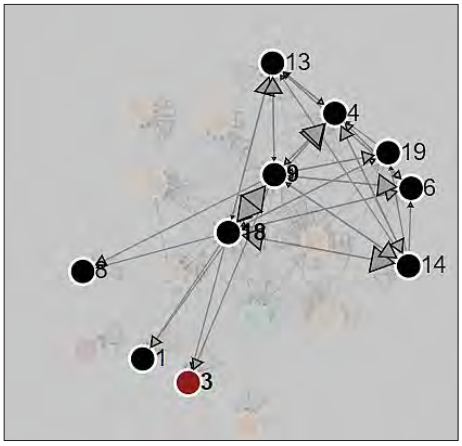

Fig. 1. Social Map. Source: `https://ead.ufrgs.br/rooda/`

5. **Informal Groups**: the student exchanges messages with three or more classmates and through these exchanges we can observe the existence of groups among the participants.
6. **Popularity**: the subject keeps higher frequency interactions compared to other group members, based on an average among all participants.

Therefore, the SM can contribute to the teaching process in the sense of analyzing and monitoring participants drop outs. The AM recognizes moods through the identification and interpretation of subjectivity in texts written by students in ROODA's functionality. Thus, the AM filters words and/or emoticons with affective connotations (Behar *et al*., 2019; Longhi *et al*., 2009). The functionality has a circular format in which there are four opposite poles: Animated, Discouraged, Satisfied and Dissatisfied. This inference is made by means of a Bayesian network, which is a knowledge representation model, in the form of a semantic network, used to predict or generate a plausible explanation for a set of observations (Longhi, 2011), as shown in Fig. 2.

The first quadrant, clockwise, from right to left, Satisfied, indicates that the student expresses joy, enthusiasm, satisfaction and pride for accomplishing the task. The second, Animated, evidences that, within the affective family, the student demonstrates hope, interest, serenity and surprise to face the learning challenges. The third, Discouraged, suggests that the learner demonstrates or represses guilt, fear, shame and sadness for not being able to follow the content. And, lastly, Dissatisfied students express or try not to show irritation, contempt, aversion, and envy (Longhi, 2011).

Thus, the various functionalities that constitute ROODA are fundamental as pedagogical spaces because it is through them that the professor can boost the teaching activity, give support to students and mediate the educational process in order to promote learning. The communication tools of VLE ROODA, besides supporting these actions, also allow relationships to be established between DE students, whether cognitive, affective or symbolic, which arise in response to the strategy adopted by the professor. However, for this to occur, a methodological change is required, which means understanding learners' profile and proposing PSs that can put them at the core of the teaching and learning process (Ribeiro, 2019), as explained below.

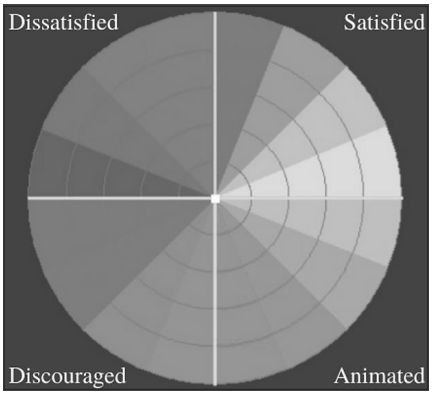

Fig. 2. Affective Map. Source: `https://ead.ufrgs.br/rooda/`

3. Pedagogical Strategies in the Educational Area

Pedagogical Strategies (PS) do not have a basic theory defined in the literature, there are several explanations that are generally very comprehensive or are related to certain teaching paradigms. The PSs contemplate numerous visions, as they can refer to methods, techniques and practices that act as resources with the purpose of achieving pedagogical objectives.

For Amaral (2017) the PS can be suggestions for the use of digital technologies, applications of complementary activities, collective writing, recommendation of hints to motivate tasks, among others. The use of PSs can instigate interactions, synchronous and asynchronous communication available in a VLE, promoting dialogue, collaboration, cooperation, active participation and autonomy of persons. For this purpose, different techniques can be used, such as the observation of social interactions, application of questionnaires and questions, among others.

According to Ribeiro (2019), when professors define or rework PSs, according to the students' context, they are able to minimize the difficulties that often occur in VLEs. The resulting impact, which can be positive or negative, is marked by the closeness, or distance, between the individual (student) and object (content). Thus, when they result in negative feelings, such as Feelings of separation from the class, Discouragement or Dissatisfaction, these influence students' actions, and may trigger learning stagnation or a more drastic decision, Drop out.

From this perspective, the development of PSs should have as its main focus the understanding of the participant learner in a teaching activity and the goal to be achieved. In this context, the creation of PSs demands constant reflection and sensitization to the intended objective. According to Amaral (2011), when a professor elaborates ways to achieve an objective, he is building strategies. The author highlights the importance of considering the previous development and context of the participants, mainly, the Socio-affective aspects. Therefore, we believe that only by observing students' behavior the professor can act in a more personalized manner and formulate more appropriate PSs, addressing the individual needs of each student. Bassi, Costa, Gasparotto (2019, p. 171) point out that "with the development of human relationships, in addition to the technical need to train the professional, it is no longer possible to conceptualize the collaborators as a person who only seeks his salary and nothing more, there are several other needs that the human being has and seeks to satisfy them. This is one of the reasons that it becomes necessary in addition to technical training to have interpersonal relationships and the integration of the individual with the organization as its object". In this respect, Barvinski (2020) established a set of criteria to be followed for a strategy to be considered appropriate in terms of structure, language and direction for the actions, exemplified in Fig. 3.

The definition of the criteria for the elaboration of PS are:

1. **Action**: indicate the action to be taken by the tutor or professor.
2. **Resources**: indicate the resources that can be used to carry out the action. In this research, these are the functionalities used: Chat, Contacts, Diary, Forum, Library and Web Portfolio.

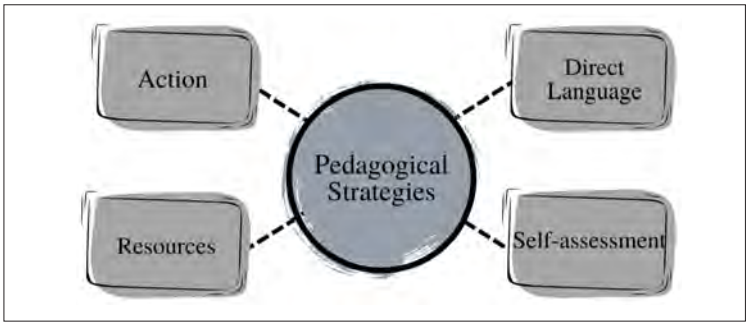

Fig. 3. Criteria for the elaboration of Pedagogical Strategies.
Adapted from Barvinski (2020).

3. **Direct Language**: use direct language, having as subjects the professor and the tutor.
4. **Self-assessment**: suggest that professors make a self-assessment of their pedagogical performance, checking the points of their practice that contribute to the students' Socio-affective situation (if positive) or to restructure the activities and contents aiming to reverse students' negative valence.

In this context, four studies were found that deal with the PS theme: Longaray (2014), Barvinski (2020), Sampaio (2020) and Akazaki, Machado and Behar (2022). Longaray (2014) proposed to create strategies to help the professor when faced with the affective phenomena that students manifested in the synchronous and asynchronous communication functionality of a VLE. The work was carried out in three stages, namely: 1) definition and planning; 2) content analysis and collection and; 3) discussion of the data. The first subsidized the construction of the theoretical framework and presented the characteristics of the analyzed subjects. In the second, the definition and stages of Content Analysis were visualized. In the last one, Pedagogical Strategies were elaborated and the pilot case study was described, which focused on observing the manifestation of affective phenomena in the Affective Map functionality. In this way, from the analyzed data, it was possible to perceive that the professors reported using the content that the strategy suggested to take attitudes towards their students.

On the other hand, the research by Barvinski (2020) investigated how to build a Recommendation Model that would integrate Pedagogical Strategies (in Portuguese the acronym: MREPSA), from the Socio-affective aspects of the student in VLE. She analyzed the student in ROODA through the Affective Map and Social Map functionality, building a Socio-affective profile of the student separately, that is, considering the affective, social and personality attributes without making a correlation between them. The author pointed out that the recommendations provided were relevant to the Socio-affective states of the students, that the suggestions were appropriate and useful as a support tool for the professor. She also highlighted that the MREPSA can serve to develop new approaches to recommendations based on Socio-affective aspects, and can contribute to professors being able to give more personalized attention to the social and affective needs of their students in the VLE.

Sampaio (2020) research involved the construction and recommendation of PSs based on the Social Map social interactions. The investigation focused on the creation of PSs for the elderly public.

The work of Akazaki, Machado and Behar (2022) proposed a mapping of Socio-affective Scenarios, from the AVA ROODA using Learning Analytics (LA). The authors report that LA can help professors understand student learning based on their Socio-affective profile and, above all, allow professors to create adequate Pedagogical Strategies, considering the needs of each individual. However, in this study, PSs were not elaborated, only the Socio-Affective Scenarios were crossed.

Therefore, these studies are important because they deal with the analysis of social and affective aspects, as well as the creation of PS.

However, it could be observed that, in spite of having many strategies and functionalities (synchronous and asynchronous) that are available to professors to motivate their classes, the main reasons to use them are communication and social interaction (Palácio and Struchiner, 2016). Therefore, it is the professor's responsibility to promote students' interaction, encouraging them to explore didactic materials and exchange with classmates, besides providing feedback in the activities and using strategies that promote the learners' autonomy. This form of conducting classes, by the educator, aims to build close and reliable relationships, share emotions and experiences, foster interaction and communication, which are determining factors for the success or failure of students' knowledge building process (Lopes and Silva, 2019).

Next, the concepts of Pedagogical Strategies in the industrial context are discussed.

3.1. *Pedagogical Strategies in the Industrial Context*

The industrial sector is formed by a market that values people who have the skills to work as a team, solve problems with innovative ideas and technical preparation to use technologies (Barduni Filho and Figueiredo, 2020). On the other hand, the company can create a respectful and collaborative environment, showing the importance of human capital and improving working conditions to enable an increase in its economy (Almeida and Costa, 2012). In this context, the business pedagogue can help with practices that structure and restructure relationships between employees. According to Prado, Silva and Cardoso (2013) the business pedagogue:

> *"Currently, this professional has been able to open up his space with organizations in order to promote projects, solve problems, formulate hypotheses and also aim to improve the service offered by the company. [...] business pedagogy has been taking on new organizational scenarios delimited by the organization, executing good projects and training for a new personnel management base. This allows a renewal in the spirit of the employees and in the development of the company, promoting transforming attitudes and thus directing the business, aiming to reach the demands of the market and current society. [...] Thus, the pedagogue is of paramount importance in the*

> *business environment, as he will analyze and direct employees and the company towards objective improvements."* (Prado, Silva and Cardoso, 2013, p. 1)

The main function of business pedagogy is to qualify professionals in different sectors working in human resources to articulate strategies and develop engagement and motivation. In addition, it can investigate the needs and deficiencies of the teams so that projects are developed with a focus on their improvement (Prado, Silva and Cardoso, 2013). According to Claro and Torres (2013, p. 210) "Companies, in order to gain the commitment of their employees and ensure that everyone unites around the same purpose, must have their organizational culture well rooted. This culture represents the vision, mission and values of the company." Thus, it is essential that employees have in-depth knowledge of the principles of the company in which they operate.

The company can invest in its personnel by bringing educational processes to the organization with the presence of the business pedagogue. It will be able to adopt innovative methodologies and strategies, encompassing the interaction between the entire business community, being it the possible place of collaboration in the design of the PS. The PS can be used considering the cooperation of different areas for a real practical applicability and, thus, to minimize the evasion in e-trainings. The industry must have a business pedagogue, who participates as a mediator in different groups of employees. In the groups, with employees from different sectors and hierarchy, there would be a division by pairs, each one containing a member from a different sector that complements each other. Then the pairs could create the PSs based on the four proposed criteria (action, resources, direct language and self-assessment) according to company principles. The feature element can be accomplished using digital technologies such as Trello (`https://trello.com/`), Google Keep (`https://keep.google.com/`), Google Meet (`https://apps.google.com/meet/`), or a system used in company. In this process, the business pedagogue brings discussions about the importance of including Socio-affective aspects within the Pedagogical Strategies, approaching the needs of the industry. The objective is to outline strategies that can bring employees together, enabling increased productivity in companies, by considering the individuality of each subject through social and affective aspects.

In the industrial context, four recent studies were found related to the topic of strategies, namely: Costa, Santos and Oliveira (2022); Jesus and Silveira (2022); Šabić, Baranović and Rogošić (2022) and; Veerasamy, Laakso and Souza (2022).

Costa, Santos and Oliveira (2022) proposed the development of a framework containing a package of policies and initiatives for industry, government and academia. This was elaborated through a systematic review. Its contribution was to make it possible to increase access to quality education through Education 4.0.

In the study by Jesus and Silveira (2022) a strategy was designed to address the fundamental characteristics of the concept of Collaborative Learning. This was applied to high school students through a programming workshop with digital games.

In the work of Šabić, Baranović and Rogošić (2022) it was suggested that strategies to improve self-efficacy in information and communication technologies should be particularly targeted towards older professors. This research contributed to increasing

understanding of gender differences in teacher self-efficacy in information and communication technologies.

The investigation by Veerasamy, Laakso and Souza (2022) presented as a strategy an indicator of student engagement and its potential application as a progress monitor for early identification of students at risk of dropping out.

Therefore, in the search for recent research carried out in the industrial area, no work was found that addresses the theme of Pedagogical Strategies, mainly focusing on companies. In this context, studies were found with the theme of strategies, but linked to Collaborative Learning, self-efficacy and engagement. Therefore, despite the importance of approaching the Strategies and being a current theme, no research was found that considers the Socio-affective aspects, showing the innovation of this work.

Thus, considering the Social Map, Affective Map and Pedagogical Strategies, the methodology used to carry out the research is presented below.

4. Methodology

The objective of the research is to present the creation process of PSs based on Socio-affective Scenarios mapped in a VLE. The methodology utilized in this study has an applied qualitative approach. The choice for this approach is due to the fact that the object of the research involves Socio-affective Scenarios that are inferred in the ROODA, subjectively expressed through the exchange of messages, texts and the relationship between the participants.

The target audience were students who participated in distance training. Data collection was obtained from the interaction and technological production in ROODA, from the first semester of 2019 to the second semester of 2020, in ten case studies (seven disciplines and three courses), totaling 219 students, as shown in Table 1.

Table 1
Mapping of case studies

Case Study	Teaching Activity	Modality	Period	Number of students
1	Graduation A	Hybrid	1st/2019	16
2	Graduation B	Classroom	1st/2019	16
3	Graduation A	Hybrid	2nd/2019	10
4	Graduation B	Classroom	2nd/2019	21
5	Graduation A	Hybrid	1st/2020	14
6	Post-Graduation A	Hybrid	1st/2020	23
7	Post-Graduation B	Hybrid	1st/2020	6
8	Course A	Distance	2nd/2020	27
9	Course B	Distance	2nd/2020	48
10	Course C	Distance	2nd/2020	38
Total of students				219

After data analysis, 38 Socio-affective Scenarios were created from the mapping of social indicators and moods, as illustrated in Table 2.

Table 2
Mapping of Socio-affective Scenarios

Sce-nario	Affective Indicator		Social Indicator	
C1	Animated	Absence	-	-
C2	Animated	Collaboration	-	-
C3	Animated	Feelings of separation from the class	-	-
C4	Animated	Informal Groups	-	-
C5	Animated	Popularity	-	-
C6	Animated	Absence	Collaboration	-
C7	Animated	Collaboration	Feelings of separation from the class	-
C8	Animated	Collaboration	Informal Groups	-
C9	Animated	Collaboration	Popularity	-
C10	Animated	Informal groups	Popularity	-
C11	Animated	Collaboration	Informal Groups	Popularity
C12	Discouraged	Absence	-	-
C13	Discouraged	Collaboration	-	-
C14	Discouraged	Feelings of separation from the class	-	-
C15	Discouraged	Popularity	-	-
C16	Discouraged	Absence	Collaboration	-
C17	Discouraged	Collaboration	Feelings of separation from the class	-
C18	Discouraged	Collaboration	Informal Groups	-
C19	Discouraged	Collaboration	Popularity	-
C20	Discouraged	Informal Groups	Popularity	
C21	Discouraged	Collaboration	Informal Groups	Popularity
C22	Dissatisfied	Absence	-	-
C23	Dissatisfied	Collaboration	-	-
C24	Dissatisfied	Absence	Collaboration	-
C25	Dissatisfied	Collaboration	Feelings of separation from the class	-
C26	Dissatisfied	Collaboration	Popularity	-
C27	Dissatisfied	Informal Groups	Popularity	-
C28	Dissatisfied	Collaboration	Informal Groups	Popularity
C29	Satisfied	Absence	-	-
C30	Satisfied	Collaboration	-	-
C31	Satisfied	Feelings of separation from the class	-	-
C32	Satisfied	Informal Groups	-	-
C33	Satisfied	Popularity	-	-
C34	Satisfied	Absence	Collaboration	-
C35	Satisfied	Collaboration	Feelings of separation from the class	-
C36	Satisfied	Collaboration	Popularity	-
C37	Satisfied	Informal Groups	Popularity	-
C38	Satisfied	Collaboration	Informal Groups	Popularity

Fig. 4. Quantity of Pedagogical Strategies elaborated based on Socio-affective Scenarios. Adapted from Barvinski (2020).

Considering the 38 Scenarios, a strategy was created for each of the six functionalities used to generate the SMs and AMs (Chat, Contacts, Diary, Forum, Library and Web Portfolio), totaling 228 PSs, presented in Fig. 4.

In this sense, the 228 PSs, based on Socio-affective Scenarios, were developed. The Pedagogical Strategies based on these Scenarios were elaborated by a group composed of 15 professors specialized in DE with a post-graduate training and experience in ROODA. For its development, Barvinski's (2020) set of criteria were followed so that the PS was considered adequate in terms of structure, language and direction of actions (action, resources, direct language and self-assessment).

The process for creating the PSs based on Socio-affective Scenarios lasted 8 months, beginning on March 22, 2021 and ended on October 11, 2021. During this period, 5 meetings took place in a synchronous video-conference platform, in which the participants brought doubts, questions, observations and reports on the creation of the strategies. The 228 PSs were divided among the 15 professors, totaling 15 for each. One of the specialists was left with 3 more to do, because the result of the division did not add up. For its development, an online spreadsheet was made available, to which all participants had access to edit. It had four tabs: Satisfied, Animated, Discouraged, and Dissatisfied, and each tab had seven columns:

1. **Description of the indicator**: in this field, the meaning of each indicator was written. For example: "Animated": This indicator refers to the student who shows a confident disposition to explore, develop and continue learning. However, it might indicate a negative connotation: being too relaxed can induce the student to give up, being too hopeful can lead to disengagement, being too interested can cause dispersion, and being overly surprised can trigger confused ideas. The same process was done for the indicators Discouraged, Satisfied, and Dissatisfied.
2. **Variables**: they correspond to the Chat, Contacts, Diary, Forum, Library and Web Portfolio functionalities.
3. **Ifs (affective indicator) and (social indicator) and (functionality) and (age value)**: this column included the "ifs", called proposition logic or "if then", which is a truth table in which the combinations were made. In the case of the first strategy, this field was as follows: If (**A**nimated) and (**A**bsence) and (**c**hat) and ($I \leq 59$), strategy **AAc1** was recommended. It should be noted that the age value is less than or equal to 59 years old since the elaborated PSs considered

aspects related to adults only and not to elderly, in Brazil, an age group above 60 years old.

4. **Id PS**: this is the abbreviation of the initials of the affective and social indicator, functionality and strategy number. For example: **A**nimated, **A**bsence, **c**hat, and strategy number **1** became AAc1.
5. **Socio-affective PS**: this field should be filled in by a specialist with the description of the PS.
6. **Name**: in this column professors should write their name on the PSs they would like to elaborate.
7. **Status**: this column should be filled in by the professors themselves, indicating if the strategy was or was not done. In case the activity was done, they should write "ok". If not, they should write "to do".

After the spreadsheet was available, the participants who had built the PSs individually would develop the PSs based on the Socio-affective Scenarios, as shown in the next section.

5. Results

The 15 specialists were responsible for a specific number of PSs, however, the amount they should perform month by month was not defined. During the PSs, the description of the indicators Ifs (affective indicator) and (social indicator) and (functionality) and (age value): "If (Animated) and (Absence) and (chat) and ($I \leq 59$) then strategy AAc1 is recommended". This is an example applied to all PSs, only changing the functionality in the indicator description. However, this change transforms the entire PS as it modifies the action. Below is a PS example for the "Chat" functionality in the "Animated and Absence" Socio-affective Scenario. Therefore, for this Scenario, the functionalities are modified for the other 5 PS, namely: Contacts, Diary, Forum, Library and Web Portfolio, shown in Table 3.

This same process occurred for all the other strategies, which are available at the link: `https://drive.google.com/file/d/1pBFtsLGJ9kRV1S2-25RcKt4nr3dlyp1J/view?usp=sharing`. It should be noted that the PS are in the Portuguese language of Brazil, since it is a study specifically applied in the country.

During the process of building the strategies, some adversities were identified, especially in adapting the functionalities to meet the profile mapped in the Scenarios, as well as their combinations. Thus, in some occasions, the specialists who developed the PSs had difficulties understanding the combination of the Scenario, as, for example, in the case of Discouraged and Collaborative. In this example, the profile refers to a participant who, despite sharing materials with classmates, is probably not receiving feedback (interaction) that he/she considers interesting for the contents being attended. It is also pertinent to highlight the complexity in creating a variety of strategies, since many were developed, and, sometimes, some of them seemed similar to each other.

Therefore, despite all the challenges encountered, it can be observed that by knowing the Socio-affective profile of the participant in e-training, the professor can apply

Table 3

Pedagogical Strategies created for the Animated and Absence Socio-affective Scenario

Scenario Socio-affective Animated and Absence	Socio-affective Pedagogical Strategies
Chat	The student seems to be Animated and Absent. With these characteristics, it is likely that the student, despite being Animated, makes little use of the communication functionalities of the environment. One possible way to increase his interaction is to instigate him to perform social exchanges with his classmates through synchronous communication in a Chat room. This strategy will enable the student to share interests, confidence and anxieties with peers, allowing for an approximation with other students, besides the possibility of analyzing the reasons that led to his/her absence in the VLE. It is important that after the application of the PS you perform a self-evaluation of the process and adopt, if necessary, new appropriate actions to the student's profile.
Contacts	The student seems to be Animated and Absent. It is likely with these characteristics that the person, despite being Animated, makes little use of the communication features of the environment. The Contacts functionality allows you to maintain a direct approach to this student. You can use Contacts to send an individual message to the subject encouraging their participation in other functionalities, asking them to present their considerations and points of view. It is important that after applying the PS you carry out a self-assessment of the process and adopt, if necessary, new actions appropriate to the student's profile.
Diary	The student seems to be Animated and Absent. It is likely that despite the student being Animated, he uses little of the communication features of the VLE. The Diary functionality, which is a space for informal reports, allows you to maintain a closer relationship with this student. You can use the Diary to encourage them to write in "private" mode the reason that led to their absence from the VLE, so, based on their response, you can encourage their interaction. It is important that after applying the PS you carry out a self-assessment of the process and adopt, if necessary, new actions appropriate to the student's profile.
Library	The student seems to be Animated and Absent. It is likely with these characteristics that the person, despite being Animated, makes little use of the communication features of the environment. The Library can be a space for sharing as well as interaction. You can ask the class to search, select and post material on the topic studied by inserting a short description. After posting, use the Contacts functionality to send a message that encourages the student to access and comment on the material provided by other colleagues. It is important that after applying the PS you carry out a self-assessment of the process and adopt, if necessary, new actions appropriate to the student's profile.
Web Portfolio	The student seems to be Animated and Absent. It is likely with these characteristics that the person, despite being Animated, makes little use of the communication features of the environment. The Web Portfolio is an important resource in the process, as through the "visible to all" sharing option, colleagues can exchange comments on the posted files. You can ask that student to review the class material on the Web Portfolio and comment. This type of strategy may be associated with the use of an active methodology, such as peer review. It is important that after the application you carry out a self-assessment of the process and adopt, if necessary, new actions appropriate to the student's profile.

PSs individually or for the group, in order to try to change the Scenarios in which the indicators have negative poles, such as Discouragement, Dissatisfaction, Absence and Feelings of separation from the class. The professor can also use strategies as a way of engaging in training that does not always have a significant number of subscribers, since, in many companies, there is an obligation to participate.

It should be noted that this study has not yet verified the application of PSs and their relationship with the students' learning process. This will be the next stage of the research. In this context, a total of 228 PS were applied, 83 of which were considered the most relevant and corresponded to the Socio-affective profile of the class in two disciplines of the degree, in the distance modality. Subsequently, six professors and three monitors answered an online questionnaire pointing out changes in the application. The results indicate the need to create a functionality that makes the automatic analysis of Socio-affective Scenarios and indicates the corresponding PS to the professor. In addition, the importance that the PS had to intensify interactions and exchanges in the VLE was highlighted, as well as the personalized monitoring by professors and monitors. This article is available at the link: `https://helmeto2022.unipa.it/`.

In this way, the construction of PS will help in school education, but mainly in training in the industrial environment in order to accompany the social and affective aspects of collaborators and, thus, meet their specificities.

6. Conclusions

In e-training, the physical distance between the actors of the process makes their relationships unique. Given this context, the ways of knowing the other, communicating and acting in a Virtual Learning Environment (VLE) are elements of analysis for continuous qualification. Thus, given their particularities, the relevance that social and affective processes play on learning in company training must also be considered. In this Scenario, dialogic mediation creates space for meaningful exchanges and manifestation of affectivity, both of which are essential for learning. In this way, considering the needs of each collaborator, when adopting Pedagogical Strategies (PS) can be an instrument to support the professor, allowing the personalization of teaching and learning. Therefore, it is advantageous for professors to promote pedagogical practices that are more sensitive to the industry paradigm and its needs, by meeting the individual interests of its participants, expanding the possibilities of innovating their classes and using different technological resources in the VLE.

The research developed by the authors Longaray (2014), Barvinski (2020), Sampaio (2020) and Akazaki, Machado and Behar (2022) are important because they deal with the concept of Pedagogical Strategies, but in none of them were the social and affective aspects found united. Differentiating from this work. On the other hand, in the industrial scenario, the investigations by Costa, Santos and Oliveira (2022), Jesus and Silveira (2022), abić, Baranović and Rogošić (2022) and, Veerasamy, Laakso and Souza (2022) deal with the topic of Strategies, but focused on indicators, self-management and engagement, or on active methodologies, Collaborative Learning. These do not address the actions that PSs should bring and how to apply them in the industrial context.

The contributions of this work include the 38 Socio-affective Scenarios mapped in 10 case studies and the respective elaboration of 228 PSs for the 6 functionalities used to analyze social interactions and affectivity. For the industrial environment, it is possible to develop customized PSs according to the context of each company, based

on the criteria proposed for their creation presented in this study. In this way, the adoption of strategies that address the individual needs of each person, considering their Socio-affective aspects, can be a significant instrument of support for the professor or manager, since they allow the personalization of the teaching and learning process and the training of companies. In addition, by using the PS it is possible to build knowledge, expand the possibilities for innovation and use of technological resources, and share information.

The limitation of this study concerns the possibility of identifying other Socio-affective Scenarios and, consequently, other Pedagogical Strategies, besides the ones identified here. Variation can occur when different functionalities are used in different situations.

The possibility of future research is related to the application of Pedagogical Strategies in more e-training activities in companies to verify their validity. In this context, it is also plausible to create a functionality that automatically analyzes the Socio-affective Scenarios and indicates the corresponding Pedagogical Strategies so that the professor can, if he wants to, apply it in his context.

Acknowledgments

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001.

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