

THE EVOLUTION OF COMMUNICATION AND INFORMATION TECHNOLOGIES IN EDUCATION



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**Hélio Pena de Faria Júnior¹, Cristiana Barcelos da Silva², Fábio Machado de Oliveira³
and Marcus Vinicius Sandoval Paixão⁴**

ABSTRACT

The present work aims to describe, from an analysis of what is in the literature on the introduction and evolution of communication and information technologies in education (ICT), thus building a historical record of these technologies. The project is justified by the relevance of the theme and the importance that ICT represented in the pandemic period, practically saving education from two years of social isolation, leaving millions of students out of school, enabling, even with some difficulties encountered by teachers and students, the continuity of pedagogical activities, minimizing the educational losses of a period never seen in the history of education, it is clear that these ICTs should be incorporated into the pedagogical projects of the courses, since Ifes has a Moodle academic environment (Dynamic Modular Object-oriented Learning Environment) available that enables pedagogical activities for teachers and students. In the face of so many digital technological innovations that have emerged in recent times, it is possible to verify that digital communication and information technologies have become a fertile field for technology companies, developers, researchers in the field of technologies and education, since they have seen technologies as a tool capable of providing a transformation of teaching-learning methods and practices that are important for the achievement of pedagogical objectives, thus not diminishing the role of educators, or even replacing it, but allowing some tasks and functions to be expanded and diversified, and it should also be noted that TDCI contemplates other sectors, becoming multidimensional with roots spread throughout society. The legislation that governs the introduction and use of technological equipment in the classroom has advanced and stimulated its use in everyday school activities.

¹Dr. of Education

Federal Institute of Education, Science and Technology of Espírito Santo

Email: heliopfj@ifes.edu.br

Orcid: <https://orcid.org/0000-0002-2910-4431>

²Dr. in Cognition and Language

State University of Norte Fluminense "Darcy Ribeiro"

E-mail: cristianabarcelos@gmail.com

Orcid: <https://orcid.org/000-0003-3262-9404>

³Dr. in Cognition and Language

State University of Norte Fluminense "Darcy Ribeiro"

Email: fabiomac@gmail.com

Orcid: <https://orcid.org/0000-0003-1336-2994>

⁴Dr. in Plant Production, Dr. in Education

Federal Institute of Education, Science and Technology of Espírito Santo

Email: mvspaixao@gmail.com

Orcid: <https://orcid.org/000-0003-3262-9404>

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INTRODUCTION

Technologies have always been part of the life of human beings, this statement also extends to educational institutions throughout the country, as they have always been an important didactic ally for teachers in the performance of their daily activities, whether through the simple blackboard, chalk, books, handouts, machines, tractors and implements in technical schools.

Cysneiros (2000) Conceptualizes technologies used in education as simple objects such as paper and ink, pencil and pen, brush, books and notebooks, knives and scissors; also complex objects such as telephones, video and television sets, calculators and computers.

It was around the 60s that new technological equipment produced by the industrial society was introduced in Brazilian classrooms, overhead projectors, slide projectors, mimeographs, which were classified as independent technology.

From this decade on, the creative process of industry and society gave rise to digital communication and information technologies that promoted a great revolution in interpersonal relationships with the introduction of computers, internet, cell phones, are some examples of this creativity, which made its adoption immediate in schools, promoting a revolution in didactic-pedagogical relationships, facilitating the teacher-student dialogue. Everyone wanted to acquire a notebook with internet access, not to mention that the cell phone today is the biggest star of technologies.

In the face of so many novelties that have emerged in recent times, it is possible to verify that digital communication and information technologies have become a fertile field for technology companies, software developers, researchers in the field of technologies and education, since they have seen technologies as a tool capable of providing a transformation of important teaching-learning methods and practices for the achievement of pedagogical objectives, thus not reducing the role of educators, nor even replacing it, but allowing some tasks and functions to be expanded and diversified, and it should also be noted that TDCI contemplates other sectors, becoming multidimensional with roots spread throughout society.

We cannot fail to mention the advancement of legislation that deals with the introduction and participation of TDCI in the educational process has had a relative advance in recent decades, allowing the inclusion of a considerable percentage of the workload developed through technologies in the pedagogical political projects of the

courses in educational institutions in general, in addition to dealing with the introduction of technological equipment in the classroom, such as cell phone.

In the Covid 19 pandemic, there was a need to isolate people and immediately adapt to the use of Digital Communication and Information Technologies (TDCIs) in an integral way, promoting a true metamorphosis in the didactic procedures so that there was continuity in the pedagogical activities of the courses, and making the schedule of academic activities flexible for isolated students and for those who were forced to work due to the decrease in income on the part of the of families, thus preventing a deep problem in education, which is school dropout.

From their homes, the teachers did what was in their power, often working in an improvised way, in an uncomfortable environment, with interference of various natures, from neighbors' works to noise coming from the street, using their own equipment and connections, using digital communication and information technologies in which they had more knowledge.

In the expectation of visualizing a different time at the end of the pandemic, a new posture in pedagogical and didactic performance should be present, giving rise to concerns and uncertainties in the direction of the use of digital communication and information technologies in educational institutions across the country, since teachers will be in schools and classrooms.

An updated theoretical reference leads us to believe in the relevance of the theme due to its multi and transdisciplinary character and possibility, since it permeates various types of knowledge of scientific knowledge.

It also presents a tireless search for the path taken by the researcher in the incessant struggle to witness a real democratization of education with equal opportunities for all,

The research was carried out with the objective of describing the introduction and evolution of communication and information technologies in education, as well as exposing the advancement of legislation in allowing and encouraging the introduction and use of digital equipment in the classroom.

METHODOLOGY

To develop this article, the researcher used articles found on digital platforms and also textbooks existing in the library of the Federal Institute of Education, Sciences and

Technologies of Espírito Santo, Campus Santa Teresa-es, which deal with the history of the use of communication and information technologies in education from their introduction and development to Digital Communication and Information Technologies (TDCI), as well as his knowledge of 31 years of teaching activities.

The method of evaluation procedure used for the present study was a bibliographic and documentary analysis of the general study plan, its logical assumptions, and the chosen reasoning process.

To carry out the study, in addition to the method of bibliographic analysis in textbooks and research on websites specialized in scientific articles on the subject, it was necessary to opt for a method of procedures, which has a more specific character with a presentation of all the evolution of communication and analog information technologies up to the present day with the introduction of digital technologies, involving the most concrete stages of the investigation, with restricted purposes in terms of general explanation of the technologies studied.

The research in question had as its chosen procedure a non-experimental design, as no variables were manipulated, it is of the descriptive and bibliographic type, carried out from January 2023 to December 2023.

RESULTS AND DISCUSSION

Since its foundation, existing educational technologies have been present in the teaching-learning process of the courses taught by this octogenarian institution, whether in the form of agricultural machinery and implements or a simple alcohol mimeograph for the reproduction of teaching materials to support the disciplines and teachings passed on by teachers to students, reproduction of texts or evaluations given, requiring almost artistic skills and creativity from teachers for a good preparation of classes.

Every resource or material used in the classroom by the teacher, ranging from simple chalk, blackboard, printed texts to current technological equipment (FISCARELLI, 2007).

Time has passed and the technologies available for education have evolved as follows:

Limestone chalk – It is not known for sure when it appeared, but it was found in cave paintings from 40,000 B.C. It is made of a mixture of plaster and limestone, it is the most used communication technology in schools to this day (ENSINARHISTÓRIA, 2022)

Blackboard - The first tool used to present the classes to the students was the well-known blackboard. In fact, teachers have used blackboards for hundreds of years to teach many generations of students (VELARDE, 2023)

Alcohol or ink mimeograph - It is an industrial equipment invented by Thomas Edson in 1887 and introduced in schools in the 70s and 80s, it was desired by all teachers in the classroom, it became famous for making life easier for teachers, intended to reproduce tests or small texts that had to be previously written on a stencil that had a carbon on the surface (OLHARDIGITAL, 2022), its main characteristic was the smell of alcohol left on the printed sheets,

Flannelgraph - Non-industrialized equipment characterized by a wooden tripod that supported a wooden plate also lined with a flannel fabric where they were affixed with a steel sponge glued to the figure, texts, and other illustrations to be shown by the teacher to the students, didactic material extremely useful at any level of education and also in lecture, short courses and presentations in general (CPT, 2015). Its great advantage is that it is a simple, low-cost equipment, avoiding equipment or electricity for its use.

Serial Album - Auxiliary didactic resource in classes that consisted of several cardboard-type sheets in a predetermined sequence where the teacher prepared in advance the lessons and didactic demonstrations (LOPES, 2017) of subjects pertinent to the subjects to be shown to the students. It is a feature with a very affordable price.

Textbook - Introduced from 1920 onwards, the textbook is an important educational didactic instrument in helping to conduct pedagogical activities and in the process of development and monitoring of disciplines by the student (INTERSABERES, 2021), published by publishers in an appropriate language and containing the most varied themes of the disciplines taught.

Overhead projectors - Around the 1930s, the use of overhead projectors began in the United States, industrialized equipment intended to make enlarged projections of slides with previously prepared subjects, on the board or other white surface (FERREIRA, 1996), after being used in World War II, they became part of the collection of all American schools. According to Adans and Backer (2023), some advantages can be highlighted, such as simple handling, easy transport, replaces the blackboard, among others, a disadvantage was that the lamp responsible for the projection burned out frequently and had a high price (ANTONIO, 2010).

Typewriter - basically used by teachers to prepare texts, lessons or even didactic material to be run on the mimeograph;

Slide projectors - Industrialized equipment and a set of lenses that magnify your image intended to project slides on a screen from photographs taken by teachers or acquired in the pedagogical market (MUNDOEDUCAÇÃO, 2019). It was one of the first pieces of technological equipment introduced in the classroom.

Television - It was somewhat successful with the advent of the video cassette where it was possible to watch programs previously recorded or marketed by professional companies producing didactic material, everything that is shown on television is educational (MORAN, 2003)

Video Cassette - had some use, but depended on television to project the recorded film.

DVD - Industrial equipment that depended on television, intended to play the existing movies on the DVDs.

White Formica Board – It was an adaptation to replace the blackboard, a sheet of white formica was affixed to the blackboard, since the dust coming out of the chalk was a cause of allergy for some teachers.

Whiteboard Marker – Blue, black and red brush used to write on the formica board.

Multimedia Projectors – It is an industrialized equipment capable of projecting images, schemes, films, figures, maps and other illustrations of content taught in the classroom, in a much more realistic, practical and pleasant way than the board and chalk (ANTONIO, 2010),

Computer - It can be considered an educational technology when it is part of a set of actions (praxis) at school, at home or in another place with the objective of teaching or learning (typing a class text, using educational software or accessing a website on the Internet), involving a relationship with someone who teaches or with a learner (CYSNEIROS, 1999). The notebook was a fulminating attraction for people, the enchantment was immediate, programs and applications fell into everyone's taste, no one wanted to be left out of this new tool that brought many novelties.

Software – It is a sequence of written instructions to be interpreted and processed by a computer's internal system to perform specific tasks (CARVALHO, 2016). It can also be called instructions, programs and data that command the operation of the computer, allowing interaction between the user and the machine.

Internet – In 1989, the National Research Network was created with the objective of coordinating the availability of Internet access services in Brazil. In December 1994, the commercial exploitation of the Internet began from a pilot project by Embratel.

The Internet can enable communication and the sharing of resources and data with people on your street or around the world. One of the greatest advantages of the Internet is that it is a tool that provides access to a huge amount of information that is available all over the world (GARCIA, 2010), its use in the school environment is a challenge to be overcome by teachers in recent times, as it represents a socializing conception of information, available to all.

The (TDCI) did not stop there, the internet spread considerably reaching a good part of the country becoming available to practically all people, from north to south, and in the last decade a new figure became a protagonist within the reach of a large part of the population, the cell phone, along with the internet became part of everyone's daily life and with it information is literally in the hands of people everywhere, no matter how far away it may be.

What matters is that educational institutions are more modern than ever, enjoying the most innovative and current digital communication and information technologies available, providing students with teaching materials enriched with explanations with images that most of the time had to be imagined by students.

We cannot fail to mention the evolution of the legislation that deals with the use of communication and information technologies available for education, allowing and stimulating their introduction in schools and in the educational process.

LDB No. 9394 of 1996, the National Curriculum Guidelines (DCN) of Basic Education of the year 2013 also launch the principles of the curricular organization of Elementary and Secondary Education, determining that:

The common national base of high school curricula will be organized into areas of knowledge, namely: languages, codes and their technologies; Natural sciences, mathematics and their technologies; human sciences and their technologies (art.10 of Resolution CNE/CEB n.03/98).

Resolution No. 6, of September 20, 2012, in its article 26, sole paragraph, says: Respecting the minimum expected duration and total workload, the technical course plan of secondary level may provide for non-face-to-face activities, up to 20% (twenty percent) of

the daily workload of the course, provided that there is technological support and service by teachers and tutors is guaranteed.

The use of smartphones in the classroom is supported by decree in the Sole Paragraph of Article 1 of the National Congress:

Portable electronic devices will be admitted in the classroom of basic and higher education establishments, as long as they are inserted in the development of didactic-pedagogical activities and duly authorized by the teachers or management body (BRASIL, 2007).

Ordinance No. 2,117, of December 6, 2019, provides: "HEIs may introduce the offer of workload in the distance learning modality in the pedagogical and curricular organization of their face-to-face undergraduate courses, up to the limit of 40% of the total workload of the course, which must include teaching-learning methods and practices that incorporate the integrated use of Information and Communication Technologies – ICT for the achievement of pedagogical objectives, specific didactic material as well as for the mediation of teachers, tutors and education professionals with training and qualification at a level compatible with that provided for in the PPC and in the teaching plan of the discipline.

With the evolution of the industry and modern projection equipment such as multimedia projectors replaced overhead projectors, improving and enriching the illustrative images of classes and subjects taught, increasingly modern agricultural machinery, irrigation equipment, agricultural production technologies modernized, until in recent decades digital communication and information technologies have emerged with devastating speed, in a way never seen before, combined with the Internet, revolutionizing the entire education system, requiring large investments by the institution in computers as a tool to meet the desires of students and teachers to discover this new world full of information within the reach of a "click", enabling the increase of classes with images and sounds on practically all possible subjects, multimedia projectors, programs and applications, such as Power Point, used in computers completed what we now call Digital Communication and Information Technologies (TDCI).

FINAL CONSIDERATIONS

The digital technologies of communication and information, computer, cell phone, software, applications, combined with internet access, are advancing and developing more and more in all sectors of society, as well as in education, has been a promise to facilitate,

organize and streamline pedagogical tasks, with updated images and subjects, making pedagogical activities more dynamic, making the teacher assume once and for all the role of mediator of learning, and transforming the student into an agent of the construction of his own knowledge, making study schedules more flexible, enabling individual development in due time, supported by the permission of the legislation that provides on the subject.

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