

ENVIRONMENTAL EDUCATION AND COVID-19: LEARNING, DIGITAL TECHNOLOGY, AND THE USE OF YOUTUBE AS A TEACHING PLATFORM IN PANDEMIC

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ABSTRACT

Environmental education (EE) is an indispensable and urgent cross-cutting theme for society. The isolation brought about by the Covid-19 pandemic has profoundly changed social relationships and daily routines. In the teaching context, digital technology and e-learning have gained emphasis in academic activities and events. The objective was to identify and discuss how YouTube™ supported the expansion of higher education. The qualitative study examined 283 videos on YouTube™ posted between February 2020 to February 2021, which went through exploratory, bibliographic, and thematic analysis. Watching online videos is one of the most performed activities in Brazil, according to data from PNAD (2017), and, in the learning process, YouTube™ presents the most effective resources in supporting the dissemination of e-learning by university students through web events. In general, YouTube™ videos have widely served to meet the interests of various institutions that sought success, ease, democratization, and dissemination of audiovisual content but urgently need to expand the digital accessibility of their events to people with visual and hearing disabilities.

Keywords: Teaching. Inclusion. Socioenvironmental. Sustainability. Ecosystem.

EDUCAÇÃO AMBIENTAL E COVID-19: A APRENDIZAGEM, AS TECNOLOGIAS DIGITAIS E O USO DO YOUTUBE COMO PLATAFORMA DE ENSINO NA PANDEMIA

RESUMO

A educação ambiental (EA) é elucidada como tema transversal indispensável e urgente à sociedade. O isolamento acarretado pela pandemia da Covid-19 modificou profundamente as relações sociais e rotina diária. No contexto de ensino, o uso de tecnologias digitais e o ensino a distância ganhou ênfase na realização de atividades e eventos acadêmicos. O objetivo foi identificar e discutir como o *YouTube*™ deu suporte ao ensino superior na expansão da EA. O estudo qualitativo examinou 283 vídeos no *YouTube*™ postados entre fevereiro de 2020 a fevereiro de 2021, os quais foram submetidos à análise exploratória, bibliográfica e temática. Verificou-se que assistir vídeos online é uma das atividades mais realizadas na internet do Brasil, segundo dados da PNAD (2017) e que no processo de aprendizagem, a plataforma *YouTube*™ apresenta os recursos mais eficazes no suporte ao processo divulgação e aprendizagem da EA por universitários através de web eventos. Em geral, percebeu-se que os vídeos da plataforma em questão têm sido amplamente utilizados para atender aos interesses das mais distintas instituições que buscaram êxito, facilidade, democratização e disseminação de conteúdos audiovisuais, mas

que necessitam urgentemente ampliar a acessibilidade digital de seus eventos às pessoas com deficiência visual e auditiva.

Palavras-chave: Ensino. Inclusão. Socioambiental. Sustentabilidade. Ecossistemas.

INTRODUCTION

The relationship between human beings and the environment is constantly changing, being necessary to reevaluate actions, attitudes, and ways of modifying the environment, especially how to use the available natural resources, principally the non-renewable ones. Thus, society and nature have undergone several changes since the industrial revolution, which have brought a super consumption associated with the overexploitation of natural resources and, consequently, significant environmental impacts.

Thus, the capitalist system is almost directly intrinsic to human needs, from basic to superfluous, generating an accumulation of objects and substances that, when improperly handled, affect the environment. According to Dias (2004), Environmental Education (EE) emerged in the 1970s to raise awareness of environmental problems and establish a harmonious relationship with nature based on sustainability and good quality of life.

The current health and humanitarian crisis resulting from the new coronavirus pandemic (Covid-19), which preaches social isolation to halt the advance of the disease, leads people to think about the current needs and consumption patterns, especially the relationship between zoonoses and ecological degradation. Besides generating environmental and public health problems, the crisis directly impacts the world economy.

Answering questions such as the importance of environmental education during the pandemic and how current methods and platforms, especially YouTube™, can contribute to the continuity of e-learning even when social distance is necessary is the objective of this study. It ponders, above all, the relevance of digital tools in environmental education, from the sensitization and awareness of people in the current pandemic scenario to the importance of sustainable use, protection, and conservation of natural resources.

Despite serving the entire community, the research targets students and education professionals, helping to understand how digital platforms are relevant in fostering critical and emancipatory e-learning. This crisis shows that e-learning will be a significant form of spreading knowledge since it reaches several people and isolated social groups.

LITERATURE REVIEW

A Brief History of Environmental Education

The human lifetime on Earth is short concerning the age of the planet. However, the environmental impact caused by humans is immeasurable. The desire to accumulate wealth, dominate nature and satisfy needs makes the human being a threat to ecological conservation and balance and maintenance of processes and essential ecosystem services (MOREIRA, 2001).

After the World Wars, the disordered growth of the population and the capitalist ideals fed the idea of economic growth and progress at any cost. As a justification, the misuse

of nature is a necessary evil because economic growth depends on this exploitation, and environmental preservation is an obstacle to this development.

Such an idea was successfully spread until the end of the eighteenth century, abolishing concerns about the impacts on the environment and giving the impression that natural resources were inexhaustible (BURMANN, 2010). Moreira (2001) reinforced that humanity consequently began to produce frenetically and pollute similarly. Vestena (2016) points out such a problem and adds that natural ecosystems have lost the resilience to constant environmental damage, thus compromising the dynamics and balance.

The evil arising from this predatory and outdated economic growth model became evident in the late nineteenth century, causing especially developed countries to seek less impactful alternatives for exploitation and development (SISINNO; OLIVEIRA, 2000).

Environmental problems such as the London fog and the disasters of Minamata, Niigata, and Bopal have revealed the risks and environmental, social, and economic impacts of this disordered exploitation and awakened the urgent need for a globalized and thorough discussion on environmental changes, as well as the development and implementation of actions and policies aimed at environmental conservation (RAMOS, 2001; VESTENA; OLIVEIRA, 2016). Thus, e-learning is a result of these discussions and an essential tool for a sustainable growth model (CARVALHO, 2008 GUARIM, 2002).

In Brazil, this ideal became notorious in the mid-1980 with the release by UNESCO of the document entitled Environmental Education: the Major Guidelines of the Tbilisi Conference. This material, resulting from an intergovernmental conference, addresses the actions to be implemented through e-learning and suggests that the activities should be continuous, interdisciplinary, and cross-cutting. Thus, one can acquire knowledge, values, behaviors, and skills to participate responsibly in the prevention and solution of environmental problems and the management of environmental quality (UNESCO, 1998, p. 98).

E-learning becomes pedagogical in nature in the 1980s, being mandatory in the National Curriculum Parameters and Law No. 9.795, April 27, 1999 (BRASIL, 1999), which provides e-learning, establishing the national policy for environmental education and other provisions. According to it, e-learning should be mandatory in public and private educational institutions interdisciplinary way at the different levels and modalities of education. According to Art. 1, e-learning is:

A set of processes through which the individual and the collectivity build social values, knowledge, skills, attitudes, and competencies aimed at the conservation of the environment [which is an] asset for common use by the people, essential to a healthy quality of life and its sustainability. (BRASIL, 1999)

Thus, e-learning has been integrated into Brazilian education from basic to higher education as a cross-cutting theme in the Parâmetros Curriculares Nacionais (National Curriculum Parameters, PCN). Also, it reaffirms the need to work on issues related to the environment interdisciplinary to promote environmental awareness (SANTOS; COSTA, 2013).

It is worth noting that, as stated by Santos and Sato (2003), educational practice alone will not solve environmental problems. However, it is an effective tool since it forms critical and aware individuals of their role in society.

Issues related to the philosophical assumption of e-learning underwent discussion by Karl Max and Paulo Freire, who believed in the formation of a student-citizen subject directed through actions and reflections carried out in an integrated way. Knowledge would make the subject aware of his freedom while making him politically aware and ethical. In other words, he assumes responsible choices in the face of his freedom while concerning about others and the environment in which they live.

Dias (2004) establishes that academic environments are proper to promote environmental awareness. Through discussions in learning environments, the forms of knowledge are in the range of students, thus assisting in their academic training and developing habits and healthy attitudes toward conservation and environmental respect. Such practice transforms into conscious citizens breaking traditional teaching and increasing the participation of teachers, students, and the community.

Environmental issues go beyond epistemological knowledge since increasingly new approaches assist the search for conscious awakening and promotion of sustainable habits (OLIVEIRA, 2009). Santos and Sato (2003) affirm that e-learning has suffered worldwide criticism, pointing out that some authors suggest changing the term e-learning to Education for Sustainable Development. Thus, the actions would solve environmental dilemmas and encompass other spheres of economic power, multiple social and cultural manifestations, and the educational system.

According to Guerra (2020), the effects of widespread environmental degradation, the ineffectiveness of actions aimed at ecological awareness, and the vulnerability of the human species came to the fore with the current health crisis arising from COVID-19 (Sars-Cov-2), declared as a pandemic by the World Health Organization (WHO). Santos (2020) further argued that the pandemic is a reflection of human activity since the 17th century by stating that:

The Coronavirus pandemic is one manifestation among many of the models of society that began to impose itself globally from the 17th century on and which is reaching its final stage. It is the model that is leading humanity to a situation of ecological catastrophe. Now, one of the essential characteristics of this model is the unlimited exploitation of natural resources. This exploitation is fatally violating humanity's place on the planet (SANTOS, 2020, p. 22).

Social distancing and solation are still pointed out as the most efficient measures to reduce the risks of contagion and circulation of the virus (WILDER-SMITH; FREEDMAN, 2020). Given this context, in addition to commerce and industry, educational institutions (schools, universities, among others) were also directly affected, having their classroom activities suddenly ceased, without enough time to think and discuss new teaching and digital inclusion alternatives (HONORATO; MARCELINO, 2020).

With the institutions closed, the whole academic community (managers, educators, students) was faced with another challenge: how to continue the educational practices when it was impossible to return to face-to-face activities? Remote learning, using the internet and digital platforms, seemed to be the best alternative. Honorato and Marcelino

(2020, p. 209), stated that to minimize the damage to the teaching-learning process of students, teachers seek to make their students learn content considered socially necessary while waiting for the return of face-to-face classes.

In this panorama, there has been considerable growth in the use of digital technology for the dissemination of knowledge, whether informal teaching activities or in scientific dissemination events (colloquia, symposia, congresses). Many of these events, for example, sought to make us rethink our current high consumption patterns and reflect on the collective stance regarding the irreversible damage caused to the environment. Thus, it is clear that such digital tools can and should be incorporated as effective and far-reaching pedagogical resources in environmental education practices.

The challenges of using digital technology for e-learning in higher education in times of Covid-19

Soon after the World Health Organization (WHO, 2020) confirmed community transmission of Covid-19 and declared it a pandemic, the Ministry of Education (MEC, 2020) gave up in-person classes in favor of classes mediated by digital technology (Ordinance No. 342/2020). It is up to all educational institutions, regardless of the levels, to adapt their education methodologies to remote and distance learning, since it maintains security indefinitely.

In this new scenario, platforms such as Moodle, Google Classroom, Microsoft Teams, and videoconferencing and communication systems such as YouTube™, Zoom, Google Meet, Skype, WhatsApp, and Telegram, among others, have become essential and part of the lives of teachers and students, being massively used as new pedagogical tools for teaching and communication (PINHEIRO-FILHO, 2020).

Technology went from being the villain of communication and distance between people to the great heroine and tool of approaching, socializing, and teaching (SANTOS-JUNIOR; MONTEIRO, 2020). It is important to emphasize that this fact did not occur without any bad climate, but certainly, humanity was an eyewitness to the individual efforts of educators who sought to adopt, maintain their teaching levels, give continuity to the educational process, prevent academic and school dropout, improve themselves, provide free services by disseminating their knowledge in lectures and events to the community and society, and fill the gaps left by the quarantine.

The models of education undergo daily transformations that seek the improvement of teaching. There are several alternatives and virtual platforms that have emerged and have been optimized to meet the needs of the imposed social distance. Many of these platforms started to be occupied by students from the most diverse academic levels, teachers, and others who sought through them to explore new territories, many of them unknown, to minimize the effects that would come as a consequence of the period away from the educational environment.

Reimers and Schleicher (2020), through the Global Education Innovation Initiative and the Director of Education and Skills, launched a study indicating the need for the development of educational tools that would provide effective teaching mechanisms during the period of social isolation. The study indicates that digital tools should undoubtedly be used as a means to make education and teaching continuous and that

educational managers should plan to improve the availability of materials that allow synchronous and asynchronous interaction between students and teachers.

Universities and other educational programs have sought articulated measures to ensure the continuity of professional and student qualification, through online classes, events such as courses and mini-courses, lectures, and symposiums, among others. In this context, digital technology has enabled the continuity of teaching, research, and extension activities, even at a distance. This, in turn, is understood as:

[...] educational modality in which students and teachers are separated, physically or temporally, and, therefore, it is necessary to use media and information and communication technology. This modality is regulated by specific legislation and can be implemented in basic education (youth, adult, and vocational education) and higher education (BRASIL, 2021, online).

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In other words, the applicability of these resources has become the best way to meet the teaching-learning processes, even in the face of spatial and temporal distance. Nevertheless, e-learning has also come to obey these pedagogical processes and has not ceased to be disseminated. This is a crucial theme in the process of citizen formation and makes us constantly reflect on our actions before the collective, as denoted by Loureiro (2019, p. 75-76):

[...] environmental education remains fruitful and is indispensable for transformative praxis at a time when we have reached impressive levels of concentration of wealth, destruction of ecosystems, extinction of species, material and immaterial expropriation of knowledge and cultures, violence against humans and non-humans, and spoliation of basic rights that enable our existence.

Loureiro (2019) thus refers people to reflect on the essence of e-learning beyond educational issues but also the concern for the collective, bringing to light other facets evidenced by the pandemic, such as social issues, equality, environmental awareness, and so many other factors basic to the human existence of.

METHOD

To achieve the objectives of the study presented here, the choice was for exploratory research with a methodological approach of qualitative research applied to videos posted on the virtual platform YouTube™. The research is under the ethical standards (<https://www.YouTube.com/yt/copyright/pt-BR/fair-use.html>.) and, because it does not involve any form of contact between the characters and others involved, it was not necessary to submit it to the ethics and research committee of this institution.

For Silva and Menezes (2005), exploratory research occurs through the survey of works from the most diverse sources to expand the researcher's knowledge. The concept can be better understood according to the description of Theodorson and Theodorson, (1970):

"Exploratory study. A preliminary study whose main purpose is to become familiar with a phenomenon that will be investigated so that the main study to follow can be designed with greater understanding and precision. The exploratory study (which may use any of a variety of techniques, usually with a small sample) allows the researcher to define his research problem and

formulate his hypothesis more precisely. It also allows him to choose the most appropriate techniques for his research and decide on the issues that most need emphasis and detailed investigation, and can alert him to potential difficulties, sensitivities, and areas of resistance." (Theodorson and Theodorson, 1970, p. 469, author's translation).

For Minayo (2019), qualitative research works with the universe of meanings, motives, aspirations, beliefs, values, and attitudes, which corresponds to a deeper space of relationships, processes, and phenomena that cannot be reduced to the operationalization of variables. Qualitative research is concerned, therefore, with aspects of reality that cannot be quantified, focusing on understanding and explaining the dynamics of social relations.

The study of the theme started with internet searches for keywords (environmental education, technologies, digital platforms, and pandemic) about the content, and later bibliographic and documental research. After this first moment, the contents were analyzed, being this method as the principle of organization and description of data and indicators (SILVA, 2007). This practice enables the organization of information through graphs or tables and facilitates the analysis and interpretation of results.

For the analysis of information regarding the use of digital technology for distance learning in Covid-19 times, the methods were discussing the importance of e-learning, especially in the current social and pandemic context, searching experiences in the uses of technology in other educational contexts, using, and analyzing virtual connections in educational institutions, especially in higher education.

Among the videos available on YouTube™ concerning e-learning, those selected for analysis addressed related content posted between February 1, 2020, and February 20, 2021, having more than 20 minutes and dealing with university-level content, being dismissed those with problems that prevented the completion of the table and replicated content. The search strategy used the tag environmental education typed in the search field of the platform. Then it was assigned filters available on the website itself such as date of upload – last year, type of publication – video, duration – long (more than 20 min), and results – classified by relevance.

At the end of the survey, it was obtained the information from 283 videos that were compiled and structured in an Excel spreadsheet. Each video was analyzed individually, and the following data were inventoried: title, theme, date uploaded, education and academic level and areas of activity of the speakers (through the Curriculum lattes platform), institutions promoting the event, the main themes of e-learning addressed and accessibility (if they had a description of the speakers and screen reader software for the blind ones, self-description, subtitles, and sign language, among others). When it was impossible to obtain these kinds of information, these items were categorized as other or unidentified.

The other elements of the research were extracted from websites and specialized platforms such as Google academic, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Coordination for the Improvement of Higher Education Personnel, CAPES) Periodicals, Scielo, Microsoft Academic, Sociedade Brasileira de Ciência do Solo (Brazilian Society of Soil Science, SBCS), Rede Brasileira de Educação Ambiental

(Brazilian Network of Environmental Education, REBEA), Moodle, and the MEC website, which provides data from Brazilian teaching universities regarding COVID-19.

RESULT AND DISCUSSION

The revolutionary use of YouTube™ for the dissemination of e-learning

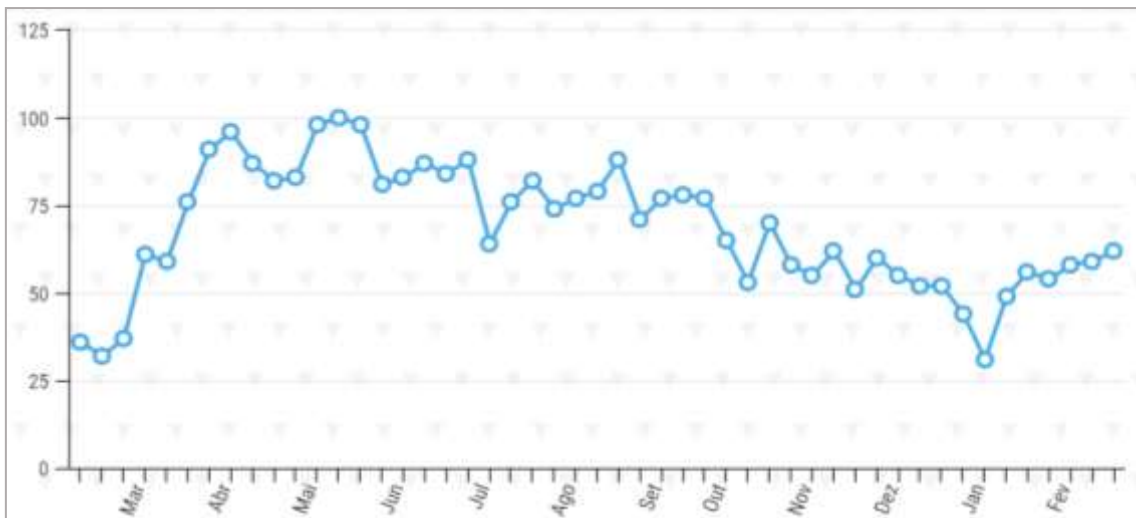
It is palpable how various tools have contributed to teaching-learning and how fundamental they are in this process. Still, YouTube™ remains the largest and most democratic free platform for sharing teaching and educational videos and for distributing audiovisual materials on the Internet, as highlighted by an article published in Video Viewers in September 2019. This study states that nine out of ten people who use this tool are looking for some kind of improvement and learning, being 87% to develop professional skills (MARINHO, 2018).

In a record way, this resource has been consumed by universities and other educational institutions to simultaneously hold conferences, webinars, and lectures, among other events, which can strengthen the themes that surround not only e-learning but education as a whole, remaining available for further consultation.

A survey conducted through the Google Trends platform with the term YouTube™ and Education makes clear the rise of this search especially after the pandemic was announced. Wojciki (2018) evidenced that the website has education as one of its greatest allies, which justifies the increase in search for these terms that reached peaks above 70% between the months of April to October 2020, reaching 100% in mid-May of the same year after the announcement of Covid-19 (Figure 01).

When comparing figures 1 and 2, it is possible to see that both show the greatest drops between the months of December 2020 and January 2021 and although each figure presents a specific research source with distinct intentions, the relationship among these data is the same and is directly correlated to the vacation and festive season and consequent decrease in academic activities and resulting in decreased demand for the subjects.

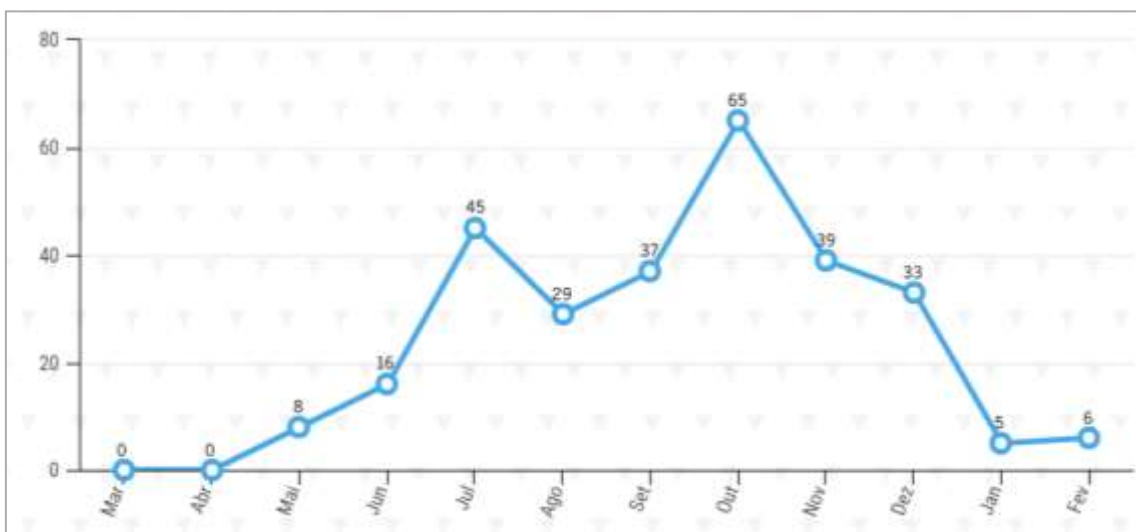
Figure 1 - Percentage of searches for the term YouTube™ Education over the past twelve months. From February 1, 2020, to February 20, 2021.



Source: Own (2021). Adapted from Google Trends (<https://trends.google.com.br/-trends/?geo=BR>).

In Figure 2, it is important to highlight some relevant points of the study. In the months of March and April, there were no events correlated to e-learning and, even before the month of February, there were no previous publications with the theme on the platform that was significant. These, in turn, presented themselves on the rise as of May, certainly correlated to the use of remote learning by higher education institutions. According to Carneiro et al. (2020), only 17% of educational institutions remained in operation soon after the beginning of the pandemic, and currently, more than 91% of institutions have joined remote classes (BRASIL, 2021), which certainly reflects the increasing number of accesses obtained in the results.

Figure 2 - Number of uploads of events released monthly with the theme Environmental Education on YouTube™. From February 1, 2020, to February 20, 2021.



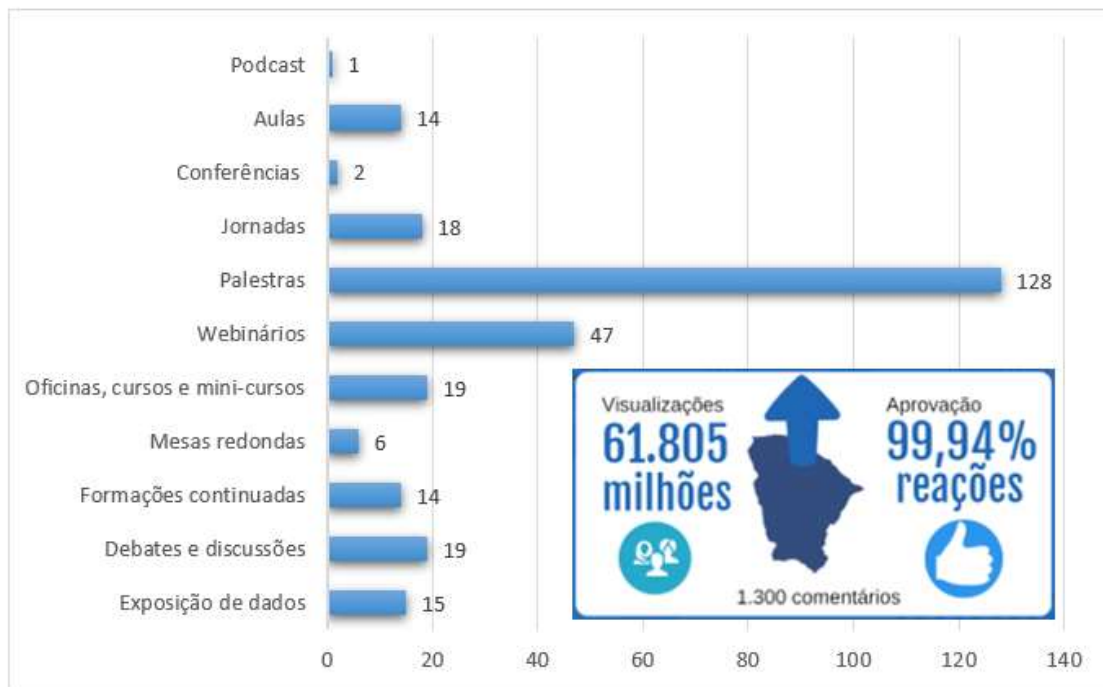
Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>).

The format of the presentations was distributed according to what was indicated by the speakers, most of them catering to lecture models 128 (45%), most of them being part of events, sometimes of large proportions (Fig. 3). Also in figure 3, the infographic highlights one of these events in question titled Digital Skills and Environmental Education, which had the highest rate of views with the theme in the period in question, reaching almost 62 million participants and 99.94% approval measured by the number of reactions and likes.

The event was promoted by the Education Secretary of Sobral and counted people distributed all over the country and even internationally, reaffirming the democratic power of the platform, such participants kept interacting through comments in which they specified their locations and areas of interest among others. An event of such magnitude was only possible given the methodology used and is just an example of the possibilities that, according to Almeida and Alves (2020) in their paper entitled Lives, Education and Covid-19: Strategies for interaction in the pandemic, at a time when many were lost and with their psychology shaken due to the closing of universities. Events like these brought the possibility of new learning scenarios during the pandemic.

Thus, if we do not weigh on the same scales the correlated problems, we can see how great this moment is. In positive terms, we can encompass the most distinct social classes through activities that are free of charge since many times certain students cannot participate given the logistics of the process, in addition to the diversity of events, experience, the flexibility of time, communication, and of course, breaking boundaries beyond knowledge when issuers from the most distinct backgrounds, institutions, and degrees of notoriety began to be present at events that would have been impossible in the past due to the logistics of time, travel, among others.

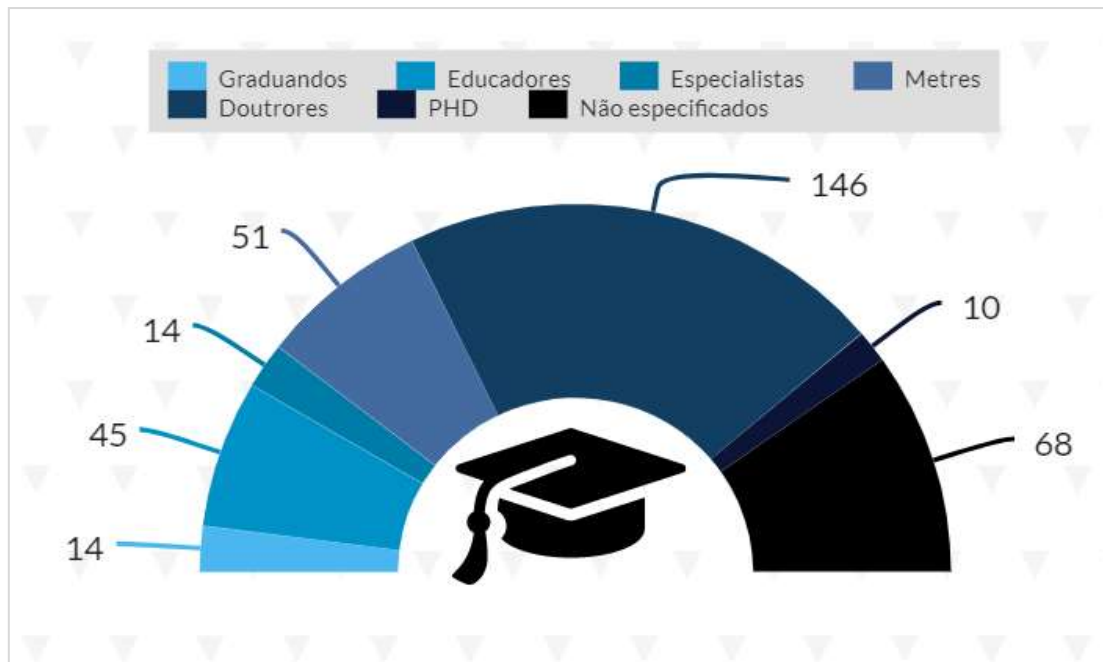
Figure 3 - Format of the presentations distributed according to the identification provided by the speakers and the called poster at the event. From February 1, 2020, to February 20, 2021.



Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>).

If one associates the above-mentioned statements with figure 4, which shows the degree of professional qualification of the speakers, it can be stated that almost 94% had some professional training, being mostly specialists, masters, doctors, and post-doctors (Ph.D.), respectively, probably linked to the dimensions of the events and academics. Undergraduates, when present, acted as mediators or student representatives in discussions, round tables, or professional experience reports correlated to the theme or project development. The unspecified category refers to those who, due to insufficient data regarding the name, and mention of academic training area, made it impossible to delineate them.

Figure 4 - Level of the academic background of web event organizers and speakers. From February 1st, 2020 to February 20th, 2021.



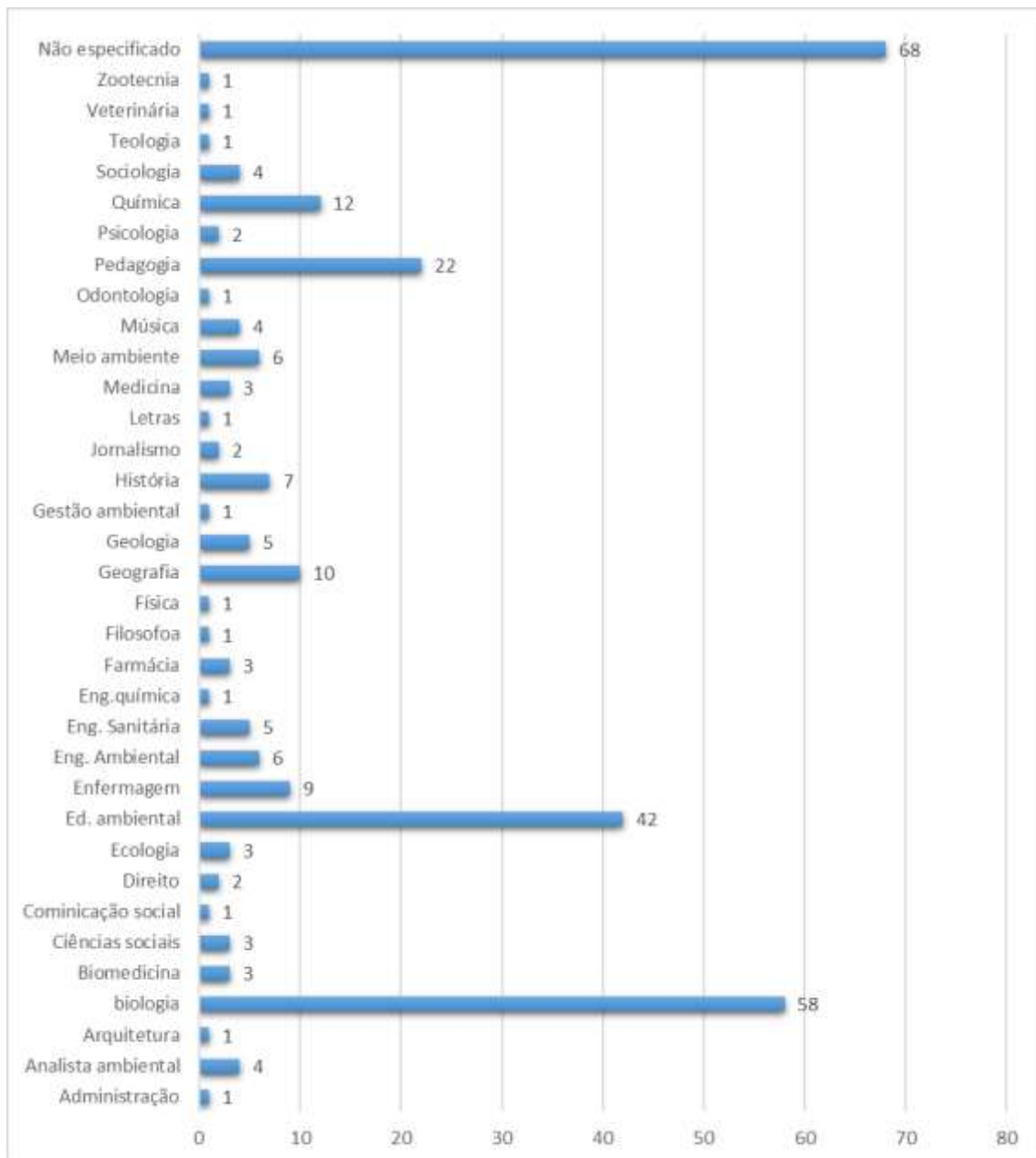
Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>).

Figure 5 highlights the presence of diverse backgrounds that at some point felt the need to embrace environmental education in their professions, certain of its importance and pluralism, ranging from biology and related areas to law, business, engineering, and many others. It is also worth noting that those professionals who were from areas such as health, medicine, psychology, and pedagogy generally addressed issues related to the outbreak of covid and the impacts caused to the environment and society.

Areas such as Geography and Chemistry were very significant, but biology, environmental education, and pedagogy were the courses that presented the largest number of professionals, not only in the area but also in the correlation of the themes addressed, as can be seen in Figure 6.

Figure 6 alludes to the main subjects associated with e-learning, with at least thirteen main areas plus the category others which includes issues such as Reserva Particular do Patrimônio Natural (Private Natural Heritage Reserve, RPPN), indigenous reservations, public policy, ecological connections, digital media, medicinal plants, anthropology, labor market, green food, among others.

Figure 5 - Area of activity and professional training of the organizers and speakers. From February 1st, 2020 to February 20th, 2021.



Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>).

Among the main themes within the e-learning that presented the greatest relevance is correlated to educational practices and citizen training, given its extreme importance and current situation. These practices presented pedagogical methodologies that enabled or prepared educators through techniques to pass content related to the theme and, thus, teachers set goals to pass the content to their students or even improve professionally as to practical changes in everyday life. For Pereira and Amaral (2020, p. 324), it is through

e-learning that educators will be better prepared for a post-Covid-19 world when their speech assumes the role of changes in political commitment to life through more ecological principles and by collective and solidary projects.

Other widely covered topics include conservation, biodiversity, biomes, and current events, many of which are cited by Pereira (2020):

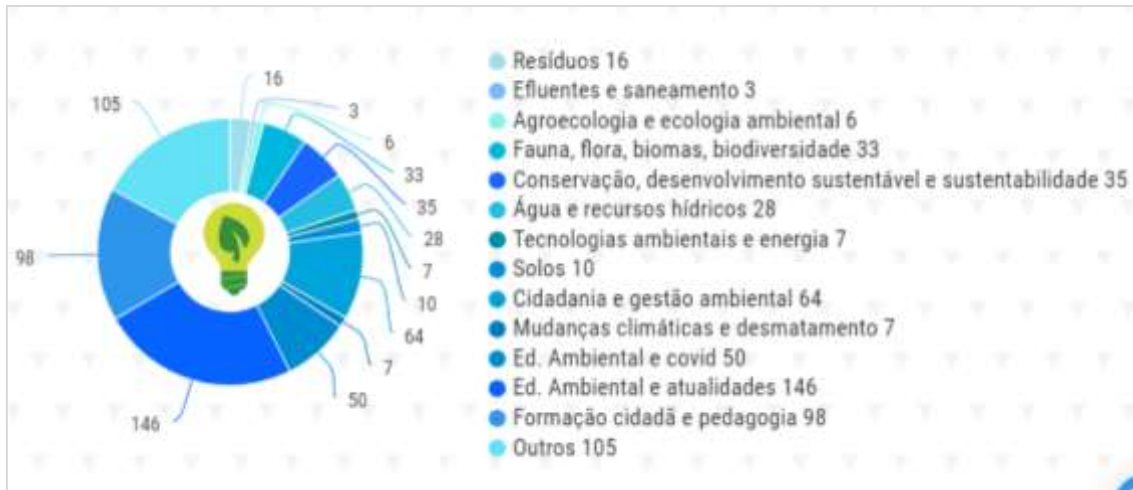
The disaster in Mariana, the earthquakes in Mexico, Tsunami in Japan. Later we had Hurricane Dorian, the powerful Cyclone Idai in Mozambique, a new disaster in Brumadinho, the greater liberation of the use of pesticides in Brazil, the incentive to exploit the indigenous lands, and the increase in the number of deaths in many regions, deforestation and the increase of forest fires in a large area in the Amazon. As if the fires in the Amazon were not enough, we were visited by the smoke from the fires in Australia, showing us that, just like earthquakes and other extreme events, in nature, everything is linked and the signs are appearing all over the planet. The most evident sign of these events is climate change and the lack of commitment of many governments on behalf of subservience to the development model of the predatory capitalist system (PEREIRA, 2020, p. 21256).

Notwithstanding what the author mentioned, the burning of more than three million hectares in the Pantanal according to data from Instituto Nacional de Pesquisa Espacial (National Institute for Space Research, INPE) and, of course, discussions related to the pandemic and the future environmental, human, and social perspectives of regarding the theme.

In Figure 7, there are two perspectives. The A describes the type of organizing institutions of the events that were distributed into four types, private universities may fit into the category of companies, institutions, and private actions, but for better visualization, it opted the separation of the same, in which it is clear that these, in turn, distribute much less their materials on the platform (11.3%). They should, therefore, be associated with the fact that private universities, besides having their platforms, are certainly of interest to sell their content.

As for public universities, ministries, and secretariats where there is a perspective of transparency and global dissemination, the works present a total of 45% of these publications, of which 32.2% are from public universities only. The concern with e-learning is of universal importance, therefore, goes beyond the dissemination of data to society permeating the power of awareness that this information has on it.

Figure 6 - Main themes addressed in the web videos as the main theme of environmental education, and as secondary themes, the other approaches. From February 1, 2020, to February 20, 2021.



Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>).

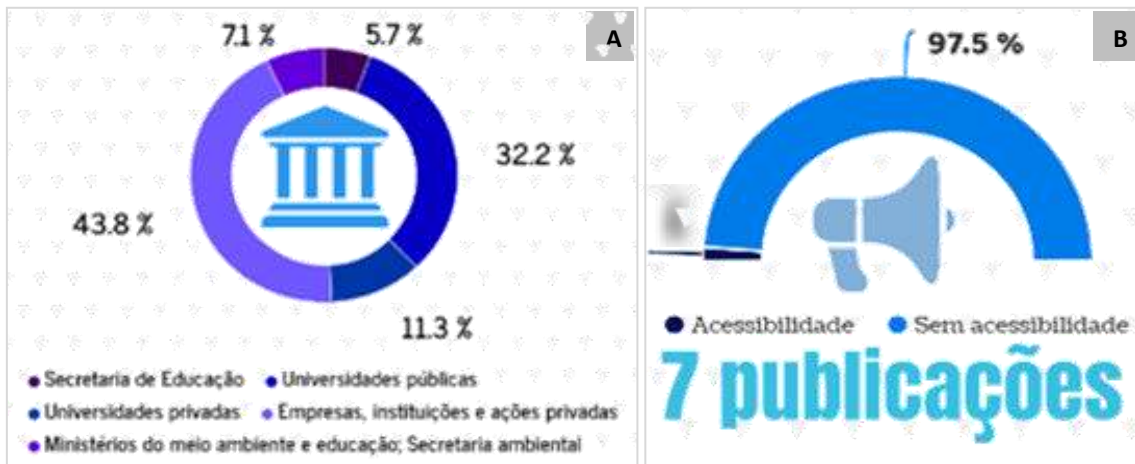
In addition, it is important to note that although the dissemination of content can be distributed for free, it does not mean that there is no financial return for these repositories since the very website YouTube™ part of a monetization system for their videos bringing return on the activities performed, which have a certain number of accesses, interaction, among others. It calls the attention and certainly justifies the growing interest of publication on the subject by platforms of companies, institutions, and private actions that once had very few publications on the subject and was taking a growing arrangement of data observed over the months to overcome the other actions performed by public organizations composing alone the highlight of almost 44% of publications on the subject which probably maintains a relationship information x profit since many of these companies seek to provide videos that both promote learning and financial return.

As we watch video by video and throughout the studies, we can see numerous difficulties presented by students, but one, in particular, brought us to think about accessibility. In the works and references used, as well as in the survey of content related to e-learning in this period, what we saw were numerous publications on social awareness, teacher training, and challenges of distance learning, among others that are related.

It is disappointing that although much is said about the collective, little thought was given to accessibility when in our survey only 5% of the videos (Figure 7B) presented some kind of tool to assist people with disabilities. Such results allow us to mention those demonstrated by the World Wide Web Consortium (W3C) when they stated that only 2% of Brazilian sites are accessible (WILLIAMS, R; BROWNLOW, 2020). It is worth remembering that IBGE data (2010) showed that practically 24% (45 million) of the Brazilian population has at least some disability investigated, this is very serious when we think about everything we have seen, the difficulties faced by students and society, to

find ourselves in front of institutions that should be prepared with such tools of teaching and inclusion, which become even more noticeable when it comes to digital accessibility.

Figure 7 - A. Educational institutions and quantity of uploads. From February 1, 2020, to February 20, 2021; B. Index of accessibility available in web videos for people with disabilities in the same period.



Source: Own (2021) data obtained from the YouTube™ platform (<https://www.youtube.com/>)

Such perception brings other discussions that for now do not fit in this study but serves as a reflection for the upcoming events and institutions that are in the process of adapting and bring along with other concerns tools that minimize these disparities, which are already so common in the daily lives of people with disabilities but that could have at this time greater chances of being seen as members of society and that also seek improvement and preparation about, not only this but other important issues for personal and social development.

FINAL CONSIDERATIONS

Through this study, it was possible to verify the importance of EE in times of Covid-19, as well as the use of digital technologies that mediate remote teaching during the isolation period. Above all, the confirmation of these methods was possible through the verification of searches on the subject of EE published on the YouTube™ platform, which, associated with other methodologies, is capable of making the process of remote teaching and learning as effective as face-to-face.

In this context, it was very important to realize how important YouTube™ is as an essential tool for formal education, since it has had an increase of information posted, as confirmed by our studies, and the collaborative and interactive power of this and other virtual educational tools is palpable.

As it is an extremely democratic platform, it is also up to those responsible for promoting events to pay special attention to the use of inclusion tools for people with disabilities, since this was the main negligence observed concerning accessibility, especially given

the social and human character, so emphasized in this pandemic period and the reflection through the collective look highlighted in the EE works.

The intention here is not to nullify the importance of classroom classes, but to glimpse the contributions of these instruments to promote the preservation and progress of the educational process of countless people who, worldwide, saw themselves lacking knowledge trainers who were interested in contributing to the intellectual and social development in face of the uncertainties faced by all of us.

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