

Affective and social aspects in Distance Education: the interdisciplinarity in focus

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Abstract

This article presents an analysis of the possible contributions of the affective and social aspects to the development of pedagogical practices in the modality of Distance Education. The interactions of students in a Virtual Learning Environment (VLE) were observed and identified based on the use of specific instruments of affective and social analysis. The aim is to assist the teacher in the development of his pedagogical practices carried out through an VLE. The methodology used was the qualitative developed in a discipline at a public university in the south of Brazil in 2018. Twelve undergraduate students from different undergraduate courses participated in the study. The data were extracted from the Social Map and Affective Map tools available in ROODA VLE, used in the discipline. These tools enable a mapping of the student's affective and social profile, from the productions and interactions of the students in the VLE. The results point to the relevance of the support that the information provided by the maps can provide to the teacher. In this sense, they contribute to the decision of pedagogical practices, since they can corroborate the strategies adopted by the teacher or they can base the (re)orientation of the proposed activities in order to meet the affective and social demands of each student. The data obtained provided, in addition to a more in-depth discussion on the subject, the development of new resources as a system of recommendation of pedagogical strategies based on the social and affective aspects of the student.

Keywords: *Affectivity; Social interaction; Distance Education; pedagogical practices;*

INTRODUCTION

This article presents an analysis of the possible contributions of the affective and social aspects to the development of pedagogical practices in the modality of Distance Education. It is considered, in the field of Education, the realization of investigations about the influence that the affectivity and social interaction exert in the learning, being able to interfere significantly in its results.

In the Piagetian theory, thinking and feeling are inseparable and, in this relation, affection acts as a propellant or decelerator of learning. In the first case, if the individual establishes a relationship of affectivity with the object, he arouses his interest in learning. In the second, the lack of ties preponderates the lack of interest. In this way, the prospects for gaining new knowledge become reduced and learning can be impaired (PIAGET, 1973). According to Piaget (1973), social interactions also play an important role in cognition, acting as accelerators of the process, since they foster the emergence of new cognitive

structures. Thus, success in the development of learning depends not only on the exposure and creation of opportunities for knowledge or on the use of appropriate technological and didactic resources by the teacher, but also on the affective relationships and social interactions that are constructed in the classroom.

In the context of Distance Education (DE), the availability of permanent connection to the classroom, at any time and place chosen by the student, on the one hand promotes access to knowledge, on the other hand can favor the distance between participants in the virtual learning environment (VLE), depending on the pedagogical practice adopted by the teacher. A pedagogical practice can be understood as "[...] everything that implies in actions of the educational actors in the concrete and intellectual plane given in contexts of teaching and learning [...] In this way, the practice approaches a meeting of the actions of the teacher with the students' actions and are understood as the meeting with pedagogical purposes between the educational actors, both in an institution's physical environments and in virtual environments" (AMARAL, 2017, p.51). Thus, a pedagogical practice for DE should consider social and affective aspects in order to include all students' needs in the teaching and learning process.

It is emphasized that following the course of each student in a VLE is a challenge, since the nature of DE hinders the physical and visual contact between teacher and student. In spite of the existing limitations to perform this task, it is essential to observe the course of the student during the activities in a VLE. To do so, it is necessary to provide instruments to the teacher that facilitate this monitoring.

In this scenario, it is pertinent to study the affective and social aspects in distance education. There are some articles that can serve as reference for this research, such as the studies of Longaray, Behar and Longhi (2012); Longhi et al. (2017); Ferreira et al. (2016). These researches pointed out the need to create and use digital tools that can help in the mapping of the affective and social aspects in VLE.

In this sense, tools such as the Affective Map (LONGHI, 2011) and the Social Map (LONGHI et al, 2014), used in this study, provide computational resources that help the teacher to follow the socio-affective trajectory of the student in the ROODA VLE, enabling the pedagogical intervention in response to the demands, both social and affective. ROODA (Rede cOOperativa De Aprendizagem¹) is a VLE institutionalized by the Federal University of Rio Grande do Sul (UFRGS / Brazil). The Affective Map (AM) is a feature of ROODA that points the student's moods (excited, discouraged, satisfied and dissatisfied) through the analysis of their performance in VLE communication tools. To do so, it articulates concepts from different areas, such as affective computing, personality traits, psychology, Bayesian networks and computer science. The Social Map (SM) (LONGHI et al, 2014) provides information about the social relationships that have been established in the VLE in a given class. The SM provides sociograms based on the analysis of spontaneous social interactions among students, teachers and tutors identified in ROODA synchronous and asynchronous communication tools. In its algorithmic structure, SM applies concepts from the areas of sociometry, social network analysis, graph theory and computer science.

In this article, the subsidy generated by these two maps is analyzed in terms of the possible contributions of the affective and social aspects to the development of pedagogical practices in the modality of Distance Education. Thus, the work is organized as follows: section 2 explores the affective and social aspects related to learning. In section 3, the Virtual Learning Environment used is presented, as well as the

¹ Available on: <http://ead.ufrgs.br/rooda>

Social Map and Affective Map tools. In section 4 the methodology is defined. The development of the case study and data analysis are presented in section 5. Finally, the final section outlines the final considerations.

2. THE SOCIO-AFFECTIVE ASPECTS AND THEIR INFLUENCE ON LEARNING

According to Valente (2005), learning can be understood as the result of an internal process of knowledge elaboration, which involves the interpretation and understanding of information. It is from his personal reality that the individual attributes meaning and unique representation of knowledge, whose progress occurs in an uninterrupted process, due to the expansion of pre-existing cognitive structures or the emergence of others, in the face of the contact of novelties.

However, learning does not depend solely on the contact of the subject with the knowledge, the presence and support of the teacher and the use of resources and appropriate didactics. Within the Piagetian perspective, the affective relationships and the social interactions experienced in the classroom interfere in the learning, contributing either to the evolution or to the paralysis of this process. In his studies, Piaget (2014) has detected that affectivity and cognition are inseparable and influence each other from the birth of the subject, in all the knowledge that he builds throughout life. At the center of this movement is the subject's interest or necessity in exploring the object. When this occurs, a positive affective bond is established that motivates their actions and triggers their learning. However, when the affective relation is negative, there is no attraction or will to learn, consequently, there is no motivation for the search of problem solving and conflicts. In this situation, learning paralyzes.

On the other hand, the construction of knowledge also results from human experiences inside and outside the school environment, through which the individual establishes relationships between what is learned in the classroom and what is experienced in everyday life. Within the Piagetian perspective, the exchanges and significations that take place in an interaction involves a complex process triggering a sequence of states of knowledge construction (PIAGET, 1973). According to Piaget (1973), it is characterized by the existence of social rules, by collective values and by the forms of communication to transmit such rules and values. According to Arantes (2002), values emerge from the affective exchange that the subject realizes with the outside, with objects or people. They result from the projection of feelings about the object and subjects in a process that organizes them cognitively and determines the individual's value system.

In the context of this work, the fact that the DE student has greater freedom, both in choosing the time and place of study, is also a problem generator, if he (1) is not disciplined and mature to differentiate face-to-face education from distance; and (2) does not understand the need to be co-responsible for their learning. It is understood that the difficulty of the student (and often the teacher) to adjust to the teaching method in this modality and to possess certain attributes, such as: autonomy, independence, initiative, persistence, emotional control, motivation, among others, are factors that lead to avoidance. Such behavioral aspects reflect the personality, moods and emotions experienced by the individual, as well as the way in which he interacts with the other people in his life.

Thus, it is considered relevant to follow the trajectory of the student not only in a perspective of cognitive evolution, but also in their affective and social manifestations. However, it is recognized that monitoring the student's socio-affective path in VLE is not a trivial task, which can be performed efficiently without the use of a technological apparatus.

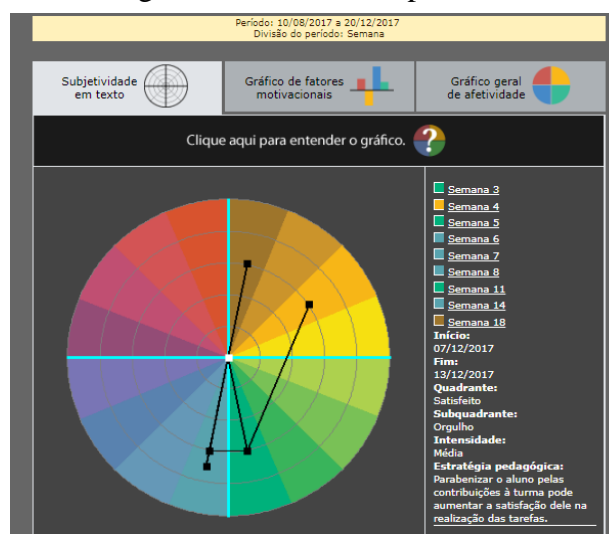
3 AFFECTIVE AND SOCIAL MAPS

It is understood that a VLE should provide resources for the teacher to recognize the student's possible difficulties, both in social relations and in learning. With this look, stands out the ROODA VLE. ROODA aims to provide a space for interaction among its participants. It is user centered, allowing students access to materials and tools, as well as providing spaces for exchanges and sending activities.

Thus, in ROODA, affective and social signs can be recognized through the Affective Map and Social Map tools. Both contribute to the monitoring of the student's socio-affective behavior by informing about their state of mind and presenting indicators of their social interactions. The Affective Map (LONGHI, 2011) aims to point out how much the student is excited, discouraged, satisfied and dissatisfied. This is done by analyzing their insertions in the environment, their navigation pattern and written texts, inferring the state of mind in which they are in a period of time. In this process of inference of the affective condition it is also necessary to evaluate the personality traits, since there is a close interweaving between these and the states of mind. The personality traits signal patterns that characterize how a subject perceives, feels and acts in the most varied situations. To detect the student's personality, the Affective Map makes use of the Big Five questionnaire².

Currently, the inferred results on the student's state of mind are represented in graphs and subsidize the random indication of pedagogical strategies based on affective aspects. The Affective Map interface is illustrated in Figure 1.

Figure 1: Affective Map screen.



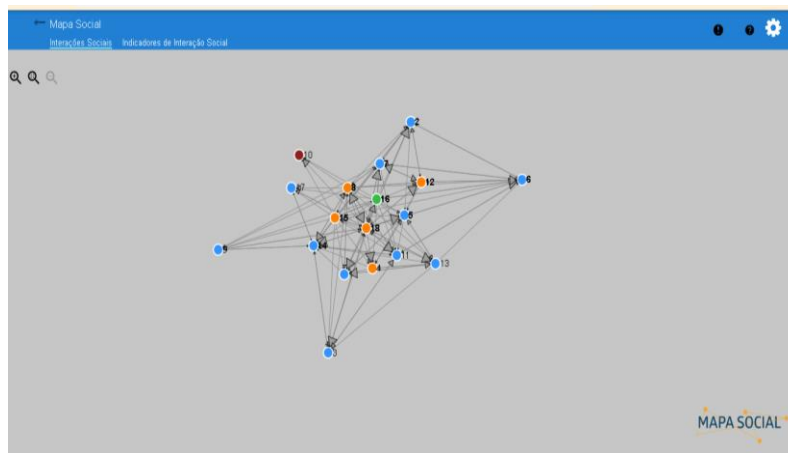
Source: Affective Map (2019).

² The Big Five is a model based on personality traits, whose questionnaire can be answered online and covers five elementary dimensions common to people: Openness, Conscientiousness, Neuroticism, Extroversion, and Socialization.

The Social Map (LONGHI ET AL., 2014) points out the social relationships that are established between the student and the other participants who are interacting through the communication tools of ROODA VLE, such as Library and Webfolio, through the insertion of comments, Chat, Forum, and Contacts. In this sense, the Social Map is a complementary tool that provides the teacher with a mapping of how the interactions between the students are happening. From this verification, the teacher can adapt his pedagogical practice or even have the confirmation that his planning is appropriate.

The interactions are represented in the form of sociograms that visually show the position occupied by the individual in the group and the core of relationships that are formed around them, as shown in Figure 2.

Figure 2: Social Map Screen.



Source: Social Map (2019).

In the Social Map are represented the degree of collaboration of the student, his popularity, distance from the class, his participation in groups formed spontaneously and evasion. This information is defined as indicators of social interaction.

It is understood that, through the information provided by the maps, the teacher can direct his pedagogical actions, personalizing them according to the socio-affective demands of the student.

It should be emphasized that both maps are specific resources of ROODA VLE, and no other virtual learning environments with similar tools were found. Thus, it is impossible to compare different VLE.

4. METHODOLOGY

This work was carried out from a descriptive qualitative approach of the single case study type (YIN, 2015), in which the moods and social interactions of a class of students were mapped and identified, with the objective of evaluating the possible contributions of affective and social aspects for the development of pedagogical practices in the modality of Distance Education.

The case study was applied in an undergraduate course offered in the DE modality, at the Federal University of Rio Grande do Sul (UFRGS), Brazil. This group had 12 students enrolled. The age of these students was between 17 and 40 years. The virtual learning environment adopted was the ROODA together

with its functionalities Affective Map and Social Map, as well as tools for communication (Forum and Logbook) and for the insertion of materials (Library, Webfolio).

All the activities were previously planned in order to prestige the generation of information in the Maps. In the course of the classes, the students were invited to develop tasks in team, which instigated the collaboration in the group generating data in the Social Map. The use of forums was constant, since it was vital for the development of the attributions of each member. In the course of the work, the students posted their personal impressions in the logbook, a tool in which the student records their personal impressions, producing texts that based the tool of analysis of subjectivity in text on the Affective Map. With this, there was a constant supply of information to the affective and social interaction inferences made by the maps. Other tools were used to support the development of activities, such as the Library, for the provision of materials, and the Webfolio, for students to post their productions throughout the course.

5. RESULTS AND DISCUSSION

The monitoring of the mood and social interactions of the students was carried out permanently. Regarding the affective aspect, the Affective Map of each student was consulted weekly. To get a global view and visualize the general behavior of the class, the moods and their corresponding affective families experienced by the students were mapped and are presented in Table 1. The lines describe the affective occurrences of each student³ while the columns contain the affective states.

| STUDENT | EXCITED | | | | DISCOURAGED | | | | SATISFIED | | | | DISSATISFIED | | | |
|---------|----------|------|----------|----------|-------------|-------|------|---------|--------------|-----|------------|-------|--------------|----------|----------|------|
| | Serenity | Hope | Interest | Surprise | Guilt | Shame | Fear | Sadness | Satisfaction | Joy | Enthusiasm | Pride | Irritation | Contempt | Aversion | Envy |
| ST1 | | X | X | X | | | | | X | | | X | | | | |
| ST2 | | | X | | | | | X | X | X | | | | | | |
| ST3 | X | | X | X | | | | | X | | | | | | | |
| ST4 | | | X | | | | | | X | X | | | | | | |
| ST5 | | X | X | X | | | X | X | X | X | | X | | | | |
| ST6 | | | | | | | X | X | X | | X | | | | | |
| ST7 | | | | | | | | | X | | | | | | | |
| ST8 | evaded | | | | | | | | | | | | | | | |

³ In order to preserve the identity of the students they are identified by numbers 1 to 12.

| | | | | | | | | | | | | | | | | |
|-------------|--|--|---|---|---|---|---|---|---|---|---|---|--|---|--|--|
| ST9 | | | X | X | | | | | X | X | | X | | | | |
| ST10 | | | | X | | | X | X | X | | | | | | | |
| ST11 | | | X | | | X | X | X | X | | X | | | X | | |
| ST12 | | | X | | X | | | | | | | | | | | |

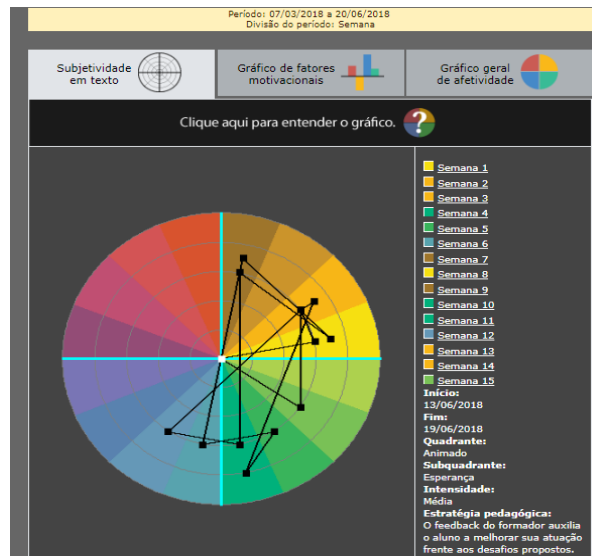
Table 1: Mapping of the affective states of the students by subjectivity in text.

Source: the authors (2019).

We can see in Table 1, the fluctuation in the affectivity of the students, because there were: 21 records in which the students said *Satisfied* with the course of the discipline; 16 records pointed to the *Excited* state; and 9 records in which it was manifested were *Discouraged*. Only one student was shown to have been *Dissatisfied*, a situation in which his manifestations in the environment were inferred as contempt. AM also demonstrated that positive emotions expressing satisfaction, interest, surprise, joy, pride, serenity, and enthusiasm were what prevailed in the class. Likewise, in the negative spectrum, it was identified in the AM that some students expressed emotions involving sadness and fear. The variations, for the most part, occurred within the positive valence, which may indicate that the pedagogical and didactic choices adopted by the teacher were adequate for this class. In this case, the teacher, through the communication tools of ROODA and the proposed activities, sought to instigate the student to continue to deepen their knowledge, in order to remain excited and / or satisfied in this trajectory. Piaget (2014) emphasizes that affectivity intervenes in the functioning of intelligence and structures of knowledge, without generating or modifying them. Interference occurs through the acceleration or delay of intellectual development, and may have great significance in this process.

Figure 3 illustrates the Wheel of Affective States (WAS), which demonstrates the states of mind of a student. In the case of student ST5, for example, his state of mind ranged from Excited and Satisfied to Discourage. The WAS is composed of four quadrants: satisfied (quadrant I - yellow color), dissatisfied (quadrant II - red color), discouraged (quadrant III - blue color) and excited (quadrant IV - green color). In it are also pointed out the families of emotions contained in the state of mind and the intensity (high, medium, low) with which certain emotion is manifesting in the individual.

Figure 3: ST5 Student Wheel of Affective State



Source: Affective Map (2019).

Through WAS it is possible to follow the oscillation of the affective behavior of the student every week of class. In this specific case, the behavior suffered constant variations during the semester, passing from Satisfied mood (1st quadrant - clockwise), in which he experienced emotions involving pride, joy and satisfaction, to the Excited mood (2nd quadrant) contemplating surprise, interest and hope. It should be noted, however, that in two non-consecutive weeks he experienced emotions linked to sadness being therefore, Discouraged (3rd quadrant). This variation occurred in the 6th and 12th weeks and involved emotions related to sadness and fear. In both situations, the teacher intervened in order to help the student in overcoming the difficulties experienced. It is believed, based on the data, that such measures were successful because, after being taken, it can be observed in the WAS that the student's state of mind returned to be positive.

From the use of VLE it is possible to perceive the individual experiences of the subjects and the way each user navigates and uses the available tools. These data can help teachers to detect the affective state of the subjects involved in the action. In fact, the possibilities offered by the platforms have made the students more active, but for a variety of reasons, this action is often not visible to the teacher, who is unaware of the difficulties and frustrations of the students. It is understood that the realization of this type of mapping has much to contribute with the pedagogical work of the teacher, since it presents particularities that often are not easily visible. With the presence of a large number of students in a VLE, the individual follow-up of the students becomes difficult, considering the different attributions that a teacher possesses.

In a similar procedure to that adopted for the AM, the mapping of the interactions carried out by the students during the semester through the Social Map was carried out. The relationships observed in the case study are presented in Table 2, whose columns show the indicators: collaboration (column 2), detachment from the class (column 3), evasion (column 4), informal groups (column 5), and popularity (column 6). In the lines are pointed out the relation of the student with the indicator: if the student appeared in the Social Map of the indicator in focus, then his column is marked with an 'X'.

Table 2: Mapping of social interaction indicators.

| Indicadores de Interação Social | | | | | |
|--|-----------------------------------|---|------------------------|------------------------------------|--------------------------------|
| (1) STUDEN T | (2) Collabora tion | (3) Detachme nt from the class | (4) Evasion | (5) Informal Groups | (6) Popularit y |
| ST1 | X | | | | |
| ST2 | | | | | |
| ST3 | | | | | |
| ST4 | | | | | |
| ST5 | | | | | |
| ST6 | | | | | |
| ST7 | | | | | |
| ST8 | | | X | | |
| ST9 | X | | | | X |
| ST10 | X | | | | |
| ST11 | X | | | | X |
| ST12 | | | | | |

Source: the authors (2018).

Examining the presented data, it is verified that only four students stood out in collaboration (column 2). The Collaboration indicator indicates how much the subject contributed to the class interactions and also by posting materials. It is understood that collaboration occurs through the exchange of ideas, verbal communication, suggestion of materials, pages etc. For Piaget (1973, p. 81), "[...] collaborating boils down to the meeting of actions that are carried out in isolation by the partners, even when they do so towards a goal". It should be noted that due to the difficulty in analyzing the content of the messages exchanged for the effective observation of the collaboration, the tool demonstrates a number of occurrences of exchanges that is above the average of the rest of the class, thus inferring effort and interest of the student in interacting and contributing with colleagues. Of course, it is up to the teacher to determine whether or not this factor is relevant in his teaching approach, and it is necessary to follow the performance of the students in this indicator and ensure the promotion of spaces that allow students to make the changes.

Regarding the item detachment from the class (column 3), no students were systematically ignored by colleagues in their communications. It is important to follow this type of occurrence, as the consequences can lead to avoidance. Regarding the evasion indicator (column 4), it was verified that ST8 dropped out of the discipline, since it never accessed VLE. Regarding the informal groups indicator (column 5), it was verified that there was no spontaneous grouping among VLE participants. When this occurs, the teacher can use this aspect in the creation of pedagogical practices that motivate students in learning. In the popularity indicator (column 6) the students ST9 and ST11 stood out. Faced with this, the teacher sought to engage them with other colleagues in order to keep everyone committed to the studies.

It is believed that through the support provided by the SM, the teacher can direct his pedagogical practices to those students who require more help, expanding the forms of communication in the class and opportunities for learning through collaboration. This type of pedagogical practice can contribute to the reduction of cases of evasion, which is one of the main difficulties of the DE.

In this general way, it is observed that the socio-affective information provided by the maps subsidizes pedagogical interventions according to the needs of the students, enabling: a) to solve difficulties experienced by the students in the context of the development of the activities or in the relationship with the colleagues; b) keep the participants interested and involved with the classes during their learning.

6 FINAL CONSIDERATIONS

The focus of the article was to present an analysis of the possible contributions of affective and social aspects to the development of pedagogical practices in Distance Education.

The affective and social status of the student along a class or course can both favor or hinder their learning process, which is believed to be an interdisciplinary and relevant aspect. Considering Piagetian theory, well-structured intellectual development presupposes due attention to affectivity and social interactions. Therefore, attention to these aspects becomes critical in the process of knowledge building.

Based on these issues, it is necessary to take a close look at these affective and social aspects, making it possible to identify gaps that interfere with the process of building students' knowledge. In this sense, this article demonstrated that the aid provided by the Affective Map and Social Map tools allows the teacher to identify and monitor the student's socio-affective situation. It was verified that such information was of great importance for the educator to reflect on their pedagogical practices, reorienting them with the adoption of actions and / or strategies more appropriate to the needs and interests of each student, which contributed to maintain the dedication of students to studies.

It is understood that the results point to the relevance of the support that the information available can provide to the teacher. However, such aid will be refined, since the interpretation of the results can promote subsidies so that different types of actions are carried out, according to the preferences of each teacher in the environment. To do so, based on the data extracted from the maps, a recommendation system is being developed that will provide the teacher with suggestions of social and affective strategies according to the demands of each student. The objective is to promote, to the different teachers that use ROODA, ways of using the data extracted from the tools, in order to promote a reflection and the improvement of the pedagogical practices carried out in VLE.

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