The context of Professional and Technological Education in pandemic times: On curricular practices and the use of digital technologies

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ABSTRACT

This article refers to a completed research on a remarkable moment experienced throughout the Brazilian educational context: the unexpected transition from face-to-face to remote teaching, during the period of social isolation, caused by the Covid-19 pandemic. The focus of the research was directed to Professional and Technological Education, with the Federal Institute of Espírito Santo (Ifes) as the locus of the investigation, covering the movement of implementation of non-face-to-face pedagogical activities (APNPs) in the institution, in a period of remote classes and flexible return to face-to-face classes. It is, therefore, a research that seeks to problematize the implementation of these practices with emphasis on the perspectives of curricular integration and integral human formation, as well as highlights the connections that occurred between the use of digital technologies and the integrated curriculum in the context of technical courses integrated with high school. As theoretical assumptions, the ideas of authors considered as references for the study of the themes of work and education, integral human formation, integrated curriculum, Professional and Technological Education (EPT) and digital technologies applied to the school context, such as: Frigotto, Ciavatta and Ramos (2005); Mancorda (2017); Kuenzer (2002); Mill (2014); Kenski (2011); Bacich, Neto and Trevisani (2015); Pischetola (2018) and Moran (2007). The approach used in the research is qualitative, exploratory, with emphasis on research with daily life and presents as its main methodological resource the semi-structured interview. As a result of the research, it is highlighted that after the pandemic period, digital technologies began to be more used in the context of Integrated High School (EMI) courses, as well as reaffirming the need for the use of these technologies to be increasingly present in classrooms. The research thus points to the expansion of the use of Digital Information and Communication Technologies (DICT) in curricular practices, being necessary to guarantee adequate working conditions, as well as the realization of permanent teacher training processes. During the research, an educational product was also produced, consisting of a continuing education course for teachers (in E-book and MOOC formats) entitled "Digital technologies applied to Integrated High School in the context of Professional and Technological Education", with emphasis on contents, resources and procedures for pedagogical practices, seeking to collaborate with the expansion of the use of these technological tools in Integrated High School, in addition to contributing to the integral human formation of students.

Keywords: Professional and Technological Education, Integrated High School, Non-Face-to-Face Pedagogical Activities, Curricular Integration, Digital Technologies.

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INTRODUCTION

ON THE THEME AND THE PROBLEM OF THE RESEARCH

Like other teaching modalities, Professional and Technological Education (EPT) survived the real "earthquake" that the Covid-19 pandemic meant in our country. Considering this context, our study problem arose from the interest in investigating a recent event that occurred throughout the educational context: the unexpected transition, which occurred in an emergency manner, from face-to-face teaching to remote teaching and, later, to flexible teaching - with remote and face-to-face activities - during the period of the pandemic caused by the spread of the SARS-CoV-2 virus. It is worth noting that we are considering "remote teaching" to be teaching-learning practices carried out in an online format, through digital platforms and technologies, without the presence of teachers and students in the physical spaces of schools.

The pandemic experienced and faced by the world until the year 2023 – since the World Health Organization (WHO) decreed the end of the pandemic caused by the Coronavirus on May 5, 2023 – forced, in a way, that teaching was taught remotely by educational institutions, especially during the most critical period of proliferation of the virus. Teachers, students and families had to adapt to the new educational and life reality, after all, humanity was subjected to a picture of destruction. It is worth mentioning the data presented by the Ministry of Health website[5], referring to our country: the records made since the most critical period of the pandemic accounted for 22,287,521 notified cases and 619,056 confirmed deaths as notified cases and deaths between March 2020 and December 2021 in Brazil, as well as the update of the website, verified in November 2023, confirming 38,048,773 notified cases and 707,470 confirmed deaths, with 184 deaths caused by Covid-19 still in 2023[6].

In the context of the pandemic, when analyzing the case of the Integrated High School (EMI) courses at the Federal Institute of Espírito Santo (Ifes), which had, at the time, their structure organized in a fully face-to-face manner, it was possible to observe an abrupt transition from face-to-face teaching regularly offered to remote teaching, in the 2020 school year, offered through non-face-to-face pedagogical activities (APNPs)[7], considering the urgent need for social isolation by the academic community for what was called the "new normal". The use of masks, constant hand hygiene and the limitations of crowding of people made the entire population start to experience another routine.

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[5] The https://infoms.saude.gov.br website was constituted as a platform for data and strategic information on Covid-19 made available in an analytical way, as the description itself is given on the page, containing the profile of cases, number and distribution of resources, beds, tests, medicines, ventilators and Personal Protective Equipment (PPE).
[6] Update verified on 11/18/23.
[7] Non-face-to-face pedagogical activities (APNPs) was the term adopted to name the activities carried out *online,* provided for in the Resolution of the Superior Council of Ifes No. 001/2020, which regulated and standardized the replacement of face-to-face classes with remote classes.

This transition movement had a great impact on the lives of those involved and some questions arose at this point in the investigation: *Would it be necessary to prepare students and families before implementing online activities in the curricular practices of face-to-face courses? What technologies currently exist could be used for this implementation? Would it be necessary to continuously train teachers in the use of digital technologies applied to education, considering a teaching format with virtual activities? Is it possible to implement online activities in the expected and mandatory workload of EMI courses?*

In view of this scenario and seeking some clues for the investigation, it was possible to observe the technological leap that has occurred in teaching-learning practices in recent years. We highlight, in this sense, that the school has been expanding the use of technologies and gradually being equipped, and we cannot deny that the pandemic period "advanced" the realization of this process by a few years, as remote teaching ended up reaching places that were not so inhabited by technological tools before. For Mill (2014), the presence of Digital Information and Communication Technologies (DICT) has caused relevant changes in the educational context, related to the ways of teaching, the resources used, the attitude of teachers and even the way educational systems are organized.

We understand, therefore, that the realization of the APNPs, in the initial format of remote teaching, guaranteed the continuity of studies, by the students of integrated high school, in the midst of the situation of social isolation and in the face of the health crisis in which we found ourselves, being an important "way out" found by managers and teachers, as an action undertaken by the Federal Institute of Espírito Santo.

RESEARCH OBJECTIVES: GENERAL AND SPECIFIC

In view of the above, our main objective is to problematize the process of implementation of APNPs in Integrated High School, within the scope of the Federal Institute of Espírito Santo - Ibatiba campus, through the pandemic context, with an emphasis on the investigation of curricular practices produced between face-to-face and *online activities* and from the perspectives of curricular integration and integral human formation.

In addition, other guiding axes of our research are also to investigate the uses of digital technologies applied to education, driven by APNPs, as instruments of innovation in the curricular practices of EMI courses; discuss the perspectives of curricular integration and integral human formation at EMI considering the activities experienced between face-to-face teaching and non-face-

to-face teaching; investigate the curricular practices produced between teachers and students at EMI during face-to-face and online activities, in a pandemic context, at the Ibatiba campus of Ifes[8].

APPROXIMATIONS OF THE THEORETICAL FRAMEWORK, METHODOLOGICAL PROCEDURES AND DATA PRODUCTION OF THE RESEARCH

During the entire research, we used theoretical assumptions related to the perspective of integration and curricular production, as well as discussed the use of technologies in this context and integral human formation as a pillar of Professional and Technological Education.

As theoretical intercessors for the work, we sought the ideas of authors considered as references for the study of the themes of work and education, integral human formation, integrated curriculum, Professional and Technological Education and digital technologies applied to the school context. In this sense, we dialogue with the studies of Frigotto, Ciavatta and Ramos, (2005); Manacorda (2017); Saviani (2007) and Kuenzer (2002) to broaden the discussions of EFA in Brazil and, also, considering that one of the objectives of the research is related to discussing the use of technologies during and after the implementation of APNPs, as an instrument of innovation in the teaching and learning process in EMI courses, we approach the ideas of researchers of digital technologies in the school context, with emphasis on Kenski (2011); Bacich, Neto and Trevisani (2015); PISCHETOLA (2018); Moran (2007) and Mill (2014).

In this sense, some highlights are made during the research to reaffirm, for example, the important *permanent updating of the curricular organization,* since the world is in a constant process of change, both in social, political, cultural contexts and in economic aspects and focused on the productive sector; the search for *understanding and discussing the social relations of production and work*, because one of the principles of EFA is to form a citizen who understands the entire production process and the stages of this process, as well as the social relations intrinsic to these processes, as Frigotto (2005, p. 58) taught us when he pointed out the necessary "[...] deepening the understanding of work: in its dimension of creation of the human being (ontocreative) and [in] the historical forms that work assumes in class societies, [in] the current context of globalization or [in] the globalization of capital."

Hence the need to broaden the discussion of curricular integration a little more, essential for the proposal of the courses of Technical Professional Education at the Secondary Level. We can say that, currently, we have the structure for the offer of Integrated High School more consolidated in our

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[8] The Federal Institute of Espírito Santo (Ifes), Ibatiba campus, is located in the municipality of Ibatiba, located on the banks of BR 262, in the south of the State of Espírito Santo and is inserted in the micro-region called "Caparaó" - a large area of environmental and forest preservation located in the southwest of Espírito Santo and southeast of Minas Gerais. The Caparaó region is well known for its vocation for agritourism and ecotourism.

education system, but we also know the challenges we face in the face of the proposal of integral human formation of the subject. Chisté (2017, p. 41) contributes by stating that

> [...] it is possible to assume that, with the current structure of Integrated High School, meeting all legal and theoretical prerogatives becomes increasingly difficult, if possibilities of overcoming it are not thought of, through public policies and the reflection of the collective of teachers and other professionals. It is necessary to systematize the integration of knowledge in the search for propositions that put an end to the instrumentalization of young people and their preparation for the labor market in the technicist molds. On the pedagogical level, this proposal presupposes the integration of all disciplines, without compartmentalizing knowledge.

The strategy of not compartmentalizing content and knowledge can be considered one of the greatest challenges in the EMI proposal. As much as the Pedagogical Projects of the Courses (PPCs) are built aiming at curricular integration, in the performance of daily activities, even seeking that the dichotomy between theory and practice is not present, a lot of effort is needed for more interdisciplinary and contextualized actions to occur in the curricular practices of these integrated technical courses.

Other relevant highlights concern the *intellectual mastery of technologies and the expansion of their uses*, considering that it is not the objective of EFA to train a worker who is only operational, but who can master multiple languages and tools for the creation of new knowledge and techniques, that is, who can also express himself through numerous forms of creation, "[...] formulate their thought and express themselves as an author" (Pischetola, 2018, p. 198) and with *the knowledge required to exercise their profession with autonomy and responsibility, guided by ethical, aesthetic and political principles.* In other words, we defend an education that gives the citizen the perception of different conceptions of society and work, as well as a critical understanding of their necessary ethical action, aiming to ensure the creation of a less unequal and, consequently, more just and solidary society, based on "a praxis capable of transforming the social relations in force in society and in educational processes" (Frigotto, 2005, p. 58).

We understand, therefore, that the integral education of the student in EFA is related to personal, academic, cultural, professional aspects, among others, as presented in the National Curriculum Guidelines for High School (DCNEM), Art. 5, item I: "integral education of the student, expressed by values, physical, cognitive and socio-emotional aspects" (Brasil, 2018).

In the context of digital technologies, the research points out that it is interesting to think of these technologies as providers of interactivity among students. According to Candau and Sacavino (2018, p. 213), "[...] What technology does today is integrate different spaces and times. The articulation in the processes of teaching and learning between the face-to-face and digital worlds", which we understand can expand the possibilities of connection between students and the content to be worked on in the school context. It is about seeking an approximation between the "virtual world"

already known by many and the activities proposed by the curricular components of the integrated technical courses, considering the context of EFA.

> The introduction of ICT [Information and Communication Technologies] in education demands didactic strategies capable of promoting a variety of learning processes and alerts to the urgency of a review of pedagogical practices. Facing the implications of these changes presupposes seeking new methodologies for the pedagogical use of ICT, not only reproducing traditional practices with other supports, but creatively exploring the new possibilities made possible by the new media (Pischetola, 2018, p. 199).

Based on Mill (2014), we consider an update of the expression Information and Communication Technologies (ICT) to Digital Information and Communication Technologies (DICT), when the author also states that the presence of DICT has caused relevant changes in the educational context, both in conventional classrooms, face-to-face teaching, and in the Distance Education (DE) modality. relating these changes to the ways of teaching, the resources used, the posture of teachers - who now assume a more collaborative, orientation profile - and even the way educational systems are organized.

According to Pischetola's (2018) ideas, the concept of pedagogical innovation has also been associated with DICT, which are seen as "support tools" for teaching practices, when "used as 'allies' by subjects who have overcome their 'resistance' to use in the classroom" (Idem, p. 187). In fact, we consider that there may be some resistance on the part of teachers because they do not feel safe, often because their training processes have not emphasized the use of digital technologies, alternatives and methodological resources possible from this use, in the most diverse educational spaces and times. In addition, the author herself points out other obstacles to the use of these technologies more broadly by the different education systems in our country, such as the lack of infrastructure (equipment, operation, adequate facilities), technical support and bureaucracies.

Thus, when we consider these issues related to the uses of digital technologies in the curricular practices of integrated education, that is, thinking about the insertion/expansion of these technologies in the curricular context of EMI courses, it leads us to the idea of an extension of the methodologies used, leading us to highlight, once again, teaching beyond the "physical" classroom. This perception also deconstructs the idea that digital technologies could only benefit the Distance Education modality, because, for Moran (2007, p. 9) "the physical and virtual worlds are not opposed, but complement each other, integrate, combine in an increasingly larger, continuous, inseparable interaction".

Regarding the methodological procedures, the approach used in the research is *qualitative,* with an exploratory character and based on the assumptions of research *with daily life* (FERRAÇO, 2003), with the semi-structured interview as the main methodological instrument. The approach was also chosen taking into account that the production of data had the direct participation of the subjects

of the investigation, being teachers who work in Integrated High School courses and some professionals from the administrative/pedagogical structure of Ifes.

Considering the exploratory character, according to Gil (2010, p. 27), "exploratory research aims to provide greater familiarity with the problem, with a view to making it more explicit or to construct hypotheses". This exploratory bias arose because our work constituted direct contacts between the researcher and the research space and the experiences lived and shared by the research subjects, in a way, also guided the course of the research throughout the process.

The analyses based on the assumptions of research *with* everyday life were carried out from our desire to immerse ourselves deeply in the *locus* of the research, in the chosen context. About the research *with* everyday life, Esteban (2003, p. 200) explains:

> Research in everyday life poses some questions that require specific methodological prepositions, and an adaptation of the instituted procedures is not enough, as it is not a research that intends only to construct explanations for the phenomena found, but seeks to deepen the understanding of reality in a dialogical perspective linked to intervention processes.

Seeking a greater understanding of the context of the investigation, therefore, our work began with a bibliographic study, with the aim of expanding knowledge about the research problem, with emphasis on the discussions of curricular integration and integral human formation, as well as on the use of digital technologies applied to education and the possibilities of articulations and curricular practices experienced between face-to-face teaching and *online* teaching proposals at EMI.

Thus, the first stage of data production comprised a documentary survey of all the regulation of APNPs at Ifes. This stage included a thorough study of institutional legislation from the suspension of face-to-face classes, on 03/17/2020, to the flexible return, in 2021, and the full return of "face-to-face" in 2022. During the pandemic context, face-to-face teaching at Ifes underwent several adaptations, several resolutions and normative instructions were published in order to guide the operation of remote teaching, as well as the evaluation process and the registration of student attendance during the period of remote classes and flexible return to face-to-face classes. In order to highlight the movements carried out in the *locus* of the research, we also sought information and records through internal ordinances, photographs, *screenshots* of the institutional website and social networks in order to demonstrate how the Ibatiba campus of Ifes dealt with the period of remote classes with regard to the implementation of APNPs.

We emphasize that at this stage, when we immersed ourselves in the pandemic period, we realized how Ifes sought alternatives to "deal" with the situations that arose with the pandemic and how that whole process was constantly unpredictable, as the normative guidelines were reviewed and changed according to the context of the pandemic that was maintained and with the *feedback* of the parties involved. Ifes managers cautiously managed the APNPS period, following the guidelines of

the World Health Organization (WHO) and prioritizing student learning through welfare policies to ensure access to the internet.

In the second stage of the investigation, we interviewed thirty professors, a representative of the pedagogical sector of the campus and a professional from the Dean of Education of Ifes. In other words, we listened to professors and professionals from the institution's administrative/pedagogical structure, seeking to share experiences with a focus on the pandemic period and the use of digital technologies used. The narratives produced in the movement of the interviews allowed us to experience the implementation of the APNPs in several aspects. In addition to the semi-structured interviews, we asked the teachers participating in the research for permission to access the virtual rooms, structured in the Virtual Learning Environment - VLE Moodle - in the academic years 2020 and 2021, and the teachers helped us, once again, allowing us to immerse ourselves even more in the daily life studied.

In the midst of the research movements, the elaboration of our educational product also took place, collectively, which consists *of teacher training focused on the discussion of the use of digital technologies in Integrated High School.* The construction of the product began at the time of the interviews, as our intention was to produce teacher training that met the needs of teachers about the use of digital technologies and, at each interview, we had more elements that made us believe that this was an important proposal, since we realized how the lack of familiarity with digital technological tools affected the realization of APNPs. Thus, we dedicated questions from the interview scripts to this purpose, seeking to know from the professors what their desires and needs were about the use of these technologies.

FINAL CONSIDERATIONS

As we have presented throughout this article, the research problematized the implementation of non-face-to-face pedagogical activities, as an action undertaken by the Federal Institute of Espírito Santo in a pandemic period, considering, in this sense, the curricular and didactic-pedagogical dimensions of the practices carried out in the context of Integrated High School (EMI) courses. An investigation that focused, therefore, on the perspectives of curricular integration and integral human formation, as well as highlighted the connections between the digital technologies used and the integrated curriculum in the context of these courses.

Through the reality of the pandemic, a historical milestone for educational processes, it was possible to relive and problematize with the research subjects the entire process of implementing the APNPs, in addition to getting to know more closely the methodological innovations created by teachers in this period and the challenges faced in the face of the need for the constant use of digital technologies in teaching, especially during the period of social isolation.

In this way, the research work helped to understand that teachers are fully able to innovate and expand the use of Digital Information and Communication Technologies in their curricular practices, and it is necessary, however, that the working conditions favor this use – such as resources, equipment, access to the network, etc. – as well as that the training processes are constant, including those related to the incessant innovations and technological acceleration of today.

We also highlight that from this understanding occurred the creation of the Educational Product, during the research, in the format of "continuing education course for teachers" in order to present themes, resources and procedures that can collaborate with the training processes of teachers who work in Integrated High School courses, in the context of Professional and Technological Education, with regard to the use of these digital technologies, understood, in this scenario, as instruments of innovation for curricular practices, especially for a post-pandemic context.

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