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Socio-affectivity in Distance Education

By

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Abstract

This article aims to analyze socio-affectivity in Distance Education (DE). In DE, affection and social exchanges may not occur spontaneously. In this modality, the space for interaction between students is usually restricted to the chosen platform. In this context, the ways of interacting are modified, influencing the relationships and intellectual exchanges that will occur between the subjects. Thus, given the importance of affection and social interaction, considering the influence of these two aspects in the daily classroom routine is relevant in any school context. However, in DE, these elements are often neglected. The methodology adopted was the Systematic Literature Review (SLR) that used seven databases from 2015 to 2023. In an initial search, no work was found that addressed socio-affectivity in DE, so it was necessary to conduct two SLRs, one for social interactions and another for moods. Therefore, 5,215 articles were found, of which only 21 met the exclusion and inclusion criteria. From this, it was possible to identify a lack of research addressing the topic. The conceptualization of social interactions in the literature is still unclear, and initiatives focused on this area have a vast field of research. Regarding affection, the topic has been growing in the last three years, but publications addressing animation, discouragement, satisfaction, and dissatisfaction have an area of research to be explored.

Index Terms- *Distance Education, moods, social interactions, Systematic Literature Review.*

1. INTRODUCTION

In Distance Education (DE), a more active approach is required from the actors, whether in their individual or collective construction. If the needs of the subjects are not met and conditions and incentives are not found to develop collaboration, engagement, interaction, among others, it will be difficult for the student to take control and manage their learning (Godoi, 2016). According to De Almeida and Pillonetto (2019), autonomy, discipline and organization are fundamental qualities for the success of the DE student.

In this scenario, dialogical mediation creates spaces for meaningful exchanges to occur and affection to manifest, both of which are essential for learning to occur. Thus, when considering the singularities of DE, we assume the importance of monitoring social and affective interactions in Virtual Learning Environments (VLE).

In this sense, the research by Silva, Silva and Campos (2018) points to the need to view affective relationships as an instrument that intensifies the teacher-student or student-student relationship and helps minimize problems, such as drop out. For the authors, affection establishes a bond of trust between the parties, which can keep students studying. This work encourages some reflections, such as the importance of social and affective aspects in VLE, the need for greater contact between subjects and closer relationships between them. In addition, Lopéz, Redondo and Vilas (2021) point out that activities carried out on DE platforms allow researchers to identify different behaviors or student profiles.

The research by Peng and Dutta (2023) asserts that personal innovation and system usability are highly correlated with the willingness to adopt e-learning. Furthermore, it indicates that personality such as openness to experience, agreeableness, extroversion, and neuroticism significantly mediate the adoption of DE. The findings of this publication can help in the field of Education, especially designers of VLE platforms, to consider individual differences of students in their design, as well as personality, in order to increase the ability of students to adapt to these systems, especially in the post-pandemic era. Therefore, the guiding question of this research was to analyze socio-affectivity in DE. Regarding the relevance of this research, the identification and discussion of a gap between social and affective aspects stands out. Thus, this article is divided into four sections. The first presents the

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introduction, contextualizing the subject, as well as its objectives. The second describes the research methodology, as well as its development stages. In the penultimate section, the results collected are analyzed and discussed. Finally, the conclusions are listed.

2. METHODOLOGY

In this stage, the theoretical framework was constructed based on studies related to social and affective aspects. In this sense, two Systematic Literature Reviews (SLR) were carried out in order to identify the characteristics that are considered, how they are inferred and the compression of the themes addressed in DE.

SLR identifies, evaluates and interprets all available research relevant to a specific issue, topic of the area or phenomenon of interest, applying a reliable, rigorous and auditable methodology. The reason for carrying out a review is to identify gaps in current themes, suggest areas for future investigations and provide a structure to adequately position new research activities (Kitchenham, 2007).
SLR is conducted following the four steps suggested by Kitchenham (2007).

In this context, the definition of each step is explained below:

1. **Research identification:** in this stage, the search databases were selected. The choice was made taking into account its relevance and the vast amount of titles available, both in relation to social and affective aspects. The seven online research sources used were:

- Association for Computing Machinery (ACM: http://portal.acm.org);
- Institute of Electrical and Electronics Engineers (IEEE: https://ieeexplore.ieee.org/Xplore/home.jsp);
- ISI Web of Science (ISI: http://www.isiknowledge.com);
- Journal of Informatics in Education: Theory and Practice (RIETP: http://seer.ufrgs.br/InfEducTeoriaPratica);
- Journal of New Technologies in Education (RENOTE: https://seer.ufrgs.br/renote)
- Science Direct (SD: https://www.sciencedirect.com);
- Scopus (https://www.scopus.com/home.uri).

2. **Selection of studies:** in this step, generic strings were defined. The keywords were applied in the search databases (all terms were validated by two experts in the areas). In this scenario, an investigation was carried out in international databases (ACM, IEEE, ISI, SD and Scopus) using the following descriptor: ((“social interactions”) AND (“distance education” OR “e-learning”)). On the other hand, in the national repositories (RENOTE and RIETP), the string ((“social interactions”) AND (“distance education” OR “e-learning”) was applied. It is worth noting that these two databases did not return any work with the descriptors previously applied. Thus, it was changed to “social interactions” and used in searches in Portuguese, to expand the possibilities in order to obtain results, even if less specific.

In addition, a query was carried out in the international databases (ACM, IEEE, ISI, SD and Scopus) using the following descriptor: ((“moods” OR “personality”) AND (“distance education” OR “e-learning”)). On the other hand, in the national repositories (RENOTE and RIETP), the string ((“moods OR “personality”) AND (“distance education” OR “e-learning”)) was applied. It is worth noting that the RENOTE and RIETP databases did not return any publications with the descriptors previously applied. Therefore, it was changed to “moods” OR “personality” and applied in the searches in Portuguese, so that the possibilities could be expanded in order to obtain results, even if less specific.

In this way, the search in these databases provided support for creating the exclusion [E] and inclusion [I] criteria. For this theoretical construction, five parameters were generated to eliminate and two to add research.

The first exclusion criterion [E1] includes more recent studies on the areas (2015 to 2023), providing a current and contextualized discussion on the application of the project. The second [E2] indicates the impossibility of free access to the full original text. The third [E3] concerns articles presented in more than one database. The fourth [E4] defines that the research should mention relationships with the theme. Finally, for the analysis of the last criterion [E5], the abstract was read and a diagonal reading was performed, considering the introduction, the main topics and the final considerations, seeking to identify whether they are related to the theme. For the inclusion criteria, [I1] indicates articles that were peer-reviewed to ensure the quality of the work and [I2] refers to studies in Spanish, English and Portuguese, so that reading would be possible without the need for translation resources.

3. **Data extraction and monitoring:** at this stage, the Research Questions (RQ) that were sought to be answered by analyzing all the works were defined. Thus, a total of six RQs were developed, three of which were about social interactions and three about affective aspects:
    1. What particularities are analyzed in research on social interactions in Distance Education?
    2. How are social interactions inferred in Distance Education?
    3. What do the authors understand by social interactions in Distance Education?
    4. What characteristics are considered in studies on affective aspects in Distance Education?
    5. How are personality or mood inferred in Distance Education?
    6. What do the authors understand by affective aspects in Distance Education?

Therefore, the Research Questions enabled the development of the next stage.

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4. Synthesis of information: in this step, the data obtained from the RQs were summarized. The Parsif.al tool (http://parsif.al) was used to support the construction of this theoretical basis, which allowed the process of inclusion and exclusion of articles to be monitored and recorded.

The following section presents the analysis and discussion of the works selected in the SLR.

3. DISCUSSION AND ANALYSIS OF RESULTS

This subsection describes studies that are directly related, in some way, to the theme of social interactions and affection in the context of DE. Therefore, it was necessary to conduct two separate SLRs, since no study was found that addressed socio-affectivity together. Therefore, one SLR was conducted for affective aspects in DE and another for social interactions in DE, as explained below.

3.1 Studies on Social Interactions in Distance Education

The SLR began with searches in the databases. Thus, based on the initial total of publications found, each exclusion criterion was applied sequentially, as shown in Table 1.

Table 1: Exclusion criteria applied in the databases.

Database	Exclusion criteria				
	E1	**E2**	**E3**	**E4**	**E5**
ACM	460	287	96	10	4
IEEE	297	271	2	1	1
ISI	46	27	5	0	0
RENOTE	4	4	4	3	2
RIETP	1	1	1	1	0
SD	658	403	141	4	2
Scopus	1.033	437	26	1	1
Total	**2.499**	**1.430**	**274**	**19**	**10**

Source: prepared by the author (2025).

In this way, the 10 works found are indicated, as well as their respective abstracts and results. To facilitate visualization, codes are used in the searches, that is, a letter and a number for each article, for example, A1. The detailed description of the work can be found in the references section.

[A1] The investigation presented a conceptual framework for a study that aimed to measure students' social interaction and knowledge construction in an asynchronous online forum. The results were a theoretical framework with an emphasis on the advantages of each application technique, namely Content Analysis, Cluster Analysis and Social Network Analysis, based on messages posted in the forum.

[A2] The research proposed classifying students taking into account the possible ways of interacting with the gamified online learning environment and its educational resources. The results considered the creation and recommendation of three "missions" focused on: (1) the most common interactions of students, (2) the least common interactions of students and (3) more than one type of interaction at the same time.

[A3] The study examined a system for visualizing and analyzing online interactions of people and resources, integrated into Moodle. As a result, students receive an educational diagnosis with opportunities and teachers receive a report containing weaknesses in their teaching environment.

[A4] The objective was to analyze the formation of networks through social relationships and interactions between members in a DE course in the VLE ROODA. The results indicate that carrying out collaborative activities from the beginning of a course is of fundamental importance to obtain better interaction between students and, as a consequence, a more participatory class.

[A5] The research explored the impact of students' online learning activities and verified whether their interactions were of a cognitive nature. The results show that students go through different tasks as imposed by the modules. In addition, suggestions were provided to help students interact more with the course materials.

[A6] The article presented the planning, implementation and evaluation of the Learning Objective of Pedagogical Strategies based on social interactions in VLE. The results demonstrated the importance of materials that enable teachers to approach and pay attention to students in VLEs, as well as the implementation of activities that allow teachers to reflect on the challenges faced by students.

[A7] The research designed and built a learning-oriented social network, adapted to the needs of students to help them integrate into study groups, ensuring better performance and facilitating the grouping of tasks for the teacher. As a result, the system generates recommendations that improve the learning process, providing students with desirable collaborators and relevant resources that better adapt to their needs.

[A8] The study aimed to analyze the predictive relationships between teaching presence, cognitive presence, social presence, student presence, and satisfaction with the online course. The results demonstrated a statistically significant predictive relationship between student presence and the other three (cognitive, social, and teaching). Satisfaction with the online course was predicted by social and teaching presence. Thus, based on the findings, it is recommended that institutions that offer online courses should develop concrete strategies that promote social and teaching presence, as these variables are precursors of satisfaction with the online course. Finally, the design of online courses must be effective and student-centered to attract them, since their presence determines the other three in the online learning environment.

[A9] The objective was to develop an approach that predicted student engagement and success in e-learning courses. The

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results reveal that there is a non-linear correlation between learning success and student engagement.

[A10] This study examined students' experiences of interacting with content and the factors that affect the level of interaction, appreciation, and participation in DE. The article used a social e-learning environment that worked integrated with the content and offered students options for synchronous and asynchronous interaction with their peers and teachers. As a result, students guided to asynchronous activities demonstrated a study-oriented approach to the content and engaged in interactions for a shorter period of time and in fewer numbers than their peers. The factor that most affected participation and appreciation was the structural and technical characteristics of the system.

Of the total of 10 studies, eight were international and two were Brazilian. In this scenario, it was observed that most of the investigations are international and that, despite the importance of reflecting on social interactions in DE, there are few articles in the literature related to the topic, with only 10 being found. Thus, it was analyzed that the publications differ in the particularities they explore.

The study by Durairaj and Umar (2015) aimed to obtain information about student engagement and knowledge construction in an online Forum.
The research by Paiva *et al.* (2015) identified four pedagogical scenarios based on the different ways in which students interacted with the learning environment, which could be collaborative, gamification, pedagogical and social. Collaborative scenarios were defined as those students interested in helping other students. Gamification students were focused on achieving the game elements available, such as points, badges, ranking, among others. Pedagogical scenarios focused on expanding and testing their knowledge, watching videos, answering exercises, tests, etc. Finally, social scenarios were interested in participating in activities such as chatting and sharing their progress on social networks.

The authors Ferreira, Ribeiro and Behar (2017) intended to use the Forum and the Contacts tools for social exchanges, in addition to the Social Map tool to observe the formation of networks in a class.

The work of Rei, Figueira and Oliveira (2017) presented a functionality that helps the teacher to classify and illustrate the degree of participation, as well as to find the implicit relationships between individuals and resources or events.

The article by Panchoo (2018) investigated collaboration based on social exchanges between tutors and students in a Chat.

The publication by Aouidi, Lamia and Hafidi (2019) analyzed the social interactions that occur in a Social Network oriented towards learning between user-users and user-resources, based on the students' registration history to deduce their preferences, needs and interests.

Subsequently, Ribeiro and Behar (2019) explored the interactions in the Chat, Diary, Forum and Webfolio in the VLE ROODA, enabling subjects to participate more actively in their learning process through the use of a Learning Object.

Armah, Bervell and Bonsu (2023) verified the presence of teachers, cognitive, social and students, and satisfaction with the online course. Data were collected through a questionnaire.

The study by Benabbes *et al*. (2023) analyzed engagement in learning, considering the total number of posts made on the Forum and the time spent on the e-learning platform.

The research by Karsli and Karaman (2023) examined students' experiences of interaction with the content and the factors that affect the level of interaction, appreciation and participation in DE. Therefore, it is possible to verify that the analysis of social interactions in DE can be done through indicators, including collaboration (Paiva *et al*., 2015; Panchoo, 2018) and groups (Ferreira; Ribeiro; Behar, 2017).

Social interactions are inferred in different ways. The authors of Durairaj and Umar (2015) proposed the combination of three analyses, namely: Content, Cluster and Social Network.

The work of Paiva *et al.* (2015) applied algorithms that use Recommendation System techniques based on content filtering to offer “missions” to students.

The investigation by Ferreira, Ribeiro and Behar (2017) inferred interactions through the Social Map tools inserted in the VLE ROODA.

The publication by Rei, Figueira and Oliveira (2017) adopted Social Network Analysis techniques in Moodle.

Subsequently, Panchoo (2018) used Content Analysis based on the Activity Theory of Jaillet and Panchoo (2005).

The study by Aouidi, Lamia and Hafidi (2019) employed Data Mining techniques and Intelligent Recommendation Systems.

Ribeiro and Behar (2019) analyzed social interactions in a Learning Object called SocioAVA_EP.

The research by Armah, Bervell and Bonsu (2023) examined the questionnaire responses by applying Partial Least Squares Structural Equation Modeling.

The authors Benabbes *et al.* (2023) used an unsupervised clustering technique, based on the dataset, to group students according to their level of engagement. In addition, several supervised classification algorithms were trained and their performances were evaluated by applying cross-validation techniques and accuracy metrics. In this work, the decision tree rule model was the most relevant, with an accuracy of 98% and an AUC score of 0.97.

The article by Karsli and Karaman (2023) investigated student interaction with content in an e-learning environment and applied semi-structured interviews with students. The data obtained were examined using Descriptive Analysis and Content Analysis. In this regard, it was noted that the focus on monitoring students' social interactions is still a recent practice, given that, on some platforms, this data is still insufficient. Thus, it was necessary to use other tools and have

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quantitative and qualitative techniques so that information about students' interactions could be analyzed. In three publications (Durairaj and Umar, 2015; Ferreira, Ribeiro and Behar, 2017; Rei, Figueira and Oliveira, 2017), the use of Social Network Analysis was found to better understand the dynamics established in the functionalities and environments in question.

The understanding of social interactions in DE is carried out in different ways.

The research by Durairaj and Umar (2015) interpreted based on the theories of social constructivism by Lev Vygotsky, online learning by Terry Anderson and connectivism by George Siemens. The author Panchoo (2018) considered social interactions as stimuli or transfers for users who cooperate with each other around the computer, based on studies by Marcel Lebrun. The work of Ferreira, Ribeiro and Behar (2017), and Ribeiro and Behar (2019) understands, through the Piagetian perspective, that the construction of the individual's knowledge occurs during their interaction with the object and with other subjects. The investigations by Paiva *et al.* (2015); Rei, Figueira and Oliveira (2017); Aouidi, Lamia and Hafidi (2019); Armah, Bervell and Bonsu (2023); Benabbes *et al.* (2023); Karsli and Karaman (2023) did not present conceptualizations of what they understand as social interaction.

Therefore, it was possible to observe that technological tools are extremely important for monitoring interaction in DE. However, it is clear that their conceptualization in the literature is still unclear, and there is a lack of research.

Thus, it was identified that initiatives focused on this theme have a vast field of research. It is important to highlight that a constant analysis of student interactions in the functionalities of the VLE allows the teacher to adjust the adopted trajectory, if necessary, in order to incorporate strategies that prioritize the aspects to be improved.

Thus, studies on affective aspects in DE are presented below.

3.2 Studies on Affective Aspects in Distance Education

This subsection describes studies related to the theme of affective aspects in the context of DE. Therefore, based on the initial total of studies found, each exclusion criterion was applied sequentially, as shown in Table 2.

Table 2: Exclusion criteria applied to the databases.

Database	Exclusion criteria				
	E1	**E2**	**E3**	**E4**	**E5**
ACM	466	466	293	9	3
IEEE	85	73	42	0	0
ISI	182	99	16	2	0
RENOTE	2	2	2	1	1
RIETP	2	2	2	1	0
SD	1.447	515	229	13	1
Scopus	532	186	22	11	6
Total	**2.716**	**1.343**	**606**	**37**	**11**

Source: prepared by the author (2025).

Thus, the 11 investigations found are highlighted, as well as their respective summaries and results.

[B1] The article presented the construction of a prototype of an Emotionally Adaptive Platform, which is used to perceive the emotional state, personality and learning preferences of the student and adjust the course based on these points. As a result, the data collected from the tests carried out showed that there is a statistical difference between the learning of students, analyzing two platforms, one that takes into account the emotional state and the other that does not. There is an indication that, by introducing the component to the platform, the learning of students can be improved.

[B2] The investigation explored to what extent students' personalities impact their learning and behavior in a massive open online course. The results indicate that conscientiousness is positively correlated with three characteristics of the Forum: the number of responses, posts and interactions. Students with a high degree of extroversion spend less time on the Forum than compared to those with a low level. Furthermore, it was found that correlation coefficients tend to increase as the weeks of the course progress, as more data on activities about each student are collected, and extroversion and neuroticism achieve greater prediction accuracy at the end of the course.

[B3] The study examined how academic performance and the cognitive, emotional and social aspects of perceived learning are affected by the level of average naturalness (face-to-face learning versus synchronous e-learning via videoconferencing) and by the personality (neuroticism, emotional stability, extroversion and introversion) of the students. As findings, it was found that videoconferencing present in average naturalness intensified the cognitive aspect of perceived learning, but compromised the emotional and social ones. Regarding personality, neurotic students tend to enjoy and be more successful in face-to-face learning, while those with emotional stability are successful in both learning conditions (face-to-face and e-learning). Extroverts prefer face-to-face environments, despite performing worse in these conditions. Finally, introverts performed better in face-to-face learning.

[B4] The objective was to identify the personality dimensions of students based on the Big Five and use educational data resources to develop an automatic classifier that predicts personality based on their traits. The results revealed that most of the five dimensions: openness to experience, agreeableness, extroversion and neuroticism, can indeed be predicted using educational resources. Conscientiousness cannot, requiring the collection of more data and the selection of other means.

[B5] The research established links between personality, learning styles and academic performance of students enrolled

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in e-learning courses. The personality considered were openness to experience, agreeableness, conscientiousness, extroversion and neuroticism. Learning styles were divided into: active, global, intuitive, reflective, sequential, sensing, verbal and visual. Finally, academic performance was classified as: high achievement, motivated learning and effective learning. The results indicate that extroversion was positively related to all learning styles, while neuroticism was negatively related. It was also revealed that academic performance was positively correlated with openness to experience, agreeableness and conscientiousness, and negatively correlated with neuroticism. Likewise, academic performance was positively correlated with the active, global and intuitive learning styles. It was negatively correlated with reflective, sequential and sensitive. However, no relationship was found between the verbal and visual styles.

[B6] The article applied Educational Data Mining to identify patterns of behavior related to motivational factors (Confidence, Effort and Independence) and mood (Animated, Discouraged, Satisfied and Dissatisfied) in student interactions in a VLE. As a result, it was found that the student's (de)motivation is directly related to their mood, and can undergo both positive and negative changes depending on the degree expressed in the motivational factors of Confidence, Effort and Independence.

[B7] The research analyzed the Big Five personality, self-reported cognitive abilities (developmental, neurocognitive, and heritability evidence), and learning motivation factors (clear direction, efficacy, challenging goals, punishment, social pressure and competition, reward, and recognition) of computer programming majors compared to other e-learning students. As a finding, computer programming majors demonstrated significantly lower scores on extroversion, clear direction, challenging goals, punishment, reward, and recognition motivation factors.

[B8] The study presented a gamification concept applied to e-learning with a focus on improving the engagement of different personality types of undergraduate students in ERP courses. As a result, selecting a game element based on personality does not necessarily improve knowledge, but allows for greater involvement in the course.

[B9] The objective was to examine the relationship between personality and student autonomy in DE. The results indicate that male students have more autonomy in e-learning, while female students have higher scores on personality, with the exception of agreeableness. Student autonomy had positive correlations with the four personality, except for neuroticism.

[B10] The present research investigated the impact of personality on the assessment of perceived usability of e-learning platforms. As findings, openness to experience and extroversion demonstrated correlation with the assessment of perceived usability.

[B11] The paper developed an experimental model to determine the factors that influence students' adoption of e-learning in the post-pandemic era. The results showed that all personality, except conscientiousness, induce the adoption of DE. The most important factor was extroversion, and the one that had the least impact was agreeableness. Additionally, it was found that personal innovativeness and usability are highly correlated with the willingness to adopt e-learning.

The results of the research provide an overview of the investigations that are being carried out in relation to the affective aspects in DE. Therefore, it was found that the studies apply different techniques to analyze personality and moods.

In the work of Chen *et al*. (2016), regression was used using Spearman's correlation coefficient to measure the effectiveness of each of the personality.

Subsequently, Faria *et al.* (2016) adopted descriptive statistics to compare the results of the groups that used the emotional adaptive platform with those that did not use it.

The authors Blau, Weiser and Eshet-Alkalai (2017) applied the mean and standard deviation to the variables: personality, average naturalness and perceived learning.

Abyaa, Idrissi, and Bennani (2018) identified seven different supervised learning classification algorithms, namely: Support Vector Machines, k-Nearest Neighbors, Naïve Bayes, Random Forest, J48, Logistic Regression, and Bagging, using personality scores for each dimension (high or low) as values.

The research by Siddiquei and Khalid (2018) explored Pearson's correlation coefficient to assess the relationship between personality, learning styles, and academic performance of students enrolled in e-learning courses.

The research by Barvinski *et al*. (2019) applied Educational Data Mining to examine behavioral patterns related to motivational factors and the mood of students in a VLE.

The publication by Dirzyte *et al*. (2021) used Cronbach's Alpha on the data collected from the three instruments used (Learning Motivating Factors, Self-Report Measure of Cognitive Abilities and Big Five).

The article by Pakinee and Puritat (2021) analyzed the data quantitatively, conducting a pre-test and a post-test after using the gamified environment to verify student engagement.

The study by Fırat (2022) adopted descriptive statistics using the t-test, Mann-Whitney U test, Pearson's correlation coefficient and linear regression.

The work by Vlachogianni and Tselios (2022) investigated the data obtained from the three questionnaires (Big Five, System Usability Scale and demographic) with Cronbach's Alpha.

Peng and Dutta (2023) applied the Delphi method to conceptualize the research structure and Structural Equation Modeling (SEM) to explore personality. The methods applied in each research found are addressed in Chart 1.

Chart 1 - Methods applied to affective aspects in Distance Education.

Study	Method

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Chen *et al.* (2016); Faria *et al*. (2016); Blau, Weiser and Eshet-Alkalai (2017); Siddiquei and Khalid (2018); Dirzyte *et al*. (2021), Firat (2022), Vlachogianni and Tselios (2022); Peng and Dutta (2023).	Statistic.
Abyaa, Idrissi and Bennani (2018), and Barvinski *et al.* (2019).	Educational Data Mining.
Pakinee and Puritat (2021).	Questionnaire.

Source: prepared by the author (2025).

Therefore, it is possible to verify, based on Chart 1, that eight publications apply statistics to analyze the affective aspects in DE.

The affective aspects are inferred in different ways. The articles by Chen *et al.* (2016); Abyaa, Idrissi and Bennani (2018); Siddiquei and Khalid (2018); Pakinee and Puritat (2021); Peng and Dutta (2023) requested the completion of the Big Five model.

The study by Faria *et al*. (2016) examined two questionnaires, the Big Five (Costa and Mccrae, 1992; Goldberg, 1990) and the VARK covering four dimensions: visual, aural, reading/writing and kinetic, to determine learning preferences (Fleming and Baume, 2006).

The work of Blau, Weiser and Eshet-Alkalai (2017) applied two questionnaires: the NEO-PIR by Blau and Barak (2012) to measure personality and the self-report to measure perceived learning that assesses three subscales: cognitive, emotional and social aspects (Caspi and Blau, 2008, 2011).

In their study, Barvinski *et al.* (2019) used the IFP (Pasquali, Azevedo and Ghesti, 1997), which is a psychological test based on personality and motivational factors that are Confidence, Effort and Independence (Bercht, 2001).

The authors Dirzyte *et al*. (2021) used the Big Five by Costa and Mccrae (1995), the Self-Report Measure of Cognitive Abilities instrument by Jacobs *et al*. (2014) and Learning Motivating Factors by Law, Lee and Yu (2010).

Fırat (2022) analyzed two scales, the Big Five by Rammstedt and John (2007) and the e-Learning Autonomy Scale (e-LAS) by Firat (2016).

The investigation by Vlachogianni and Tselios (2022) adopted the System Usability Scale by Brooke (1996), Big Five by Goldberg (1992) and a demographic questionnaire by Bangor *et al.* (2009).

In this context, it was observed that affective aspects are inferred mainly through the Big Five questionnaire, in which nine studies apply the test developed by Costa and McCrae (1992, 1995, 1999); De Raad (2000); Goldberg (1990, 1992, 1993); Rammstedt and John (2007).

Thus, by analyzing the publications, it was possible to verify that all the others require the student to fill out at least one questionnaire in order to detect their personality or mood. As limitations of these articles, it is worth pointing out that students who do not want to answer the test are eliminated from the sample, since there is no way to examine their affective aspects.

The understanding of affective aspects in DE is understood in different ways. The studies by Chen *et al.* (2016); Faria *et al*. (2016); Abyaa, Idrissi, and Bennani (2018); Siddiquei and Khalid (2018); Dirzyte *et al*. (2021); Pakinee and Puritat (2021); Firat (2022); Vlachogianni and Tselios (2022); Peng and Dutta (2023) apply the Big Five model covering five dimensions: openness to experience, agreeableness, conscientiousness, extroversion, and neuroticism. The Big Five is addressed by several authors in their works, including: Costa and Mccrae (1992, 1995, 1999); De Raad (2000); Deyoung *et al*. (2016); Goldberg (1990, 1992, 1993); Rammstedt and John (2007).

The research by Blau, Weiser and Eshet-Alkalai (2017) examined how academic performance and perceived cognitive, emotional and social aspects of learning are affected by the level of average naturalness (face-to-face learning versus synchronous e-learning via videoconferencing) and personality (neuroticism, emotional stability, extroversion and introversion) of students.

The research by Barvinski *et al.* (2019) analyzed mood such as Satisfied, Animated, Discouraged and Dissatisfied (Longhi, 2011) and motivational factors such as Confidence, Effort and Independence (Bercht, 2001). The summaries of how the authors of the articles define the affective aspect can be seen in Chart 2.

Chart 2 - Understanding of the affective aspect by the authors.

Study	Affective Aspect
Chen *et al*. (2016); Faria *et al*. (2016); Abyaa, Idrissi and Bennani (2018); Siddiquei and Khalid (2018); Dirzyte *et al*. (2021); Pakinee and Puritat (2021); Firat (2022); Vlachogianni and Tselios (2022); Peng and Dutta (2023).	Personality conceptualized as: openness to experience, agreeableness, conscientiousness, extroversion and neuroticism.
Blau, Weiser and Eshet-Alkalai (2017).	Personality: neuroticism, emotional stability, extroversion and introversion.
Barvinski *et al.* (2019).	Mood: Satisfied, Animated, Discouraged and Dissatisfied.

Source: prepared by the author (2024).

Thus, based on Chart 2, it is possible to see that 10 publications consider personality as an affective aspect, while only one study investigates moods. Given this, there is an

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indication that, although the topic has been growing in the last three years in terms of the number of studies, totaling five, the investigations that analyze animation, discouragement, satisfaction and dissatisfaction have a vast field of research to be explored. It is worth noting that constant monitoring of students' affectivity in the functionalities of the VLE in DE allows the teacher to personalize teaching by meeting the individual needs of each subject, which can influence the drop out factor.

Therefore, the conceptualization of social interactions in the literature is still unclear; the investigations analyze several indicators, but the majority (six) do not use any educational theory in their studies. The affective aspects examined were personality and moods. They are still little explored and there is a lack of publications. The related works presented were relevant for the understanding and reflection on the social and affective aspects focused on DE, in which no specific article on this topic was obtained.

4. CONCLUSIONS

The potential of Virtual Learning Environments (VLE) and their tools provide students with spaces for constructing knowledge, interacting and feeling affection with other subjects in Distance Education (DE). From this perspective, this study analyzed socio-affectivity in DE.

Based on the results presented in this article, a gap can be seen in relation to socio-affectivity, as no study was found that addressed it in a unified manner. Thus, it was necessary to conduct two Systematic Literature Reviews. Research points to the need for technological tools to monitor and analyze interactions that occurred in the VLE. However, these functionalities still have limitations, making it difficult to use them to assist teachers. Thus, the inclusion of computer software that helps teachers meet the social and affective needs and demands of their students can promote more productive learning relationships.

Regarding the limitations of this research, it is important to note that, based on the data analyzed, it was not possible to identify a tool that analyzes the student's socio-affectivity. In view of this, as future work, we intend to develop a tool that automates the identification of social interactions and affective aspects in DE.

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