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Evaluation of web conferences by distance Higher Education students

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Abstract

Distance Education (EaD) is a teaching modality that has been gaining more space in Brazilian higher education. With the advent of new information and communication technologies, the use of tools such as web conferencing has gained prominence in educational technology, as it enables real-time communication. In this way, this work aims to evaluate the perception of academics of a semi-attendance course in Biological Sciences regarding the use of web conferences. The research was carried out in the context of Cederj and was aimed at students from the first period of the course. 207 students who answered an online questionnaire after the course's web conference sessions participated in the research. The answers were analyzed according to the thematization process proposed by Fontoura (2011). According to the students' perception, web conferences represent a fundamental resource for answering questions, enabling greater understanding of the contents studied. Despite the striking characteristic of synchronicity, most students suggested that web conferences could be recorded and the material could be accessed at other times and opportunities. There is also a strong demand for other courses and disciplines to make regular use of this resource, suggesting that the tool be inserted and systematized within the scope of distance Higher Education.

Keywords: Distance learning. Web conferences. University education.

1. Introduction

Currently, two types of teaching are recognized: face-to-face; the distance. The face-to-face modality is traditionally used in regular courses in which teachers and students meet in the same physical location, called the classroom, and these meetings take place synchronously. In the distance modality, teachers and students are physically separated in space and/or time. This type of education is carried out through the use of Information and Communication Technologies (ICT), enabling the establishment of the educational process (ALVES, 2011).

The search for technologies that favor dialogue between those involved in Distance Education (EaD) went through several phases. Initially, EaD was recognized as teaching by correspondence, and the main form of communication was through printed materials. Radio and television have made a decisive contribution to increasing and popularizing distance learning through the transmission of live readings and classes in a wide range of disciplines (SILVA; AMARO; MATTAR, 2019). This phase marks a break with the geographic distance of educational centers as these technologies have become more accessible. With the advancement of information technology, it was possible to increase communication, bringing multimodal resources, such as text, audio and videos in an integrated and simultaneous way (OLIVEIRA; SANTOS, 2020).

According to records of the National Education Council — CNE (BRASIL, 2014), the milestone of the use of distance education in the country occurred for educational purposes in 1936; in 1939, the Monitor Institute was created, offering technical-professional courses by correspondence (considered the oldest distance learning courses in the country). In the following decades, some initiatives were proposed in the EaD modality for higher education, highlighting its insertion in the Law of Guidelines and Bases of National Education (LDB) in 1996. In this way, the LDB regulates EaD at the federal level.

However, the evolution in communication means in EaD took place

decisively with the advent of the internet and the resources it provides. The internet generation known as web 1.0 provided its users with resources such as e-mails, electronic diary, websites with static content and various search engines. The user's role is characterized by a certain passivity with regard to their effective participation in the construction of available content. The trend in the modern world, however, is to make the internet a more collaborative medium in terms of generating, building and sharing content; this generation is known as web 2.0. Today, through the most modern features, platforms and applications, users have a more active and collaborative role within the network (MARTINS *et al.*, 2015; PEREIRA; OLIVEIRA, 2012).

Based on the evolution of the world wide web, its popularization and expansion of access over the years, EaD has appropriated the resources provided by the internet, which has decisively changed the molds and characteristics of distance learning (TAVUKCU; ARAP; ÖZCAN, 2011). The use of internet resources, associated with ICT, has allowed the expansion of pedagogical possibilities in distance education (SAYKILI, 2018). Despite this, its use is little explored by professors in Brazil, who are still limited to the use of web 1.0 generation tools (PEREIRA; OLIVEIRA, 2012).

According to Mattar (2011), the most adopted distance education model in Brazil starts with a content teacher, who produces content. Then, the content is worked on by an instructional designer and a web designer and, later, made available to the student, who is assisted by a tutor. This model culminates in assessment, which is often conceived as a separate, post-learning step. It appears that the traditional model of designing courses in EaD gives greater focus on aspects of production and content transmission, similar to the characteristics of the generation of internet web 1.0.

In this context, universities and higher education institutions that offer distance or blended courses have sought to use digital platforms and resources that enable students to explore the potential of web 2.0 in the teaching and learning process. The Virtual Learning Environments (VLE) themselves already have more modern resources that allow not only more efficient communication between those involved in EaD, but

also provide greater prominence for students in the construction and sharing of content among users (MUELLER; STROHMEIER; 2011)

As for the tools that enable greater student participation in Virtual Learning Environments, the following stand out: chats; Discussion Forum; wiki tools; web conferences (FERREIRA; LIMA; HORNINK, 2014). Among the tools listed, web conferences are closer to face-to--face teaching, as they enable synchronous communication between users mediated by audio, video and text resources. For this reason, it is believed that they have become one of the most popular tools in the context of remote learning experienced during the Covid-19 pandemic, in which face-to-face activities were suspended for a long period (RODRIGUES; DIAS, 2021).

Considering the growing use of web conferences in recent years and the lack of research that proposed to assess the role and importance of such a tool for the teaching and learning process (ROSSE *et al.*, 2019), the objective of this work was to evaluate the perception of academics from a semi-attendance course in Biological Sciences regarding the use of web conferencing in a first-period subject of the course. The research was carried out in the context of Cederj, a consortium of public universities in the State of Rio de Janeiro that offer distance learning courses (BIELSCHOWSKY, 2017). The characterization of the profile of students who regularly use the conferences and the objective assessments they made of this tool were analyzed in another study (ROSSE; ARAGON; OLIVEIRA, 2020).

2. Methodological design

The research carried out was descriptive, with a qualitative approach. This type of research seeks to describe characteristics of a given population or a given phenomenon and interprets them without interfering with or modifying the studied reality (COSTA; COSTA, 2009). The qualitative approach, in turn, involves obtaining descriptive data collected from the researcher's direct contact with the situation studied, emphasizes the process more than the product and is concerned with reporting the perspective of the participants (LUDKE; ANDRÉ,

2013). In this research, reports and interpretations of students in a new educational context were valued; therefore, descriptive research with a qualitative approach proved to be more appropriate and relevant for obtaining, interpreting and analyzing data.

207 students enrolled in the Earth Dynamics course participated in the research. It is a compulsory subject for the first period of the Biological Sciences Licentiate Course in the blended modality. The questionnaires were filled out using the Google Forms software and passed on to the students right after the web conference sessions. As web conferences were intended for distance tutoring, they are called video tutoring in the context of the institution — terms treated in this work as synonyms. The questionnaire link was sent by distance tutors, and data were collected throughout the 2020 academic semester.

The questionnaire consisted of objective questions that aimed to characterize the profile of students who made use of video tutorials. Thus, questions were included regarding the location used by the students to access the video tutorials, their frequency of access to the platform and the distance from their homes to the study hub. The questionnaire also contained evaluative items on an adapted Likert scale so that students could assess the new pedagogical mediation experience. These data were systematized using a quantitative approach and published in a specialized journal (ROSSE; ARAGON; OLIVEIRA, 2020).

The same questionnaire also contained two subjective questions, in which students could freely express themselves through a written record. The questions were as follows:

1. *What was the role of video tutoring for the discipline?*
2. *What suggestions/contributions would you add so that the tool can be improved?*

For the first question, 188 student responses were obtained; for the second, 147 student responses. Not all students answered the subjective questions, but it is believed that the number of answers obtained was sufficient to qualify the report of the students' experience in this new tool.

The analysis of the students' answers regarding the two subjective questions was carried out using a qualitative analysis methodology called thematization, proposed by Fontoura (2011). The author emphasizes that, upon reaching the data analysis phase, the researcher is faced with an often significant amount of information and a technique that enables a rich and in-depth analysis of collected data is needed (FONTOURA, 2011).

Qualitative analysis through thematization (FONTOURA, 2011) involves the achievement of some steps or steps. The first of these is the transcription of all material in oral or written form. As the answers were obtained through an online form, the researcher had access to all the written material without any form of identification of the students. The second step involved careful reading of the answers, letting the impressions and intuitions flow, and then specifying the focuses. The third step involved the demarcation of what was considered relevant, delimiting the corpus of analysis in the form of exploration of the material with a view to codification. As the questions presented to the students were well delimited, most of the answers obtained were part of the analysis corpus, except for a few that were outside the scope of the questions.

In the fourth step, the themes were raised, following the principles of coherence, similarity, pertinence, exhaustiveness and exclusivity. In the fifth step, there was the definition of context units and meaning units. As advised by the author, frames were generated based on the achievement of the previous steps (presented in the results and discussion section), which highlight the units of context and meaning; this step corresponds to the sixth step. Finally, the interpretation of data was performed, in light of the adopted theoretical frameworks, which corresponds to the seventh stage of the methodology proposed by Fontoura (2011).

3. Results and discussion

From the reading of the students' answers to the question "What was the role of video tutoring for the discipline?", a word cloud was created

in the free WordCloud software[1]. All responses were fully entered into the software; there was special interest in identifying which words were most used by students in their constructions.

It should be noted that the cloud is structured so that the most frequent words are represented proportionally larger in the cloud (Figure 1). Furthermore, as the students' answers represent entire sentences or paragraphs, prepositions, connectives or some of the pronouns used were removed, as they were not informative.

Figure 1 – Word cloud generated from student responses to the question "What was the role of video tutoring for the discipline?". Altogether, 188 responses were obtained; the most frequent words are represented proportionately larger in the cloud.

Source: created by the authors.

The word cloud analysis made it possible to identify that the words "doubts", "remove", "matter", "important", "clarify" and "clarifying" were widely used by students in their answers. This initial and simplified analysis provided support in identifying the most frequent recording

[1] WORDCLOUDS.COM. Free online Wordcloud generator. 2021. Available at: https://www.wordclouds.com/. Accessed on: December 21 2021.

units used by students in their responses. These units were grouped into categories, as well as their context units indicated.

Table 1, seen below, is the result of the sixth stage of the thematization process and indicates the main categories of responses and context units.

Table 1 – Categories generated from the theme "role of video tutoring" based on the thematization process (FONTOURA, 2011).

Theme: role of video tutoring	
Categories	**Context Units**
Clarification of doubts	"It helped me to clarify some doubts while reading the book!" "Very good, it resolved many doubts." "Important for answering questions and observing things I hadn't paid attention to."
Content understanding	"Essential for understanding. The Earth Dynamics matter is too dense, so it makes all the difference." "I found it significant, as the discipline needs video tutoring for a better understanding." "Fundamental, without it I would not have understood the content correctly."
Assistance in assessments	"It helped me understand the first job." "Explain doubts about AD1 of Earth Dynamics. Very well explained step by step, and the interest in helping so that everyone can do it without any difficulty. I really enjoyed this support from the tutor." "A very important role for us to complete what was asked."

Complementation	"Additional. The subject is quite complex, but the tutorials help to clarify topics." "Reinforcement of the content read before class and an additional explanation of the subject." "It helped to complement the content."
Approximation	"the only contact I had with anyone from the polo after the inaugural class." "It was a great asset, as I can't go to the polo." "Fundamental, as I live 80 km from my center and I can't go to face-to-face tutoring. I wish the stories had."

Source: prepared by the authors.

The response patterns that presented similar speeches were grouped in the same category. The most frequent response category presented by students in relation to the role of video tutoring was the category "clarification of doubts". According to the students' reports, this space for pedagogical mediation has been essential to clarify doubts or difficulties throughout the course.

It is important to emphasize that, in distance learning, students have greater autonomy in relation to their learning. Despite having access to several resources on the platform, such as mediation forums, tutoring room and complementary material, students identify that the monitoring carried out by mediators in these spaces is a fundamental element for them to better understand content covered throughout the course. the second most frequent category in student responses.

It is believed that, due to its synchronous structure, video tutoring is an important tool for tutors to be able to verify, in real time, information and content assimilated by students. If there is a gap, the mediator can take breaks and use other examples, analogies or exercises that facilitate the understanding and understanding of students. This

verification and adaptation is not always possible to be performed in asynchronous interaction tools; when it is, the exchange may be less effective, considering the response time between the posting of doubts and the mediators' responses.

Some students also identified that video tutorials helped in the construction of their assessments, whether in interpreting the information presented or in the mediators' expectations regarding the work. Other students indicated that video tutorials represent a complementary resource to the discipline. Others indicated that they promote rapprochement between tutors and students or between the course students themselves. This integration is essential for them to engage in the proposed activities, keeping themselves motivated throughout the school semester.

The students' perception of the tutor's role dialogues with what Scarpa (2015) discusses about the importance of discursive interactions between teacher-student and student-student, because, in this moment of exchange conducted by the tutor, it is possible for the student to build and re-elaborate the knowledge of what is covered. From this perspective, the need to invest in the initial and continuing education of teachers regarding the pedagogical use of media tools is indicated, in order to achieve better returns in the teaching and learning process in this type of teaching (CARLOS *et al.*, 2020).

One of the main challenges of Distance Education courses in Brazilian Higher Education is the high dropout rates. Many students enter this teaching modality situated in a traditional teaching culture, which values the transmission of content passively (NETTO; GUIDOTTI; SANTOS, 2012). This passivity, however, is counterproductive to the academic development of students in EaD. Many of them, not used to this new study routine, drop out of their courses, contributing with a significant portion of the dropout rates.

As a way of better adapting the student to the new teaching reality, universities seek to offer various assistance, monitoring and evaluation resources for students. One of them is face-to-face tutoring, in which a mediator of the subject itself is available at the face-to-face centers

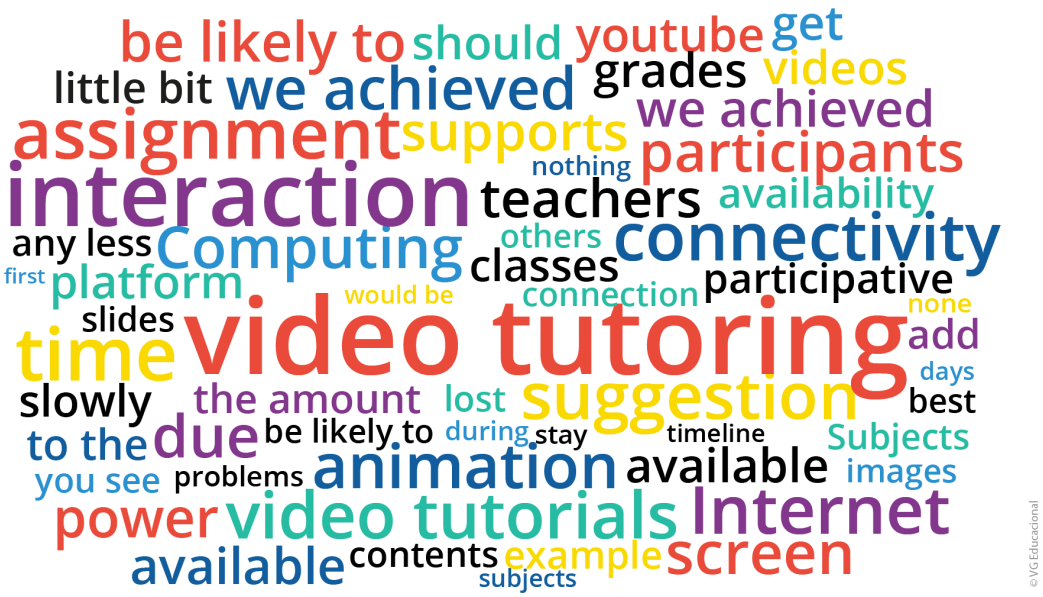
to better serve and monitor students (LEMOS; PASQUETTO, 2019). The dynamics of a tutoring does not work like a traditional class, as it is recommended that students study the material prior to face-to-face mediation — a methodology known as inverted classroom (HALILI; ZAINUDDIN, 2015).

Closer monitoring and in person is essential for students in the process of adapting to the new EaD routine and methodology (COSTA; KNUPPEL, 2014). Despite this, not everyone has the availability or resources to attend these spaces on a regular basis. Thus, video tutoring can offer pedagogical mediation to a greater diversity of students, especially those who would not be able to attend the centers in person, as reported in the students' own responses.

Oliveira, Weber and Floriani (2021) carried out a survey on the perceptions of higher education students about a web conference software. The students belonged to various EaD courses in a hybrid educational institution; at the time, face-to-face mediation meetings were replaced by synchronous mediation meetings, using the Microsoft Teams platform. The main advantages of the tool reported by students were the convenience and economy provided, as well as interactions with colleagues and professors. It appears that web conferences can meet a demand from higher education students for greater practicality and economy in relation to classes or face-to-face mediation meetings.

In the second question, students were encouraged to indicate suggestions and contributions so that the video tutorials could be improved. A structured word cloud was generated from the 147 discursive responses (Figure 2); the analysis of the cloud allows us to infer that terms such as "video tutoring", "platform", "disciplines", "recorded" and "connection" were intensively used by students in the construction of their answers. This initial analysis provided some indications of the main registration units used, but it was essential that the responses were read in full, following the steps of the thematization process (FONTOURA, 2011).

Figure 2 – Word cloud generated from student responses to the question "What suggestions/contributions would you add so that the tool can be improved?". In all, 147 responses were obtained; the most frequent words are represented proportionally larger in the cloud.



Source: prepared by the authors.

In the qualitative analysis by thematization, the same analytical categories proposed by Garonce and Santos (2012) were used. The researchers highlight that multiple roles are played in online education conditions, namely: pedagogical role; social role; managerial role; technological role. Thus, each suggestion or contribution indicated by the students was associated with one of these four roles.

The pedagogical role is what educators are more used to performing in their professional activities, their main function being that of mediator of knowledge through the definition of the curriculum project, desired objectives, covered content and didactic-pedagogical strategies used. The social role is linked to the establishment of a socially integrated environment, where all participants feel comfortable to make interventions, work in groups and promote discussions. The managerial role concerns the administration of scheduled activities according to available time, academic rules or deadlines. Finally, the technical role concerns the use of technology as an ally in the teaching and learning process, especially regarding the use of the software, so that it is

the most transparent and functional, ensuring smooth running of the sessions and connectivity of all involved (GARONCE; SANTOS, 2012; GARONCE, 2009).

Table 2, below, summarizes the four analytical categories used, as well as their respective context units. Of the 147 responses, 116 were associated with one of the four categories. The other answers (31) were not categorized, as they do not present a suggestion or contribution to the improvement of video tutorials, that is, they are beyond the subject of analysis.

The most frequent category in the students' responses was associated with the managerial role (68 responses), followed by the technical role (26 responses), pedagogical role (20 responses) and, finally, social role (2 responses). With regard to the category associated with the managerial role, the most common suggestions indicated by the students were that video tutorials could be recorded, remaining available for some time on the platform. Another common request among students was that other subjects in the Cederj consortium also make use of this pedagogical mediation resource (Table 2).

Table 2 – Categories generated from the theme "suggestions for improving video tutorials" based on the thematization process (FONTOURA, 2011).

Theme: suggestions for improving video tutorials	
Categories	**Context Units**
Pedagogical role	"Video tutoring's own questionnaires for students to solve together with the mediator." "Increase the duration of video lessons and teachers speak a little slower so those with slow internet can capture what was said in the video tutorial or those who don't understand at first." "More examples and exercises with animation during class."

Social role	"For people to participate more often, helping each other." "I believe students could use more of the shared grades."
Managerial role	"That the videos are available for a while, as I arrive from the service and it has always started or there are problems with audio or internet fluctuating, with the class being available on the platform, we could watch it any day or time, if we have the time." "Nothing to add. Just the suggestion that other disciplines also offer this support." "More video tutorials in the morning during the week."
Technical role	"The internet connection could be more stable." "Improved platform stability." "Pausing in some moments of the need for absence."

Source: prepared by the authors.

Martins, Quintana and Quintana (2020) report an experience in the use of web conferencing in the Distance Learning Administration course at the Federal University of Rio Grande (FURG): the classes, taught by web conferencing, were recorded and made available on YouTube. According to the authors, the recording served as a complementary element to student learning. The software used by Cederj courses for online conference transmission also allows recording, but this feature was not used by the discipline.

It is believed that the synchronicity of transmission is a major factor to promote interaction between students and between students and mediators. Watching video tutorials asynchronously considerably reduces the interaction between agents involved in pedagogical mediation. It is important to consider, however, that this was a very frequent and evident demand from the students and may provide better understanding

to those who wish to attend the tutorials at alternative times, or wish to attend them again for further revisions or, even, to serve those who they were unable to watch the broadcast in full, either because of incompatible timetables or because they did not have adequate internet to participate in the conferences in real time.

With regard to the technical role, most students indicated problems in the connections or stability of the platform, generating some noise, especially in audio transmission. Such obstacles were also reported by other authors as one of the main problems to be overcome, aiming at better quality in the transmissions and, consequently, the quality of the teaching and learning process in this new environment (DOTTA *et al.*, 2014).

Regarding the pedagogical role, several suggestions were made by the students. Some suggested that the mediator speak more slowly; others suggested more frequent use of video resources, in addition to a list of exercises to be performed during transmissions. Regarding the social role, the students suggested a better socialization process for this synchronous virtual space of interaction.

The qualitative results obtained through thematization analysis provided subsidies to better understand new spaces of pedagogical mediation, which are being used more frequently by all institutions, whether they are classroom or distance learning.

4. Final considerations

Web conferences represent a tool with a lot of potential for the teaching and learning process in EaD, especially due to its multiple features. In the new Covid-19 pandemic context, conferences started to be used in the most diverse educational fields for the most diverse purposes: meetings; guidelines; follow-up; above all, conducting synchronous classes.

Despite its massive use, there are few researches that propose to analyze and evaluate the use of this tool in EaD courses. Identifying the students' conceptions regarding the use and contributions of this tool

is, therefore, an initial way to better assess the impact and projections that web conferences can have in the field of distance education.

According to the students' perception, web conferences represent a fundamental resource for answering questions, enabling greater understanding of the contents studied. Students in EaD modality do not always have resources to present and solve their doubts in real time; therefore, it is advisable that web conferences are used more for this purpose, especially since it is an indication of the students themselves.

Despite the striking characteristic of synchronicity, most students suggested that web conferences could be recorded and the material could be accessed at other times and opportunities. It is believed that such demands happen due to recurring technical problems that occur during real-time transmissions. There is also a strong demand for other courses and disciplines to make regular use of this resource, suggesting that the tool be inserted and systematized within the scope of distance Higher Education.

The study carried out has some limitations, as it assessed the reality of a single course and discipline. However, this path was chosen, as it is a discipline that used web conferencing on a regular and systematic basis throughout the academic semester, in addition to already having a body of tutors used to providing distance tutoring through this means. Thus, it is essential that web conferences are evaluated in other educational and methodological contexts, aiming to bring new contributions to the use of this tool in the educational sphere.

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