



ISSN: 2230-9926

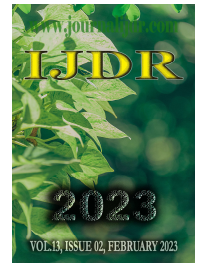
Available online at <http://www.journalijdr.com>

# IJDR

International Journal of Development Research

Vol. 13, Issue, 02, pp. 61822-61829, February, 2023

<https://doi.org/10.37118/ijdr.26357.02.2023>



RESEARCH ARTICLE

OPEN ACCESS

## TECHNOLOGICAL TOOLS FOR THE TEACHING OF PHYSICAL EDUCATION AT A DISTANCE

Hudson Sérgio de Souza\*<sup>1</sup>, Miguel Ángel Lira<sup>2</sup>, Sérgio Luiz Carlos Dos Santos<sup>3</sup>  
and Albert Batalla Flores<sup>4</sup>

<sup>1</sup>Bachelor Degree in Software Engineering - UniFatecie University Center - Paranavaí-Paraná-Brazil; <sup>2</sup>University of Barcelona; <sup>3</sup>Bachelor of Physical Education - UniFatecie University Center - Paranavaí-Paraná-Brazil; <sup>4</sup>Department of Applied Didactics - Faculty of Education - University of Barcelona

### ARTICLE INFO

#### Article History:

Received 11<sup>th</sup> January, 2023

Received in revised form

29<sup>th</sup> January, 2023

Accepted 18<sup>th</sup> February, 2023

Published online 28<sup>th</sup> February, 2023

#### KeyWords:

Teaching-Learning, TIC, Covid-19.

#### \*Corresponding author:

Hudson Sérgio de Souza,

### ABSTRACT

The teaching-learning process of the Physical Education career at the undergraduate level was drastically affected by the period of the Covid-19 pandemic, but it stood out for the performance of the teachers who sought the support of Information Technologies and Communication (TIC's) to continue the educational process with distance classes. The Novel Coronavirus (COVID-19) Pandemic abruptly affected the world population between 2020 and 2021, leaving a trail of respiratory injuries and mortality of approximately 14.9 million people worldwide, according to a survey by the Organization World Health Organization (OPAS, 2022). Faced with this new situation, public and private education faced three critical problems: institutional infrastructure, access to educational content, and the scarcity of technological resources. Most of the teachers were not used to manipulating the TICs to teach classes. On average, in one week they were already carrying out their first amateur transmissions of distance courses via the Internet, using the most diverse tools at their disposal. To measure the behavior of primary, secondary, and university teachers when they are forced to use TICs as tools to help in distance classes, a quantitative survey was conducted in four countries, namely Brazil, Argentina, Chile, and Spain, questioning voluntary participants about the use of TIC's in three moments of the pandemic period: before, during and after. As a result of the tabulation and statistical analysis of the data collected, the little or no use of the TIC before the pandemic stands out, and after the pandemic period, university professors had fewer problems in handling the TIC tools, however, all groups of teachers were unanimous in indicating that they will incorporate the use of TIC in their teaching-learning methodology and the search for new opportunities for socialization between academics, teachers and the community.

Copyright©2023, Samuel Cabanha and Aline Almeida Cabanha. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Hudson Sérgio de Souza, Miguel Ángel Lira, Sérgio Luiz Carlos Dos Santos and Albert Batalla Flores. 2023. "Technological tools for the teaching of physical education at a distance", *International Journal of Development Research*, 13, (02), 61822-61829.

## INTRODUCTION

The World Health Organization (WHO, 2020) issued a notification on March 11, 2020 to all countries through the decree entitled "coronavirus pandemic", which raised the contamination status to the Covid-19 Pandemic. This change in the classification is not related to the severity of the disease, but rather to its rapid geographical spread (Brasil-SNC, 2020). The Novel Coronavirus Pandemic, called Sars-CoV-2, which causes the disease Covid-19, which started in Hubei Province, People's Republic of China, is an acute and potentially serious respiratory infection, with a high transmission rate worldwide. (Brasil, 2021). Covid-19 is causing political, economic and social problems, and so far it is not possible to measure its proportion due to social distancing practices to reduce contagion caused by the virus (Oliveira; Souza, 2020).

**Theoretical Framework:** The practice of social distancing and wearing masks was successfully adopted against the Spanish flu pandemic in 1918, against the flu virus that killed more than 50

million people (Rogers, 2021). The world educational system at all levels of nursery, childhood, adolescence, and adult has suffered a paradigm rupture in the form of teaching-learning, caused by the adopted standards of social distancing to avoid crowds and infections of Covid-19, where teachers and students are isolated in their homes, being forced to adapt and deal in a very short time with Information and Communication Technologies (TIC) as a tool to help them educational. We have found three big problems in this new situation, which are: the institutional infrastructure and the pedagogical sector, the public or private educational institutions that were not prepared to offer, and the teachers and students not prepared without access and resources to TICs.

1. Institutional infrastructure and pedagogical sector: Before the world entered the period of the Covid-19 Pandemic, the term technological innovation was synonymous with investments with great financial contributions in large libraries and large computer labs full of computers, emphasizing that the factor of Internet speed, at the beginning of 4G technology, was not as relevant as it is today. At the pedagogical level, it was

sought to comply with the fifth item (Digital Culture) of the National Common Curricular Base (BNCC) of Brazil, for each particular course, the innovations were designed to bring technological elements to the classroom that optimize daily and manual activities;

2. Unprepared teachers: Most of the teachers were not in the habit of using technological resources outside the computer lab environment, where they had the help of a computer technician to deal with TIC during the execution of the proposed exercises. Except for computer science teachers and some TIC enthusiasts;
3. Students without access and resources to TIC: The lack of access to TIC equipment by students from disadvantaged economic classes who reside in remote locations with little or no source of access to technological resources, especially quality internet access to attend and interact with remote classes was a practically insurmountable barrier, even with palliative actions of insufficient TIC loans to this group of students, the technological infrastructure of the federal and private government does not cover the entire national territory, leaving coverage blind spots (Martins, 2020). There are reports that some students with physical disabilities were harmed by not being able to follow classes remotely and give feedback on their activities carried out at home, because the activities proposed to students were not adapted to allow universal access, satisfying the needs of the disabled (Sathler, 2020).

The highly mutant variant with the highest degree of infection, reinfection, and transmission, SARS-CoV-2 Omicron, was discovered in South Africa on November 24, 2021, with World Health Organization (WHO) reports in December 2021 of cases identified in 38 countries on 6 continents. The RT-PCR SARS-CoV-2 test has been used to diagnose this new Omicron variant. The unvaccinated population group is more prone to infection, having a more severe form of Covid-19, relative to the vaccinated population group presenting mild symptoms of the disease, in response to the mediated T cell. Omicron has changed the health protocols, where people infected with Covid-19 now have three isolation periods, being: five days of isolation for asymptomatic people, seven days for people with mild symptoms, and ten days of isolation for people with relevant symptoms. For severe cases of the disease, especially for people who have not been vaccinated, follow the protocol for hospitalization and intubation with a mechanical ventilator (Poude et al., 2022). According to the research carried out by Sathler (2020), in the last 25 years, several studies show that the development of Distance Education requires working together, cooperatively, through a multidisciplinary team made up of teachers, designers, developers, pedagogues, librarians, students, graduates, even external actors such as employers and governments. It is essential that there is prior training for teachers and other people involved in the drop-out process, as well as careful planning with the production of content made available to students, activities, evaluations, and organization in the form of a schedule that contains a learning itinerary, with mediation by the teachers in line with the pedagogical team, making the process more collaborative and not so focused only on exhibition classes (Sathler, 2020).

The Pandemic effect of the New Coronavirus Covid-19 that has been affecting the world since 2019, collapsed most of the Laws that govern the face-to-face and distance education system, and it is not possible to offer face-to-face education due to mandatory social distancing and the imminent contagion of the disease. This situation forced the reassessment of many educators and educational leaders, who still had prejudices about the methodology applied in distance learning, often based on personal and non-scientific interpretations on the subject. We must consider the academic opportunity presented in this paper since EAD contents are currently presented as a new teaching proposal and in times of pandemic it has been used successfully in many countries. However, we educators must take into account that any educational tool must contemplate the training of students and teachers, in our thinking, we believe that Education for

liberation must be contemplated in all educational acts. In the next section, we elucidate our theory of Education for Liberation based on important authors.

**Education for Liberation:** In the history of social development we find that civil society went through many changes from the industrial society to the information society (AYUSTE, FLECHA, LÓPEZ PALMA Y LLERAS, 2003). The advent of the industrial revolution changed social behaviors in the training of human resources that have left agricultural production for the industrial sector (DOS SANTOS, 2005).

In the words of Ayuste, Flecha, López Palma, and Lleras (2003, p.13-14) the information society has been fostered by:

...appearance of different techniques that allow information to be processed quickly. Microelectronics and information technology process and generate information; telecommunications transmit and exchange it; automation (robotics, office automation, industrial computing, etc.) programs instructions and messages, biotechnology and genetic engineering decipher codes of living matter to reprogram it; all innovations can be transformed into information codes that multiply the specific impact of each technology.

It is the information society concurring to make information faster. So, it remains to question education for the construction of citizenship, especially for those who do not have access to new technologies relevant to this new society. With this, a new type of exclusion has been generated: digital exclusion and education must be prepared to train citizens with the "capacity to handle information" as they have qualified it (AYUSTE, FLECHA, LÓPEZ PALMA Y LLERAS, 2003, p. 14). If there are excluded, critical pedagogy should be thought of in more detail, since it is she who will be in defense of these excluded. Also, a new curricular paradigm has to be proposed in schools so that students can adapt to the new technological demands of society. As we are in the information society and the historical movements of the non-authoritarian school that we have found in the bibliography: the "Yasnian Polaina School", by L. Tolstoy, in Russia; the schools of Hamburg in Germany; Summerhill, from Neill, in England and the theories of Carl Rogers' Therapeutic Psychology, will try to introduce pedagogical renovations in the school environment to provoke social changes through a democratic and assembly organization that respects the autonomy of individuals (AYUSTE, FLECHA, LOPEZ PALMA AND LLERAS, 2003). We also find that the cited pedagogical experiences have not been successful because the vision of the school was under the idealistic conception of the child, the optimistic vision of the role of the school as a motor of social change and construction of an ideal world, in the school, which it was totally different from social reality (AYUSTE, FLECHA, LÓPEZ PALMA Y LLERAS, 2003). Meanwhile, we found that this type of educational experience that dared to leave the traditional of its times and spaces have contributed numerous contents that are used by the participatory management of today's educational centers with great efficiency. These contents that Ayuste, Flecha, López Palma, and Lleras (2003, p.26) point out as:

Respect for the individual characteristics of the person, promoting self-esteem and personal autonomy, democratic organization, the participation of parents and students in the management of the center, the functioning of the assembly to decide collectively and by consensus on all issues related to school life.

Education for liberation constitutes a movement that, according to some researchers, including Giroux, Freire, Flecha, and Pérez Serrano, considers that combining the language of criticism with the language of possibility means continuing to fight to overcome determinism and immobility. developing critical thinking to promote transformative educational actions. Other authors consider that the Frankfurt School was the first critical theory. The name of the Frankfurt School is known as the philosophical trend also considered

neo-Marxist, represented by a group of German researchers found in the German city of the same name in 1929 by a group of philosophers, cultural critics, and social scientists. His main highlights were Horkheimer, Adorno, Marcuse, Fromm, and Habermas. His main product was the «Critical Theory of society». The Frankfurt School defined "Critical Theory" as a way of doing philosophy by integrating the formative aspects of philosophical reflection with the explanatory achievements of the social sciences. The last goal of his program is to unite theory and practice (DORIA, 2001), we must also consider the origin of Critical Pedagogy, which comes, as explained by Pérez Serrano (2000), with the Latin American current of qualitative research that It began in the 1960s, where Paulo Freire was one of the leading authors. In the 80s Apple (1997, p.17) criticized the economic crisis, a reflection of the neoliberal economic model adopted by then-President Reagan: "It affects our ideas about school, work and free time, sexual roles, 'legitimate' repression, political rights and participation". Likewise, Apple continues to reflect and quoted Castells (1980, p.3 in Apple 1997) who still pointed out the crisis that had come from the economic model:

Closed factories, empty offices, millions of unemployed people, hungry days, deteriorated cities, overcrowded hospitals, ailing administrations, explosions of violence, austerity ideologies, fatuous speeches, popular uprisings, new political strategies, hopes, fears, promises, threats, manipulation, mobilization, repression, surplus products on the market, militant workers unions, broken computers, nervous police, amazed economists, clever politicians, people who suffer; so many images that we had been told were gone forever, gone with the wind of post-industrial capitalism. And now they have returned again, blown by the wind of the capitalist crisis.

The coincidence with current Brazil is not an isolated fact, but the result of market economic policies that have led to these barbarities already mentioned in the year 1997, by Apple. This was written 26 years ago and it still corroborates the theory that economic power has taken over democracy and destroyed the welfare state, and has shaped education to serve it, not to train critical people capable of changing this unequal world. Apple (1997) advocated that the American State of the 1980s, in the midst of the neoliberal government of then President Reagan, was subjugated by the economic power that controlled it and made it intervene in the social process and in the "declassified" accompaniment. of people since the neoliberal system considered them only as economic agents. This, according to Apple (1997, p.45) had consequences through a dynamic interaction between the political and economic spheres, in education:

This implies a constant process of compromise, conflict, and active struggle to maintain hegemony. The results, moreover, are not a simple reflection of the interests of an economy or of the ruling classes. Even proposed reforms to change schools and what is taught in them is organized and controlled, and part of the process.

Other representatives of Critical Pedagogy, authors of the "Frankfurt School" which, despite having been characterized by its adherence to Marxism as the basis for all its reflections, also contributes values of enlightenment, reason, justice, and equality, inherited from philosophy. Kantian and Hegelian. Habermas (1989) proposed «communicative action» as being one of the new social theories to which Flecha et al. (2003, p.35) alluded: «that overcome the obsolete concepts of traditional modernity as the reaction against the perspectives of progressive change." Habermas (1989) has been one of the participants of the "Frankfurt School" with his "The Theory of Communicative Action" recovers the role of people above systems or structures, giving them the possibility of developing actions of change aimed at transforming society. The most significant representatives of the "Frankfurt School" converge in the analysis of capitalist society, in criticizing the predominance of instrumental reason (based on the functional relationship between means and ends) as an important element of the ideology of the 20th century and characteristic of

positivist science. Willis (1988, p.184) says that: "Ideology is, in itself, influenced by cultural production and, therefore, contains a modality and effectiveness within the cultural process." But, what ideology is the current one, and what culture is a referential parameter to build it, if even the application of the method of physics in the social sciences is used, as if the "object of study" were comparable, limiting the role of the researcher that of a technician busy finding quick and effective answers to the questions raised (AYUSTE, FLECHA, LÓPEZ PALMA Y LLERAS, 2003). The aforementioned authors, who defend Critical Pedagogy (Apple, Ayuste, Bernstein, Flecha, Freire, Giroux, Lleras, López Palma, and Willis) affirm in consensus that the need to establish a critical pedagogical dialogue is imminent to overcome the limitations of the technocratic discourse of education defended by the market economy, which insists on the need to train specialized labor for the world of work. The authors reason education as the process of dialogue in which all participants have a voice and vote and that it exceeds the limits of the classroom, extending to "contexts of social change actions" (AYUSTE, FLECHA, LÓPEZ PALMA Y LLERAS, 2003). Flecha (1997 and 2003) suggests that we must continue to be critical and propose exchanges that optimize education and our society. Pérez Gomez (1997, p.45) cites that "the school is a social institution in which the groups of individuals who live in larger social environments exert powerful socialization influences." The criticism that the author made about the behavior of the social environments where the school is inserted is a portrait of our thought about the lack of participation of the school in the formation of children with contents based on critical pedagogy because, as he said, Pérez Gomez (1997, p.46):

...the pragmatic ethic of anything goes, superficial tolerance understood as a lack of commitment and orientation, savage competition, egocentric individualism together with social conformism, the reign of appearances, fashions, having over being, the exaltation of the ephemeral and changing, the obsession with consumption, can be considered the logical consequences of a way of conceiving economic relations, which condition the lives of all human beings, regulated exclusively by the laws of the market. It is evident that all these aspects of contemporary, postmodern culture are present in daily exchanges outside and inside the school, undoubtedly causing the learning of certain behaviors, values, attitudes, and ideas.

Likewise, the author leads us to reflect that the school is a social conquest of the modern era, no longer only intended for clergymen and tonsured, as in the Middle Ages, and continues to clarify that the school of our days (in its operation and structure ) is adapted to the social, economic and political demands of these times. In the information society, the promotion of the consumption of new technologies, new mobile phones, and new computer systems is noticeable, which encourages the digital exclusion of many millions. If the school, especially the public one, does not provide this content, there will consequently be the computer exclusion of those who cannot access them. Education for liberation (Critical Pedagogy) constitutes a movement that has always fought for social demands and has criticized authoritarian positions, even though they were promoted by the left. Bernstein (1997) made an in-depth critique of authoritarian positions, values, rituals, and codes of conduct that have premises in the school that are biased in favor of a dominant group, also warning that "official knowledge" (Bernstein, 1997:11) is the academic knowledge built and distributed by the (dominant) State to educational institutions.

Our question is if the state that is the provider of "official knowledge" maintains economic policies within a market economy model, what will be the official knowledge that it will provide for educational institutions? Progressive and critical, surely it will not be. Therefore, our research on the use of EAD class tools during the Covid-19 pandemic has concerned us with proposing training in Education for Liberation. We think that the authors, who discuss Critical Pedagogy, reinforce the need for social changes to only become viable through culture and education, while they must be autonomous, and critical and not be subjugated to any tyrannical influence of the state that it is

at the service of a market economy model and that is favorable to economic growth to the detriment of social development. And that the students know that it is the democratic and assembly organization, which respects the autonomy of individuals, the definitive means to face the dungeons of the power of the market economy. In the current information society, it is found that the original design of Critical Pedagogy defended by Paulo Freire and others, as Comerzana (1997) comments, revived the "Pedagogy of Hope" to face the anxieties of the 21st century. Flecha (2003) describes the information society as being susceptible to criticism from many educators, who also criticize the current school model. However, they do not find recent content in the information society to support a new critical perspective for its aspects that need to be criticized. However, there are critical and effective social propositions to support these new proposals, although, nevertheless, in the educational field, the construction of knowledge is in a very embryonic state. This contribution by Flecha et al. (2003, p.37) well positions what we are looking for in this research, that is, the production of usable knowledge to benefit the excluded people who makeup society and thus try to contribute to changes in it; since people build societies so that the social organization benefits them as a collective, and not so that systems or states are created that are above them.

There is a consensus among renowned educators and authors: in a free world, where democracy is the system of government, there will always be possibilities to change society to improve the quality of life of its citizens, and the authors are unanimous in stating that these Changes will only be plausible to be carried out through education. And faced with this perspective of changes, we opted to endorse Education for Liberation, which is our way of understanding what underdeveloped countries need in these new times of Pandemics, the information society, and robotized Teaching. We choose education for freedom, thus trying to rebuild society in a way that is fairest for all. Imbermón (2002 p.5) asserted that "(...) it is possible to build a new education for a better world". Freire (2002 b) has given us an essay on the right and duty to change the world. There he contributes his knowledge that to transform the world, you have to dream, be utopian and have projects. Freire has also said that all these "dreams are projects to be fought for." Likewise, he added that the realization of these projects "is not easily achieved, without obstacles".

**TIC tools for distance teaching of Physical Education:** The multiple technological tools still unknown by teachers, as well as institutional bibliographic repositories, content management systems, real-time response systems, source management systems, and citation reviewers, among others (Secanell, 2020). Educational institutions have adopted video conferencing platforms for remote classes in an online format, such as: Zoom, Meet, Teams, Facebook, Instagram, Youtube, Hangouts, Skype, etc. As well as interaction tools, execution of exercises, and publication of results of exercises and searches, such as: electronic forms, Google Classroom, Microsoft Teams, and content created and stored in the cloud, among others (Secanell, 2020). The Zoom tool is a video conferencing platform developed by Zoom Video Communications, Inc. (Zoom, 2022), it aims to make video conferencing accessible and easy. The tool gained approximately 2 million new users in early 2020, during the Novel Coronavirus Covid-19 pandemic period according to growth analysis by Bernstein Research (Bernstein, 2022), the increase occurred due to increasing demand for solutions. Innovative solutions to satisfy home office work teams, work and remote classes, meetings, and online events through videoconferences with participant interaction (Novet, 2022). The basic and free plan of the tool provides access to 100 simultaneous users for a 40-minute video conference. The user gets a good experience with the Zoom tool, it is easy to dial, schedule, or join a meeting, there are well-highlighted buttons to activate or deactivate the microphone and camera, the automatic configuration of the tool produces high-quality audio and video, with settings personalized and intuitive. During the transmission, it is possible to share the screen, chat transcript, chat log, whiteboard, raise your hand, express reaction through emojis, appearance retouching function, and stage with wallpaper. Meetings can be recorded and stored on a physical disk or in clouds (Zoom, 2022).

The Google Meet tool is included in the current Google Workspace package from Google, Google, LLC (Google-a, 2022). During the Covid-19 novel coronavirus pandemic period, Google made the full suite of Meet tools available for free, including recording and hosting the video conference call of up to 100 participants to all Google users, without restrictions. The simplicity of handling the Meet tool is a strong point, scheduling or scheduling a meeting is a simple and quick task, and the schedule is shared on Google Calendar for the user who created the meeting schedule and with all the participants of this event. There is no need to install any additional applications to join a meeting via the Google Meet tool, just an Internet browser installed on your computer is enough to join a meeting. Another highlight of the tool is that the Meet tool does not limit meeting features for users who are not participating in the same domain as a particular host organization. However, there are features that are only available to organization members in the company domain, such as: recording meetings, adding or removing attendees, and muting all attendees. A point for improvement in the tool, which is the focus of criticism from several users, refers to the small number of participants that can be seen simultaneously in the screen display mosaic format (Google-a, 2022). Microsoft Teams software (Microsoft, 2022a) is an active collaboration tool with shared desktop space and is focused on group messaging and video conferencing associated with up to 250 participants. The Teams tool was developed instead of the Microsoft Skype for Business tool, derived from the Microsoft 365 package (Microsoft, 2002b). Teams have a web widget using the internet browser and another app that can be installed on a variety of devices like desktops, iPad, and smartphones, with versions for Windows, macOS, Linux, Android, and iOS operating systems. However, the design differences between the versions can confuse even the most experienced users of the tool. Another limitation of the tool is the small number of participants viewed simultaneously during a video conference, but Microsoft has been working to expand this number of participants concomitantly (Microsoft, 2022a). The Skype tool (Microsoft, 2022c) is one of the pioneers in video calls, which has persisted over time due to its updates and feature implementations. To hold a video conference using the version installed on the computer or smartphone, all participants need to have the tool installed on their device and have an active and connected Skype account, which would be a handicap in practicality. On the other hand, Skype can make a video call, even with low internet quality. Skype in its free version allows you to record video calls on your own computer, lasting up to one hour, with the participation of up to 50 guests, screen sharing, sending documents, soft frame, survey, and a question and answer session (Microsoft, 2022c). This tool stands out for being a pioneer in audio and video calls, as well as being intuitive and easy to install. Table 1 shows the main characteristics, advantages, and similarities found among the most used videoconferencing tools during the New Coronavirus Covid-19 Pandemic period.

**Online desktop productivity tools:** With the popularization of cloud computing by giant technology companies through their service packages with the focus on desktop productivity online, the Google Workspace package of the company Google, LLC (Google-a, 2022 ) and the Microsoft 365 package from the Microsoft company (Microsoft, 2002b), offer similar solutions for personal and professional use, safeguarding their peculiar differences inherent to each company.

**The packages:** Both packages consist of tools intended for the productivity of common and day-to-day personal or business tasks in the cloud, using Internet access, and the web browser on the computer or smartphone. Among the main activities carried out by the user, it is possible to cite: sending email, calendar, text document, electronic spreadsheet, slide presentations, videoconference, file, driver, file exchange, and access permission. The Google Workspace (Google-a, 2022), offers the possibility of using its resources offline, not requiring internet access to modify the files, being the future synchronization of the file when there is internet access. Microsoft 365 (Microsoft, 2002b) offers a range of desktop applications that must be installed on the computer and create files offline.

**Table 1. Comparison between videoconferencing tools for teaching/learning purposes**

TOOL	CAPACITY	PROMINENTE	CHAT	MEETING	COLLABORACIÓN
Zoom	-Basic and Pro Plans: 100 participants; -Corporate Plan: 300 to 500 participants;	-Dividir into groups of sessions; -Virtual blackboard; Quick access to the meeting; Virtual background image; -Flexibility of calls: individual, team, webinars, conference style.	-Function of a group or individual private chat.	-Transmission of video and voice in HD; -Complete Pantalla; -Active speaker; -Gallery view; Share screen; -Integration with desktop and mobile, conference room telephone system, dialing option.	-Sesiones separated from being in a meeting; -Reactions and characteristics of lifting the hand; Virtual framework.
Meet	-Google Workspace for up to 100 people for free; -Google Workspace Enterprise for up to 250 people; -Videoconferent recording; -Improved security control; -Custom storage.	-Available for the geographic google package; -Full integration with Google Workspace; -Live broadcast to 100,000 participants;	-Chat function available during video calls; -Virtual room integrated with Google Chat to facilitate videoconferentences; -Applications available for iOS and Android.	-Mode of presentation; -Share screen; -Leyenda en Vivo; -Noise cancellation; -Change from a general video meeting to a private video meeting with your predetermined equipment. -Applications available for iOS and Android.	-Integration with Google tools; -Integration with third-party tools; -The programming in Google Calendar can be performed by Bots (robots); -Design of video calls in mosaic format for up to 16 participants; -Integration with slides to make questions and answers live; -Show all windows.
Teams	-Live events: 10,000 participants	-Virtual background; -Web Application; -Desktop application; -Virtual frame; -Flexibility in the choice of events; -Programming of events; -Integration with Office applications.	-Chat available during the online meeting; -Ability to raise your hand; -Divisions by Teams and Channels, to maintain the organization of the participants; -Recording of meetings; -Transcription of the meetings.	-Schedule the meeting by the team; -Simple start of a meeting by opening a video call; -Share screen; -Gallery of images and videos; -Full screen; -Global dialing number; -Webinars; -Presentation; -Conferences.	-Guides make it easy to edit documents; -Greater integration with other Microsoft collaboration tools: SharePoint, OneNote, Word, Excel, and PowerPoint; -Integration with the Outlook calendar for meetings; -Integration with Whiteboard in video calls.
Skype	-Free version with video conference for up to 100 participants; -A paid version that provides Skype for Business video conferencing with up to 250 participants.	-One of the most popular videos conferencing tools in the world; -Shared workspace; -Participation of up to 6 participants per screen; -Security; -Integration with Outlook.	-Offers chat during the video conference; -Send files.	-Collaborative work area; -Control of the host; -Telephone via VoIP.	-Allows a collaborative workspace with the team; -Integration with Microsoft Outlook; -Protection against hacker attacks; -Low cost with VoIP telephony.

**Table 2. Comparison between the main web tools available in the Google Workspace packages from the Google company and the Microsoft 365 packages from the Microsoft company**

TOOL	GOOGLE WORKSPACE	MICROSOFT 365
Web packs	X	X
Offline Packages	X	
Applications Installed on computer		X
Choosing the most suitable Plan	X	
Complexity		X
Text Editor Resources	X	
Electronic Spreadsheet Resources		X
Compatibility	X	
Collaborative work	X	
Intuitive Tools	X	
Document Storage	X	

There were recent alterations in the nomenclatures of the packages of both companies, and the current Microsoft 365 package was named after Office 365, as well as the current Google Workspace package that was known as G Suite.

**Package plans:** Google traditionally offers four Google Workspace plans to cater to its target audience:

- Google Workspace Enterprise Startup;
- Google Workspace Enterprise Standard;

- Google Workspace Business Plus;
- Google Workspace Enterprise (Google-a, 2022).

Microsoft divides its Microsoft 365 package plans between home and business use categories.

- Microsoft 365 home package;
- Microsoft 365 Family;
- Microsoft 365 personal;
- Microsoft 365 Office Home;

- Microsoft 365 student (Microsoft, 2002b).

Microsoft 365 business package:

- Microsoft 365 Basic;
- Microsoft 365 standard;
- Microsoft 365 Premium;
- Microsoft 365 Apps (Microsoft, 2002b).

**Complexity:** Based on the desktop tool installed on a computer, the Microsoft Excel electronic spreadsheet has advanced resources for professional applications, when comparing the Microsoft Excel version (Microsoft, 2002b) for the Web with the Google spreadsheet version (Google- a, 2022) for the web, the supremacy of Microsoft over Google is observed due to the amounts and complexities of the resources available in the Microsoft Excel tool for the Web (Paul, 2022). However, when it comes to the desktop tool installed on the computer, the Microsoft Word text editor also has advanced resources for both personal and professional applications, comparing the web versions of Microsoft Word (Microsoft, 2002b) with the Google Documents (Google-a, 2022), the result of the analysis indicates that the Google tool is superior in resources, complexity, and accessories available to personal or professional users (Paul, 2022).

**Cloud storage space:** The Google Drive user has the storage space shared with their Gmail account, starting with 15Gb space for free accounts, 30Gb for Google Workspace Business Starter accounts, 2Tb for Google Workspace Business Standard accounts, and 5Tb for Google Workspace Business accounts. Plus, Google Workspace Enterprise accounts are already measured on demand (Google-a, 2022). In turn, the OneDrive for the Business user has a 1Tb storage space. Regardless of the type of account, the organization has 1Tb of storage, being added 10Gb per user in SharePoint (Microsoft, 2002b). Table 2 shows a comparison of the main functionalities and user preferences in relation to the web tools of the Google Workspace and Microsoft 365 packages. In general, users point to the agility and speed of Google tools, while some users do not stop using the specific and complex tools offered by Microsoft for some time. The learning curve pointed out by the users shows that the tools provided in the Microsoft 365 package (Microsoft, 2002b) are more complex, with a greater degree of integration difficulty and with non-intuitive collaboration resources. Subsequently, the available tools of Google Workspace (Google-a, 2022) are intuitive, and simple, with ease of integration and collaboration (Paul, 2022).

**Applicability:** In order for the teacher to be able to personalize quality attention to the students, orientation work must be carried out on the motivation of the students, creating a learning experience at the school, social, cultural, family, and scientific levels. Through technological innovation to solve pedagogical activities, applied by teachers in the classroom, it is possible to achieve success in academic stimulation (Rizales-Semprum, et al., 2019). The evolution of the educational software used together with the teaching-learning process of Physical Education, through a criterion to choose the type of interactive technology at a distance and the didactic strategy that will be used to help the learning of the academics (Rizales- Semprum, et al., 2019). Thus, this article aims to analyze how the New Coronavirus Pandemic (COVID-19) and the school restrictions and affectations that have been generated, may have influenced the (present and future) use of Information and Communication Technologies (ACT). by the teachers of the Physical Education (PE) course at different educational levels.

## MATERIALS AND METHODS

When necessary, and to overcome the problems derived from the lack of expected cases (<5), scores have been added (normally 1 and 2 in the case of responses with Likert scales of 5) or bands or groups have been eliminated (for example, the child level).

**Sample characteristics:** The sample was made up of 435 teachers and professors coming mainly from Brazil (44.6%), followed by Spain

(26.0%), Argentina (22.8%), and Chile (6.7%). Men accounted for 56.4% of the total number of participants who, mostly (70.9%) were under 50 years of age. Regarding the stage in which they taught, the university level stands out (41.9%) followed by Secondary, Primary, and Baccalaureate (29.7%, 15.2%, and 14% respectively); Due to difficulties when applying the statistics, the portion of the sample that practiced in childhood had to be eliminated. The distribution according to years of teaching experience was very uniform in the different age groups, the majority being between 11 and 20 years (25.3%) and the minority being over 30 years (12.6%). Finally, when they were asked about their specific training level in TIC, 75.9% stated that they were self-taught or had completed non-regulated or short-regulated programs, while 19.3% declared that they had no training and only 4.8% stated that they had completed a long regulated training. In all the following questions, the participants were asked to answer thinking about three moments: according to what was usual before the pandemic, during it, and according to what they expected in the future. Below we show the most important results grouped into two large areas: a) the attitude towards the use of TICs and their perceived competence in this area, and b) the details of the resources used.

## RESULTS AND ANALYSIS

**Attitude towards the use of TICs and perceived competence in this area:** When comparing what happened in the past with what happened during the pandemic and what is expected for the future, a very clear and widespread trend is detected in the sense of consolidating a positive attitude towards the use of TICs, a growing assessment perceived competence in this area and a willingness to continue using them for the foreseeable future. Regarding the attitude towards the use of TIC in PE, the percentage of responses in the lowest range (or less favorable to the use of TIC) goes from 16% before the pandemic to 3%-5% during and after it. For its part, the number of responses in the highest range (or most favorable to the use of TICs) goes from around 32% before the pandemic to values close to 50% during and after it. This trend is repeated when analyzing the evolution of perceived competition. Thus, the responses from the lowest range go from 27.8% before the pandemic to 5.5% during it and to 2.3% when asked about the forecast for the future. For their part, the responses in the high range grow from 22.5% before the confinement to almost 55% during it and 66% with regard to future expectations.

**Detailed use of TICs: What is used, when it is used, and what it is used for:** When asked about what resources were used before the pandemic, a fairly moderate but balanced use was detected among the different options, highlighting, at the top, the use of resources linked to the cloud and the use of social networks, with percentages of 36.1% and 29.0% respectively in the high range of use. On the contrary, the tools designed to encourage participation are those that denote a lower preference for use, with a percentage of 13.6% in the maximum use range. With the arrival of Covid, a general increase in the use of all TIC resources is very clearly detected, with the percentages in the low range decreasing and those in the high range increasing very significantly. The most used resources are the platforms (73.8% in the upper band) and the cloud (73.1% in the same band) while those with the least use are those linked to the promotion of participation (42.0% of responses in the upper band). Regarding the expectations of the use of TIC in the future, it is verified that the patterns of use of all the resources remain very stable except that of the platforms which decrease by 15.0%, a logical fact if we consider the return to sessions face-to-face. If the moment in which these resources were used is analyzed, a practically identical trend to that described in the previous point is maintained and shows a very clear increase in the use of TIC at all times (before the session, during the session, after the session and as an alternative to the session) if what was done before the pandemic is compared with what has been done during confinement. Clear signs of stabilization in the use of TIC are detected in the future, since, if it exists, the decrease in relation to the use during the pandemic is practically negligible.

Finally, practically identical to the two previous points, a clear trend of increase is detected in all the functions that is attributed to the use of TICs. This trend is maintained in future expectations, highlighting the reinforcement and motivation functions in which scores in the high range of more than 60% are obtained in both cases.

**Relationship between variables: contingency tables and x2:** The variables of nationality, gender, age, years of experience, level, previous knowledge, and attitude have been contrasted with the forecasts for the future in all areas. No differences worth noting are found in any variable except for nationality, where teachers in Brazil show a certain tendency to show higher levels of attitude, level of training, and, in general, expectations for the future in the use of TIC.

## CONCLUSION

Faced with the Covid-19 Pandemic, there was an imminent need to adapt to the historical moment experienced in pedagogical terms and with new information technologies. The difficulty of the Physical Education course was due to the practical characteristics of various disciplines and most of the teachers due to their familiarity with the technological tools presented. We need to rethink the dynamics of face-to-face classes in the post-pandemic, creating dynamic methodologies to add technological resources that were known during the Period of the New Coronavirus (Covid-19) Pandemic, to help motivate academics in the classroom so they can better develop their knowledge of the subject taught. Regarding the problems identified (Institutional infrastructure and pedagogical sector; Faculty in preparation; Students without access and resources to TIC) there are the following solutions. The use of TIC as a resource to help the teaching-learning methods of academics allows the application of active methodologies that help the transmission of knowledge in a more contemporary way, with fewer expository classes, since the focus should never be in the teacher and yes the student, who is more connected with the real profile of today's academic. Placing the student as the main actor in the learning process through an active learning function. It is necessary to completely restructure the planning of classes to contemplate the new teaching-learning methodologies, prioritizing the use of TIC as a means of transmitting knowledge, as well as a source of quality content and reliable research sources. It is worth mentioning that the dynamics of the classes will be changed, making them more collaborative, attractive, and applied to the practice of knowledge.

The use of the active methodology of the inverted class type fits perfectly into this new approach to lesson planning since it allows the teacher both to reduce the exposure time of the contents addressed, providing deeper discussions on the subject, and maximizing the practical application of the concept. A lesson inherited from the pandemic period is that teachers can use technological resources to help the two-way approach to the transmission of knowledge within the teaching-learning process. The adoption of innovative technologies to implement the educational process brings benefits and productivity gains for everyone involved, both teachers and students can plan more dynamic, attractive, and practical classes, through the use of cloud resources, simulators, collaborative documents, additional video lessons that address specific details on the subject, as well as a wide repository of content similar to that used in class, being applied as support material. Gamification is a type of technological innovation that seeks the practical experience of the academic experiencing the daily issues of the physical education professional. It can be addressed from theoretical issues with the behavior and functioning of the human anatomy to more complex issues such as simulating a variety of possible results by altering procedures for the execution of a certain activity, seeking the peak of use. of physical activity, balancing the result with the minimum of physical stress and possible injuries that may arise during the daily training battery in the search for the best performance. The adoption of extension practices involving teachers with the role of tutors and students with the role of executors of actions in favor of the community is a form of direct contact between the academic who puts into practice all his acquired

knowledge and the citizen who seeks specialized assistance. low or no cost. As a result of this extension practice, the academic is inserted into the scientific universe by the professor, now in the role of guiding scientific initiation at the undergraduate level, through the production of scientific articles that will be published in scientific journals, exposed to through banners or in the form of conferences at scientific initiation events. These actions enriched the curricular content of the academic and will awaken him to the search for new results through the scientific research of other authors with practices and results similar to his own. Through the experience of practical extension work with the community, as well as effective participation in scientific initiation at the undergraduate level and the help of technological resources used in education, it is possible to bring practical examples of daily experience. a day of the physical education professional in the classroom, as well as the recording of specific video lessons on the resolution of physical exercises, applied in the classroom. Undoubtedly, the application of technological resources helps not only in the teaching-learning practice of physical education in places far from big cities but also promotes socialization between academics, teachers, and the community as a whole.

## REFERENCES

- ALMEIDA, Evania Guedes de; LEITE, Kadygyda Lamara de França; FERREIRA, Lucas de Sousa; FARIAS, Mariana Soares de. Ensino remoto e tecnologia: uma nova postura docente na educação pós-pandemia. VII Congresso Nacional de Educação CONEDU. ISSN: 2358-8829. p.1-10, 15-17 out. 2020.
- ALMEIDA, Veronica Elói de. Precisamos falar sobre educação a distância na pandemia. *Revista Carioca de Ciência, Tecnologia e Educação RECITE*. E-ISSN 2596-058X. Rio de Janeiro-RJ. v.5, n.especial. 2020.
- BERNSTEIN, Research. Zoom has added more videoconferencing users this year than in all of 2019 thanks to coronavirus, Bernstein says. New York-USA. Disponível em: <<https://www.bernsteinresearch.com/>>. Acesso em: 1 mar. 2022.
- BRASIL. Governo Federal. Ministério da Saúde. Coronavírus. O que é a Covid-19? 08 abr. 2021. Disponível em: <<https://www.gov.br/saude/pt-br/coronavirus/o-que-e-o-coronavirus>>. Acesso em: 25 abr. 2021.
- CORRÊA, Francinete Massulo; MIRANDA, Elisangela Matias. Horizon report colaborando com a gestão do desenvolvimento da ead na sociedade do conhecimento. Simpósio Internacional de Educação a Distância SIED. 15-26 set. 2020.
- ESCOBOSA, G.; LLEIXÀ, T.; CORAL, J. Diseño del prototipo de una web-App de Educación Física en Content and Language Integrated Learning (CLIL). *Journal of Sport and Health Research*. v.11, Supl.1, p.1-16, 2019.
- GOOGLE, LLC. Google Workspace. Google Docs. Disponível em: <<https://www.google.com/docs/about>>. Acesso em: 22 mar. 2022c.
- GOOGLE, LLC. Google Workspace. Google Drive. Disponível em: <[https://www.google.com/intl/pt-BR\\_ALL/drive](https://www.google.com/intl/pt-BR_ALL/drive)>. Acesso em: 22 mar. 2022b.
- GOOGLE, LLC. Google Workspace. Google Forms. Disponível em: <<https://www.google.com/forms/about>>. Acesso em: 22 mar. 2022d.
- GOOGLE, LLC. Google Workspace. Google Meet. Disponível em: <<https://meet.google.com>>. Acesso em: 5 mar. 2022a.
- HERNANDO, Meritxell Monguillot. Diseño, implementación y evaluación de situaciones de aprendizaje mediadas por TIC en educación física a través de la colaboración docente. Tesis Doctoral (Universitat Oberta de Catalunya). Barcelona, 2017.
- KENSKI, Vani Moreira. Tecnologia e ensino presencial e a distância. Campinas-SP: Papyrus, 2015. [Pearson]. Disponível em: <<https://plataforma.bvirtual.com.br/Leitor/Publicacao/2264/pdf/0?code=TEvGpgh2gTntGPeQ1BJha8yzBxhKRxCqh6HIIJTzL0i8ZT6YfDltgKQKNfykS8W2yjAYhGa3vPi7GKA16uldIw==>>. Acesso em: 3 nov. 2020.
- LEAL, Paulo Célio de Souza. A educação diante de um novo paradigma: Ensino a distância (EAD) veio para ficar! Gestão &

- Tecnologia Faculdade Delta. ISSN 2176-2449. a.9, v.1, ed.30, jan./jun. 2020.
- LIBERALI, Fernanda Coelho; FUGA, Valdete Pereira; DIEGUES, Ulysses Camargo Corrêa; CARVALHO, Márcia Pereira de. Educação em tempos de pandemia: Brincando com um mundo possível. ISBN: 978-65-5637-014-9. Campinas-SP: Pontes, 2020.
- MARTINS, Ronei Ximenes. A Covid-19 e o fim da educação a distância: Um ensaio. Revista de Educação a Distância EmRede. ISSN 2359-6082. v.7, n.1, 12 mai. 2020.
- MICROSOFT. Microsoft 365. Disponível em: <<https://www.microsoft.com/pt-br/microsoft-365>>. Acesso em: 5 mai. 2022b.
- MICROSOFT. Microsoft 365. Skype for Business. Disponível em: <<https://support.microsoft.com/pt-BR/skype-for-business>>. Acesso em: 5 mar. 2022a.
- MICROSOFT. Microsoft 365. Skype. Disponível em: <<https://www.skype.com/pt-br>>. Acesso em: 15 mar. 2022c.
- MILL, Daniel. Análise da educação a distância como interseção entre a formação docente, as tecnologias digitais e a pós-graduação. Educação em Perspectiva. Viçosa-MG, v.4, n.2, p.343-69, jul./dez. 2013.
- MOODLE, TM. The Moodle Project. Moodle 3.11. Disponível em: <<https://moodle.org/>>. Acesso em: 22 mar. 2022.
- MOTA, Ana Paula Ferreira. A educação a distância (EaD) e os novos caminhos da educação após a pandemia ocasionada pela Covid-19. *Brazilian Journal of Development*. DOI:10.34117/bjdv6n7-799. ISSN 2525-8761. Curitiba-PR, v.6, n.7, p.52860-867, jul. 2020.
- NOVET, Jordan. CNBC. Zoom has added more video conferencing users this year than in all of 2019 thanks to coronavirus, Bernstein says. February 26, 2020. Disponível em: <<https://www.cnbc.com/2020/02/26/zoom-has-added-more-users-so-far-this-year-than-in-2019-bernstein.html>>. Acesso em: 1 mar. 2022.
- OLIVEIRA, Hudson do Vale de; SOUZA, Francimeire Sales de. Do conteúdo programático ao sistema de avaliação: Reflexões educacionais em tempos de pandemia (COVID-19). Boletim de Conjunturas (BOCA). Boa Vista-RR. a.2, v.2, n.5. 2020.
- OPAS, Organização Pan-Americana da Saúde. Excesso de mortalidade associado à pandemia de COVID-19 foi de 14,9 milhões em 2020 e 2021. 5 mai. 2022. Disponível em: <<https://www.paho.org/pt/noticias/5-5-2022-excesso-mortalidade-associado-pandemia-covid-19-foi-149-milhoes-em-2020-e-2021>>. Acesso em: 19 nov. 2022.
- POUDE, Suján; ISHAK, Angela; PEREZ-FERNANDEZ, Javier; GARCIA, Efrain; LEÓN-FIGUEROA, Darwin A.; ROMANÍ, Luccio; BONILLA-ALDANA, D. Katterine; RODRIGUEZ-MORALES, Alfonso J. Highly mutated SARS-CoV-2 Omicron variant sparks significant concern among global experts – What is known so far? Elsevier Direct. Travel Medicine and Infectious Disease. ISSN 1477-8939. v.45, jan./fev. 2022.
- RIZALES-SEMPRUMA, Mervin Javier; GÓMEZ-VALDERRAMAB, Carlos Luis; HERNÁNDEZ-SUAREZC, Cesar Augusto. Uso de herramientas tecnológicas para la enseñanza de la ciencias en educación media diversificada de acuerdo a la modalidad de estudio a distancia. Eco Matemático. ISSN: 1794-8231. v.10, n.2, p.35-46, jul.-dic. 2019.
- ROGERS, Kristen. CNN Brasil. Saúde. O que a pandemia da gripe espanhola de 1918 pode nos ensinar sobre a Covid-19. 26 set. 2020. Disponível em: <<https://www.cnnbrasil.com.br/saude/2020/09/26/o-que-a-pandemia-de-gripe-espanhola-de-1918-pode-nos-ensinar-sobre-a-covid-19>>. Acesso em: 25 abr. 2021.
- SAIBERT, Kethlyn. Uninter Notícias. Tendências tecnológicas pré e pós pandemia. 18 mai. 2020. Disponível em: <<https://www.uninter.com/noticias/tendencias-tecnologicas-pre-e-pos-pandemia>>. Acesso em: 06 mar. 2022.
- SALDANHA, Luis Cláudio Dallier. O discurso do ensino remoto durante a pandemia de COVID-19. Revista Educação e Cultura Contemporânea. Rio de Janeiro-RJ. ISSN-Online: 2238-1279. v.17, n.20, p.124-44, 2020.
- SANTANA, Pablo. InforMoney. Trabalho remoto. Em meio à pandemia de coronavírus, setor de comunicação digital cresce exponencialmente. Disponível em: <<https://www.infomoney.com.br/negocios/em-meio-a-pandemia-de-coronavirus-empresas-de-tecnologia-de-trabalho-remoto-colhem-bons-frutos/>>. Acesso em: 1 mar. 2022.
- SANTOS, Vanide Alves dos; DANTAS, Vagner Ramos; GONÇALVES, Anna Beatriz Vieira; HOLANDA, Beatriz Meireles Waked de; BARBOSA, Adriana de Andrade Gaião e. O uso das ferramentas digitais no ensino remoto acadêmico: Desafios e oportunidades na perspectiva docente. VII Congresso Nacional de Educação CONEDU. ISSN: 2358-8829. p.1-10, 15-17 out. 2020.
- SATHLER, Luciano. Jornal O Povo. Emprego e Carreira. Covid-19: Educação pós-pandemia e a urgência da transformação digital. 30 abr. 2020. Disponível em: <<https://empregosecarreiras.opovo.com.br/opiniao/educacao-pos-pandemia-e-a-urgencia-da-transformacao-digital>>. Acesso em: 27 mar. 2022.
- SECANELL, Irene López. Análisis del uso de herramientas digitales en educación física antes y durante la Covid-19. Unidad de Educación. Florida Universitaria, Catarroja, Valencia, España. Revista Española de Educación Física y Deportes-REEFD. ISSN: 1133-6366. ISSN: 2387-161X. n.431, a.LXXII, 2020.
- SÉRIE EDUCAR. Volume 40. Prática docente. ISBN:978-65-86127-71-3. Belo Horizonte-MG: Poisson, 2020. 201p.
- SILVA, Josué de Paulo Bailo da; LEITE FILHO, Dionisio Machado. Softwares educacionais e suas aplicações em tempos de pandemia: estudo sobre possibilidades de aplicação. *Brazilian Journal of Development*. ISSN 2525-8761. Curitiba-PR. v.6, n.7, p.50866-878, 24 jul. 2020.
- SILVA, Siony da. Tecnologias de informação e comunicação e a EaD. Revista Sinergia CEFETSP. v.5, p.48-51, 2020.
- SILVA; Marco Antonio Gomes Teixeira da; CARDOSO, Sergio Luis. A Abordagem da Pesquisa Científica Envolvendo os Temas Emergentes no Cenário EaD e Formação Continuada. Revista Brasileira de Aprendizagem Aberta e a Distância. I:e344; p.1-17; 2019.
- ZOOM, Video Communications. Zoom meetings. Disponível em: <<https://zoom.us/>>. Acesso em: 1 mar. 2022.

\*\*\*\*\*