

New Technologies in Education: Digital platforms usability

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**Keywords— Education, Online Plataforms,
Usability, Remote Learning, Teachers and
Pupils.**

Abstract— This essay aims to present High School and undergraduate pupils and teacher's perception as online platform users for remote classes at Brazil. Thus, researches have been conducted through an online questionnaire which made it possible to confirm that perceptions regarding the use (usability) and the emotions (psychological) are caused by this type of teaching. The aim of this study is to diagnose the positive and the negative points that the users showed while interacting in remote classes, their suggestions and their notes for improvements.

I. INTRODUCTION

In March 2020 all types of educational institutes had to discontinue their face-to-face classes which required adapting them to the virtual environment due to the forced lockdown because of the high level of contamination caused by the Covid-19 Pandemic.

Current teaching through online platforms and other digital resources such as recorded video classes and material sharing became popular as Emergency Remote Teaching (ERT), which arose several ways to deliver the content that should be applied as well as the fulfilment of the academic planning schedule.

It is believed that such social isolation measures which were adopted as a way of controlling and restraint to the spreading of the new corona virus was a modality to rush the development of the 4.0 education, in other words, the fourth Revolution that takes place through technology innovation.

However, this study aims to check the perception of High School and undergraduate students and teachers/professors while using the online platforms for their remote classes, also to report their main experiences (positive and negative ones) during this interaction.

For this, Bibliographic, Exploratory, Quantitative and Qualitative research have been conducted in order to deepen the knowledge about the usability of the most popular platforms used for remote teaching. A research based on questionnaires was applied to students, teachers and professors which intends to confirm both the use and the emotional perceptions that this type of teaching is causing. It also intends to understand how they are interacting during the teaching/learning activities, and based on this diagnose, new studies will be enabled in order to provide refined solutions to the remote teaching platforms.

1. Emergency Remote Teaching (ERT)

Although it is strictly related to the use of digital technology, Remote teaching must not be taken for Open and Distance Learning (ODL). According to Garcia, Morais, Zaros e Rego (2020);

Remote Teaching allows the use of platforms already available and open for other purposes which are not exclusively educational, as well as the addition of complementary tools and the introduction of the groundbreaking practices. [...] Teaching remotely allows school content sharing

in classes organized through profiles [environments controlled by login and password] created in the teaching platforms, such as, SIGAA and MOODLE, apps like Hangouts, Meet, Zoom ou social networks. (pág. 5)

The authors quoted above call attention to the importance of the coverage of meaningful learning, where knowledge should be embraced by the students' intellectual world as well their experiences.

Morer (2008) apud Gabardo, Quevedo e Ulbricht (2010) defend that successful online learning finds its balance between education and the institutional design: in other words, educational Direction opposed to technology Direction. It is not possible to consider one and discard the other.

How can we provide everyone with access, improve the use of skills and add quality to usability? A Society which encourages innovations and develops through studies must have everybody together [...] E-learning for all requires bringing down boundaries for those who don't have access to new infra-structures of knowledge. Opening up to inclusion involves extending na invitation to all groups (stakeholder groups) towards a dialogue about how the boundaries of motivation, technology, pedagogy and access can be brought down. (EHLERS, 2008, p. 17).

According to Behar(2020), in Open and Distant Education (OLD), teaching and learning processes happen due to the use of information and communication means and Technologies with pupils , tutors and teachers who are developing educational activities in several places and times. In other words, it has its own didatic-pedagogical system, through vídeo-classes, complementary material suggested by the teacher and the application of tests by the endo f each video-class. There is no interaction among students. They can watch the classes whenever they have time and their doubts can be solved by the subject's tutor.

1.1 Teachers/Professors

Considering the great education challenge despite the source, distant learning becomes even more complex. For Garcia, Morais, Zaros and Rego (2020) while in remote classes teachers and professors face the same challenges as they do in formal education such as introducing the contented, setting learning goals and submitting assessments.

Table 01 Illustrates what remote teaching must be like;

Table 01 – Remote Teaching according to Garcia, Morais, Zaros e Rego (2020 page 9)

Communication with the student	It can be synchronic (in real time) or asynchronous (in a diferente time), as well as in a standard class.
A more significant use of resources (technological, digital or analog)	Although technology is already been used in a daily basis, its use is now for educational purposes. The use of technological resources is included as part of the job [delivering classes], confirming one's expertise in communication technology.
Planning concerning the step's time management	Steps that should be related to the typical teaching process, such as introducing the content, time for intervantions and questions, time for Reading, Ações que devem estar relacionadas aos aspectos típicos da didática do ensino como: apresentação de conteúdo, oportunidade para intervenções e perguntas, tempo para leitura, further development and leaning assessment techniques.

In order to organize the activities, the teacher need to master the means for introducing the content, in other words, digital means such as platforms, apps medias. Also, they must master the methods and the processes that will be used [leaner-centered approach, hybrid teaching, questioning, etc.], besides paying close attention to the application of the learning rules.

Once these demands have been met, the teacher/professor starts to plan the lesson and sets the goals of the teaching/learning process, the contents and the evaluation process concerning the power of teaching techniques.

According to Gabardo, Quevedo e Ulbricht (2010) it is imperative that the Educational institutes develop online education projects focused on changing paradigms and the creation os a new culture in terms of this teaching style since this style has become a well-established and permanent pattern.

Nowadays, the development of new efficient methods of education are absolutely significant for building a Society based on knowledge, which demands more than just simple qualification, in other words, not only learning how to use technology, but also evolve in terms of thinking and acting in the teaching/learning process.

1.2 Pupils

One of the most challenging aspects of Remote Teaching is the pupils interest. For that, the lesson presentation must be as, or even more, attractive than what is available in open communication social networks.

Feitosa, Moura, Ramos and Lavor (2020) conducted a research with students which reports some complaints concerning remote teaching: the lack of interaction with students and teachers because they do not feel comfortable to take active part in class and to report their doubts; they want practical classes in labs; they claim to prefer hard copies of their books, therefore they need the library; and last but not least, they find online classes more tiring.

So that learning happens in a more spontaneous and motivating way, it is important to keep students' interest in the subject, making it easier for them to organize and cope with their state of mind, for instance, establishing a routine with a clear schedule, sleep well in order to have more concentration during class. Also, they should find na appropriate place to attend the classes, keep their material within reach and, if possible, assure good internet connection because it is known that the lack of e-accessibility is accounted for demotivation and dropouts.

1.3 Usability

So that users have a use experience either with a physical or virtual product in an efficient and pleasant, in this case, concerning digital platforms in particular, the ISO 9241-11 sets the goals of usability, which are: developing mechanisms that facilitate and promote success and satisfaction with the experience and the performance, without requiring previous knowledge from the user in relation to the technology. Such rule is based on three main pilars: Efficiency, Effectiveness and Satisfaction.

According to Costa e Marques (2001), Efficiency aims to measure the coverage and accuracy of the user when reaching his/her goal. Effectiveness assess the resources used in order to reach the goal: the more resources, the more effort and the least efficiency. And Satisfaction assures the comfort and the favorable reaction with which the user reaches his/her goals.

In order to guarantee the best use experience, ergonomic and heuristic criteria of the usability are applied to the development of Technologies and other platforms. Although this article does not intend to carry out such evaluation in the presented moment, such knowledge is the foundation for the development of the new technologies and to assure a its successful interaction with its users.

II. METHOD

Based on the presented bibliographical survey, two (02) questionnaires have been applied through Google Forms, targeting teachers/professor and pupils respectively. In both questionnaires, the participants were well aware and agreed with the Consent Form (TECLE) – (mandatory term in request to the 466/12 –CNS-MS resolution).

The questionnaires addressed to High School and Higher Education (undergraduate and Lato and Stricto Senso students) and to the teachers/professor, were developed aiming to collect information about the experience and the usability in remote education through digital platforms.

It contains twenty (20) quali-quantitative questions which refer to the adopted platform, lesson's running time, familiarity with the technology, use experience, feelings and emoticons, assessment and pinpointing suggestions and improvements.

III. RESULTS AND DISCUSSION

3.1 Teachers/Professors

In all, 37 answers were collected between April 1st and May 1st, 2021. The questionnaire was split in two parts. The first one contained questions which referred to the given classes and the second was about how one was feeling during the remote class period.

Higher Education professor are the majority of 83,8% of the answers. 17,2% teach High School classes, training courses and other types of courses. From this percentage, 67,6% give live classes and 27% give hybrid classes, which are live and recorded classes. 19 teachers (51,4%) use Google Meet (Classroom); 16 (43,2%) use Microsoft Teams; followed by Zoom: 3 professionals (8,1%). 02 claimed to use Blackboard and the others YouTube Live, WhatsApp, Big Blue Botton and Cisco Webex as you can see in graphic 01.

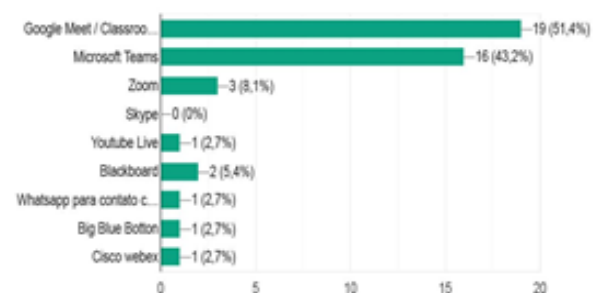


Fig.1: Graph of the most frequently used teaching platforms adopted by teachers.

45,9% said that they did not get any training, while 43,2% said that they had been provided with it. 8,2% seek for other qualification ways such as: videos, tutorials and colleagues' help. It is remarkable that in all 54,1% of the interviewees did not have any kind of training and, as a result, they had to look for other alternatives.

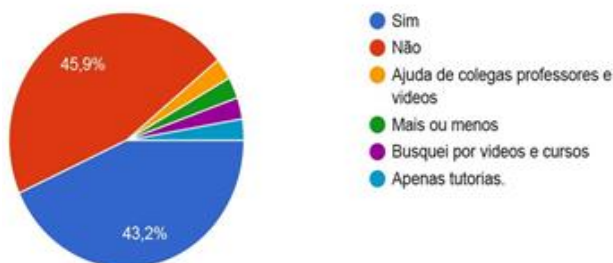


Fig.2: Qualification and training graph

The three biggest difficulties in relation to the platform and remote teaching reported by the interviewees were: technical and operational problems of the platform(29,7%); difficulties in assigning homework to students (16,2%) and 13,5% had problems in organizing the online content. Also,13,6% reported problems concerning students' interaction, unstable internet connection and that the platforms do not offer appropriate tools to a class, a total of 73% of the teachers claimed to have faced some kind of problem. On the other hand, 27% confirmed not having had problems at all.

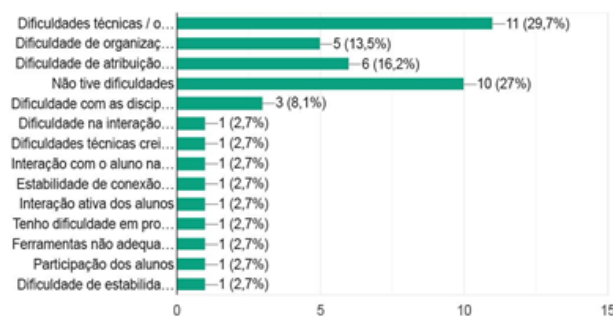


Fig.3: Main problems graph

The age range of most of the interviewees is between 36 and 55 years (75,8%), 39,4% ranges from 36 to 45 years and 36,4% ranges from 46 to 55 years. 9,1% are between 55 and 65 years and only 15,2% of the teachers are between 26 and 35 years-old.

Regarding the classes, 62,2% delivered theoretical and practical classes; 24,3% delivered only theory and 13,5% only practice. The average running class time, the answers were varied, ranging between 1h30 and mostly 3h00.

About the feeling regarding remote classes, 13 teachers said to be discouraged; 10 feel frustrated and 6 reported annoyance and sadness. Other feelings such as fear, listlessness, emotional distress, uncertainty, anxiety and exhaustion have been mentioned. They also reported fatigue, headaches and voice failure.

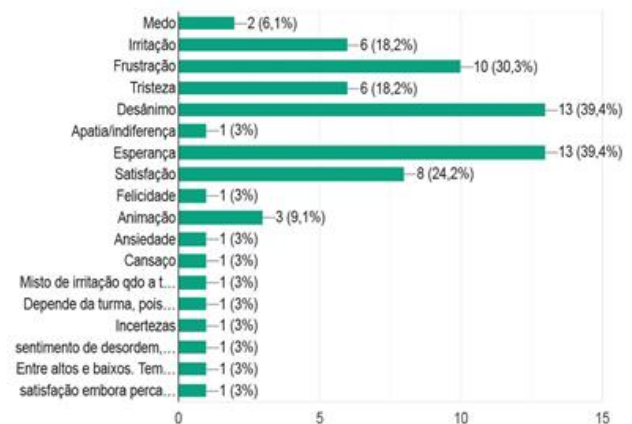


Fig.4: Feeling towards remote class graph.

It is possible to note the most of the feeling pointed by the participants were negative ones, especially because the majority showed difficulties while using the platforms, which includes lack of qualification or even a sponsorship in terms of money and equipment operation (digital accessibility which was mentioned by one interviewee). Peer interaction also suffered damages according to the participants. However, there still is a small portion with signs of hope regarding this teaching approach.

Regarding the lack of interaction, many students said that they did not turn on their cameras and that they did not took active part in the class. In general, teachers were worried about their pupils learning results and about how to assess them. Despite that, 13 interviewees were hopeful, 8 are satisfied and 3 are excited.

When asked about student's interest and attention to their subject in the remote style, in a scale from 0 to 10, meaning that 0 is absolutely negative and 10 is absolutely positive, results showed that 11 answers were between 5,0 and 4,0 points, while 22 answer were above 6,0 points. From these asnwrs, most of them (8 answers) with 8,0 points, followed by 7 answers with score 7,0. 3 answers had score 9,0 and 6,0 each and one with 10,0. It shows that despite the problems presented by the teachers/professor, most of them still have a posithev evaluation regarding student's interest and attention to class. There has been no register of an answer below 4 points.

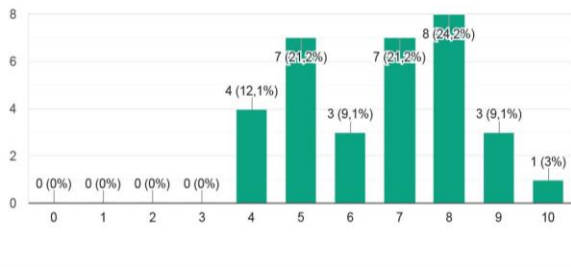


Fig.5: Graph about the score related to student’s attention regarding remote teaching.

Regarding the remote teaching/learning process, the following suggestions have been made:

1. Teacher’s qualification in order to use the platforms;
2. Sharing multiple screens and allowing better image quality;
3. Correspondence among the tools: storing the recorded classes for indefinite time.
4. Interactive board: tool used to doodle on the screen that can be shared with the student in real time with easy manual expression.
5. Improving the tool “allow control” on MSTeams.
6. Lower the time for classes in video-call.
7. Appropriate tools to use the apps on the computer as well as on the mobile phone;
8. Digital Aecessibility to professionals and pupils: equipment and internet connection;
9. Splitting students in diferente meetings to allow group work;
10. Suggestion to improve Meet: allow seeing students while sharing the screen as it is like in Zoom, without the need for another window.
11. Having a channel or a tool to assess and give feedback on the teaching/learning process that is more efficient and to confirm its effectiveness.

1.4 Pupils

Altogether, 116 answers were collected between April 1st and May 1st, 2021. Among the students who took part in the survey, only 7,8% were under 18. The great majority (70,7) are between 19 and 25 years, followed by 17,2% who are between 26 and 35 years, which is a total of 87,9% of the participants. The smallest share (4,3%) is up to 45 years.

80% of the participants are undergraduate students, 7,8%are attending a Master course, 7% are Lato Senso extension students, which is a total of 94,8%. Only 5,2%

are in High School. All students confirmed having had remote classes, and 7,% of them claimed to have had hybrid or blended classes, which means, partly remote and partly face-to-face

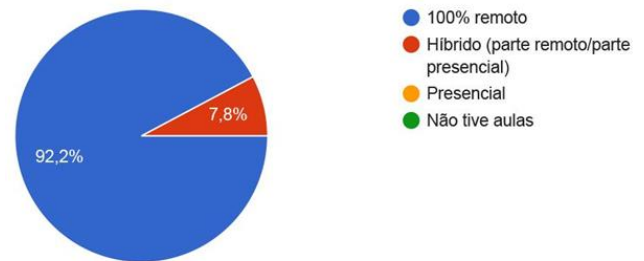


Fig.6: Remote synchronous and asynchronous classes graph.

Regarding the synchronicity of the classes, only 6,9% had asynchronous classes, in other words, with recorded vídeos and/or mailed vídeos. The other 93,1%had synchronous classes, which means, live classes in several platforms available, and most part of the users were in Google Meet (Classroom): 70,7%; followed by Microsoft Teams: 31% and Zoom: 20,7%. In a smaller scale, Skype was mentioned with 3,4% and Youtube Lives with 2,6%, which is a total of 6%. The other 5,3% correspond to less frequently used platforms: Zoom Cloud Meetings, Moodle e Blackboard.

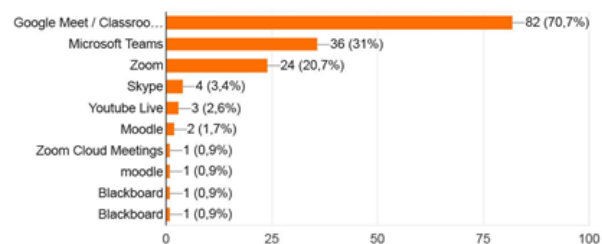


Fig.7: Platforms used for teaching graph.

Regarding the devices, 92,2% had access to classes mostly on their computer, while 7,8% had access by their phone.

Class running time was reported to have 18,1% over 2h45; 42,2% were said to last between 1h45 and 2h30 and 38,8% between 45’ and 1h30. From these participants, 36,5% said that there is not a break. 52,2% have a break that ranges between 10 to 15 minutes and 9,6% have up 30 minutes break.

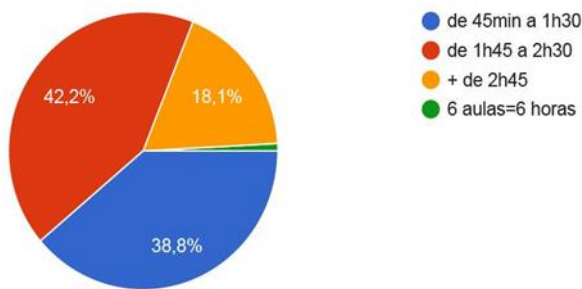


Fig.8: Class running time graph.

Regarding the satisfaction to this break, 56,5% believe that this amount of time is not enough to rest and return to the activities and 43,5% feel comfortable and agree that the time is sufficient to rest and return to work.

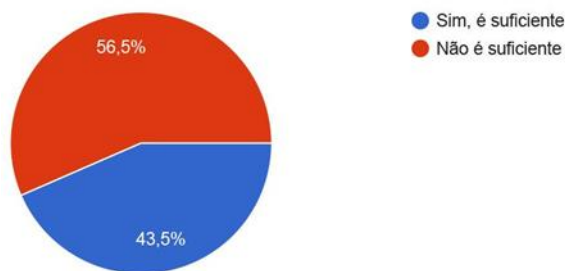


Fig.9: Satisfaction regarding break time between remote classes.

Most students reported that they turn on the camera only when they are asked to do so (63,5%), 27% do not turn it on at all and only 8,7% keep their câmeras on most of the class.

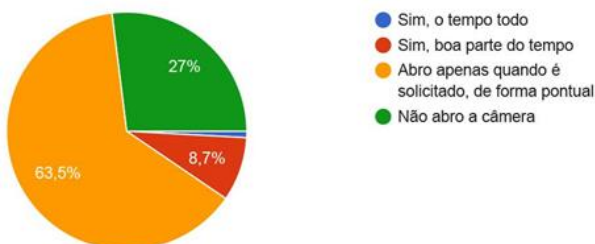


Fig.10: Graph about the use of câmeras in remote classes.

On the one hand, those who were asked whether they felt comfortable with their cameras on, 3,5% reported to be constrained. On the other hand, the same percentage (3,5%) reported that there was no constraint at all. The biggest share (45,2%) claims not to feel comfortable,

30,4% are unaffected, which means that they do not bother, and 17,4% will definitely not turn their câmeras on. It is clear that using the camera is not welcomed by most of the students (66,1%)

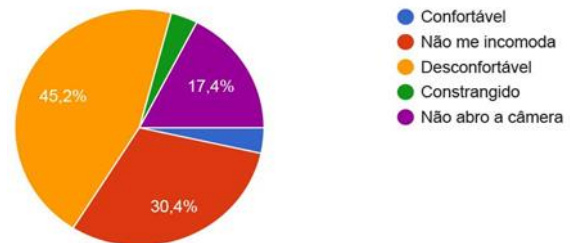


Fig.11: Graph about how students feel about turning their cameras on during remote classes.

After evaluating from 0 to 10 their satisfaction regarding remote teaching during the pandemic, 0 meaning absolute diss, 5 is the average which means students are unaffected by the situation, and 10 showing complete satisfaction. Results show that 21 students (18,1%) graded 5. Other 33 students (28,5%) reported dissatisfaction as their grades was below 5.

So, those who are dissatisfied correspond to 46,6% of the participants, which shows that, compared to teachers, students are even more upset with this teaching/learning style. In relation to the scores given which were between 6 and 7 points, corresponds to 31% of satisfied participants, and between 8 and 10 points, reported even more satisfied participants, a total of 62 students (53,4%) revealed their satisfaction.

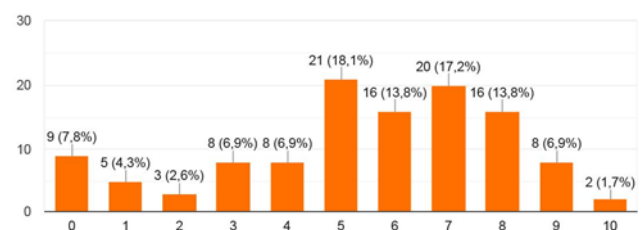


Fig.12: Graph about the use of cameras during remote classes.

The last question was optional and it was about recommendations to improve this teaching process:

1. Professor should reduce the demand for homework and projects as it has become exhausting. Demands on projects have increased significantly with remote teaching;

2. Breaks every hour as it is tiring and uncomfortable to be in front of the screen for long hours without a time to rest. Besides that, it is hard to focus.
3. More rapport from everyone: both speakers (teachers and professor) and listeners (students);
4. That classes were recorded for further revisiting, or even to be watched at any other time;
5. Teachers' qualification and support to operate the technology;
6. Shorter classes, focused on the content instead of the course load accomplishment.
7. More interaction among teachers and student through active methodologies, in other words, activities that require active participation from students instead of only expository lectures.
8. Improving visual aids in order to facilitate learning and hold their attention;
9. Having a schedule containing deadlines and course content; and making it available to student so that they can have a clear view of the course;
10. Avoid showing videos during class. Assign them for recorded classes and only bring the content for discussion in class;
11. Smaller groups with 10 to 15 students to facilitate interaction, content delivery before class discussion, feedback about the class to check whether students are following and learning successfully;
12. Understanding the remote classes cannot be delivered as a face-to-face class, in other words, avoid adapting face-to-face to remote. Although the goal is the same, they are still different things.

IV. CONCLUSION

Professors and students had been familiar with face-to-face classes and, due to the Covid-19 pandemic, had to face the need for social distancing, which caused an abrupt and dramatic break in the already existing teaching style. The solution for this problem was the adoption of the Emergency Remote Teaching (ERT) in all levels of education.

This research aimed to confirm the perception of students, teachers and professors from High School and Higher Education (undergraduate and extension courses), while using online platforms for remote classes and to pinpoint their experiences. As remote teaching is a style

that has, for first time, become part of most of these people's lives, presumably, will continue to be for a long, if not, indefinite time.

Through this survey applied online, via Google Forms, it was possible to confirm the perceptions for both use (usability) and emotional (psychological) which this teaching style causes, since usability involves the aspects of efficiency, effectiveness as satisfaction regarding the products.

According to the survey applied to teachers and professor, we now understand that half of the interviewees received no training at all and from these interviewees, more than 70% reported trouble in working with the platform, such as technical and operational as well as homework assignment.

The lack of interaction with students who do not turn their cameras on and do not take active part in class, already mentioned in this research, may have been one of the reasons why teachers/professor feel discouraged, frustrated, annoyed and sad. According to the answers, other feelings were also reported: fear, listlessness, emotional distress, uncertainty and exhaustion. Fatigue, headaches and voice failure were also said to have happened.

However, as almost 40% of the professionals feel discouraged, the same percentage feels hopeful, which can be reassuring given the circumstances.

For the students, the greatest dissatisfaction was in relation to remote classes. They would appreciate if classes were shorter because they feel very tired and they lose focus after one hour in class. We noticed that the use of cameras is not considered a positive aspect for most students. However, they believe and understand that rapport is important coming both ways: from students and from teacher. Moreover, educational institutions must provide professionals with qualification in order to make accurate use of Technologies and active methodologies.

In face-to-face teaching, for many times, students' performance was passive towards the content given, regarding practice and teaching techniques. With remote teaching, we were able to observe students also playing their roles as a co-author and taking responsibility over their own learning process.

In general, both users (professionals and students) reported their experiences in a more negative way, mainly to what refers to their difficulties and limitations. This way, we can conclude that both professionals and students require a more empathic and receptive attitude among each other and also towards the new technologies. Teaching and learning will happen in this new context and a scenario

common to all, in other words, teachers and students will have to be responsible and committed to the teaching process.

As for further studies, the suggestion is to make an analysis based on the diagnose introduced by this research, as well as on ergonomic and heuristic criteria of the usability of the main platforms previously mentioned by the users in order to suggest improvements on the systems. This way, we are looking for the decrease on hostility towards technology and, consequently, making the learning process more efficient and effective. Also, this can maximize the comfort and satisfaction of the users, which may contribute positive and significantly to the teaching/learning process.

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