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Educational technologies and teacher education: a documentary analysis of the integrative projects from the Univesp repository

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Abstract: The study analyzes educational technologies in teacher training based on Universidade Virtual do Estado de São Paulo – Univesp's Integrative Projects (PIs). Through the analysis of 18 projects, this research identifies some advances in digital skills and innovative practices, as well as challenges related to infrastructure and continuing education. This study concludes that the PIs

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contribute to a critical, reflective teacher training aligned with contemporary demands.

Keywords: Integrative Project; Teacher Training; Educational Technologies.

Tecnologias educacionais e a formação docente: uma análise documental dos projetos integradores do repositório da Univesp

Resumo: O estudo analisa as tecnologias educacionais na formação docente a partir dos Projetos Integradores (PIs) da Universidade Virtual do Estado de São Paulo – Univesp. A partir da análise de 18 trabalhos, a pesquisa apontou avanços em competências digitais e práticas inovadoras, além de desafios relacionados à infraestrutura e à formação continuada. O estudo conclui que os PIs contribuem para uma formação crítica, reflexiva e alinhada às demandas contemporâneas.

Palavras-chave: Projeto Integrador; Formação Docente; Tecnologias Educacionais

Tecnologías educativas y la formación docente: un análisis documental de los proyectos integradores del repositorio de la Univesp

Resumen: El estudio analiza las tecnologías educativas en la formación docente a partir de los Proyectos Integradores (PI) de la Univesp. Através del análisis de dieciocho trabajos, se identificaron avances en competencias digitales y prácticas innovadoras, además de desafíos de infraestructura y formación continua. Se concluye que los PI contribuyen a una formación crítica, reflexiva y alineada con las demandas contemporáneas.

Palabras clave: Proyecto Integrador; Formación Docente; Tecnologías Educativas.

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1 INTRODUCTION

In recent decades, the use of Digital Information and Communication Technologies (DICTs) in the educational field has intensified, becoming one of the pillars of public policies for teacher education and pedagogical practices in school systems (Brasil, 2023; Kenski, 2012a; Lopes; Pastorio, 2023; Moran; Valente, 2000). This movement reflects not only an adaptation to the technological transformations of contemporary society, but also the search for didactic-methodological innovation and formative processes connected with the challenges of 21st-century education (Moran, 2019; Moran; Valente, 2000).

In this context, undergraduate teacher-education programs (*licenciatura*) focused on initial teacher education have been incorporating curricular proposals that integrate the use of DICTs with meaningful pedagogical practices (Brasil, 2019). One such proposal is the Integrative Project (PI) at the Virtual University of the State of São Paulo (Univesp), which invites undergraduate education students to develop projects with the potential to impact the educational reality of their communities, encouraging the use of technologies as tools for pedagogical transformation (São Paulo, 2018, 2020a, 2020b, 2022).

Recognizing the potential of the Integrative Project (PI) as a curricular component, this article focuses on analyzing the incorporation of DICTs into initial teacher education at Univesp. The guiding question of this investigation is: what contribution does the Integrative Project make regarding the use of DICTs to the professional teacher education of Univesp students?

To answer this question, the main objective was to identify the primary categories guiding the process of connecting theoretical-practical content with the use of DICTs. Specifically, we sought to: (i) identify PIs that address, directly or indirectly, the use of educational technologies in teacher education; (ii) map which technologies are used in these projects; (iii) understand the purposes for which DICTs are deployed; and (iv) analyze the role of these technologies in undergraduate students' learning. This is a qualitative, exploratory research study (Lima, 2003), grounded in a literature review and document analysis (Lüdke; André, 1986) of the works available in Univesp's institutional repository. For content analysis, we used the methodology proposed by Bardin (1977), which enabled data categorization and interpretation. Based on specific filtering and access criteria, eighteen projects were selected that most directly address the relationship between DICTs and professional teaching practice. These projects highlight both the development of digital skills and the appreciation of teacher

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agency in mediating between pedagogical knowledge and technological tools, reflecting the principles of the institution's pedagogical proposal.

The choice of this research subject is justified by the formative and social relevance of the Integrative Project, which promotes connection between theory and practice, between the university and the school, and between individuals and educational territories. At the same time, it highlights trends and gaps in the pedagogical adoption of digital technologies. Considering the growing demand for innovation and critical appropriation of DICTs by future teachers, analyzing how this theme has been addressed in the projects produced by the undergraduate students themselves allows for the identification of advancements, challenges, and concerns that permeate teacher education in digital environments.

This article is organized as follows: in the next section, we present a brief theoretical review on educational technologies and teacher education; next, we detail the research methodology and the procedures for data selection and analysis; subsequently, we discuss the main findings; finally, we present the final considerations, highlighting formative implications and future research possibilities.

2 THEORETICAL REVIEW

The integrative project, as a dialogic and active educational process, is aligned with the requirements of 21st-century teacher education. Teacher educators must create learning situations that prioritize dialogic and reflective processes, while always respecting moments of individual appropriation, internalization, and production (Almeida, 2005; Batista, 2021).

When analyzing the context of advancing information and communication technologies in society, it becomes clear that the school is a privileged space for preparing critical citizens who intervene in the world and use information and communication technologies ethically. Thus, it is up to teachers to rethink their pedagogical practices starting in initial training, since they will teach in a new school institution shaped by children, youth, and adults who are active users of digital tools.

Information and communication technologies transform teaching by shifting the educator's role from a transmitter of content to a stimulator of student curiosity. Consequently, students begin to explore, research, search for, and systemize information, leading them to debate, contextualize, and build knowledge that connects with their reality and fosters a critical and reflective stance (Lévy, 1993). A fundamental aspect of teacher education and practice is the need to foster individual and

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collective learning, enhanced through active methodologies and digital resources. Thus, education and practice share an essential connection, as it is through a formative exercise immersed in cyberculture that teachers will be prepared to handle new forms of expression and resources.

The literature in teacher education conceives professional development as a continuum, starting from initial training and extending into continuing education, both marked by individual and collective learning (Machado et al., 2021). Although there are doubts regarding engagement, difficulties, or even "technophobia" among a segment of teachers concerning the use of digital tools, literature does not support these assumptions. In a study conducted with teachers from a municipal school system in the metropolitan region of Porto Alegre, a high level of teacher familiarity (92%) with technological resources was found, suggesting the creative and mediating potential of such tools; however, a challenge remains that "involves defining a clear training policy, planning, and theoretical-pedagogical assumptions in the implementation of formative actions" (Machado et al., 2021, p. 14).

In addition to promoting the inclusion and participation of teachers in an educational space that would be physically unfeasible in person, the structure of the digital environment itself fosters expanded communication. The planned and intentional use of information technology in continuing teacher education enriches and strengthens traditional teaching practices with new elements, as well as creates opportunities for greater teacher participation due to the virtual format—which would be limited in oral discourse—thereby generating a space for sharing experiences, reflecting on practices, and enhancing studies and readings (Gabini; Diniz, 2009).

Among the benefits of such fruitful interaction is peer dialogue, which transforms teaching practice. Based on a study conducted at a community university in Southern Brazil, a connection was identified between the development of digital fluency and changes in pedagogical practices through the creation of alternatives grounded in peer dialogue among teachers. In this process, "[...] advancement occurs at the didactic level, and acquiring skills to use technologies ceases to be the main focus in teacher education discussions, shifting toward the creation and/or adaptation of practices supported by DTs" (Modelski; Giraffa; Casartelli, 2019, p. 14).

Furthermore, this training model transforms classroom practices. In this direction, the use of information and communication technologies ultimately impacts how teachers conceive their classes, enabling fruitful new teaching and learning pathways: "diversified learning situations can chart a new direction away from the preponderance of lecture-based classes, as lecturing can no longer be considered the sole way to conduct a class" (Gabini; Diniz, 2009, pp. 7,369–7,370).

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It becomes evident that, rather than replacing teachers, as was suggested in recent debates, information technologies expand teaching competencies and merge with social, cognitive, and communicational dimensions. According to Brito and Purificação (2011), teacher education through digital resources fosters continuous improvement in the development of individual capacities, requiring both the restructuring of educational processes and the updating of the agents and institutions involved in education.

It is up to teachers to utilize technologies to enhance teaching and learning within a context marked by ever-increasing hybridity. In this process, educators must identify the most effective ways to integrate technologies into the methodological procedures used in their teaching practices, placing special emphasis on interpersonal/group and audiovisual/telematic communication aspects (Moran, 2019).

The formative experiences of the integrative project satisfy educational requirements and—through its Design Thinking (DT) methodology and collaborative, reflective process—put into action the principles advocated by the most recent literature on teacher education and the use of technology. This enables the development of a reflective, critical, and transformative teaching practice committed to the use of ICTs in education.

3 METHOD

In line with the predominant trend in the development of scientific literature in Education, this article adopts a qualitative research approach (Lima, 2003). Document analysis (Lüdke & André, 1986) serves as the basis for constructing the textual corpus, while the content analysis techniques proposed by Bardin (1977) are employed to answer the following research question: "What is the contribution of the Integrative Project regarding the use of DICTs to the professional teacher education of Univesp students?"

The Integrative Project is a methodological framework based on a theoretical-practical approach present in the curriculum of all Univesp degree programs. Through it, students—working collaboratively in groups—"must research and resolve problem situations related to the reality and daily life of their program's field of knowledge and discipline" over the course of a semester (São Paulo, 2022, p. 2). Thus, students are expected to develop competencies and skills related to their future professional practice.

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The Integrative Project (IP) is anchored in two active methodologies: Design Thinking (DT) and Problem- and Project-Based Learning (PBL) (Garbin et al., 2020). This means that students are prompted to mobilize knowledge to resolve problem situations within the educational context. DT is human-centered and follows defined stages in its development process: listening, defining, ideating, prototyping, and testing. In turn, PBL places the student at the center of the teaching-learning process through collaborative work. Thus, when presented with real-world problem situations, students have the opportunity to propose and implement solutions for a professional and social context while still in their initial training phase. Throughout their degree program, students participate in multiple IPs organized on a semester basis, with new themes introduced each semester depending on the student's academic progress.

The documents analyzed in this paper were retrieved from the public repository of academic reports resulting from semester-long IP projects at Univesp. This repository features projects that stood out in terms of execution and innovation. "These are projects that successfully engaged with the external community, offering proposals to improve the daily lives of this population" (São Paulo, 2025). The selection of these projects occurs in a two-stage process, conducted first by IP advisors and subsequently by course supervisors. Therefore, given the curation involved, the projects in the repository were considered representative of good practices, even if they do not encompass the entirety of student output at the institution.

In seeking to address initial teacher education at Univesp, we restricted our selection for this study to degree programs within the teacher education track: Language and Literature, Pedagogy, and Mathematics. The Univesp IP repository, where these materials are digitally stored, does not provide search tools by period; it only features a filter by degree program and a search field labeled "keywords," which allows only one term to be queried at a time.

When using the descriptor "technology" in the search, 47 projects were found in the overall teacher education track, four projects in the Pedagogy program, one project in the Language and Literature program, and one project in the mathematics licensure program. In this case, it was observed that the Pedagogy projects and the project identified in the mathematics program were also listed under the general teacher education track. This suggests that the obtained data does not necessarily reflect a higher or lower volume of production by degree program, but rather potential limitations of the search platform and/or the project submission process.

Following this initial filtering of projects, and using qualitative approaches (Lima, 2003), we

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read the abstracts of the works and selected only those that addressed the use of DICTs within the context of professional teaching practice. Another exclusion criterion was the incompleteness or unavailability of the full text, which made the analysis of certain documents unfeasible. At the end of the refinement process, 18 projects—comprising academic texts and short videos—were selected. Nevertheless, the subsequent analysis focused strictly on the texts, as they were more detailed and comprehensive.

During the organization of the material, it was noted that the most recent selected projects date from 2024, and the earliest ones from the first year of operation of the digital repository, confirming the continuous nature of the production and posting of the Integrative Projects. Below are listed the 18 projects that demonstrated the highest alignment with the central theme of the research:

1. Strategic Educational Application of ChatGPT in Geography Teaching (Aplicação Estratégica Educacional do ChatGPT no Ensino de Geografia)
2. Continuing Education for Teachers: The Use of the Interactive Display as a Pedagogical Tool (Formação continuada para professores: o uso da tela interativa como ferramenta pedagógica)
3. DICTs: Producing New Meanings for Classroom Learning (TDICs: Produzindo novos sentidos para a aprendizagem em sala de aula)
4. Active Methodologies and Their Platforms: Utilizing Tools Embedded in the School Curriculum (Metodologias ativas e suas plataformas: utilizando as ferramentas inseridas no currículo escolar)
5. Technology in the Classroom: Connecting to the Interpretation of Mathematical Problems (Tecnologia em sala de aula: conexão para interpretação de problemas matemáticos)
6. Challenges and Solutions: The Use of NICTs in Reducing Literacy Gaps in 5th Grade (Desafios e Soluções: o uso das NTICs na redução da defasagem de alfabetização no 5º ano)
7. Kahoot Technology as a Pedagogical Tool in Mathematics Teaching and Learning (A tecnologia Kahoot como ferramenta pedagógica no ensino-aprendizagem da matemática)
8. How to Work with Advertising Texts in the Classroom Using Technology (Como trabalhar textos publicitários em sala de aula utilizando a tecnologia)
9. The Importance of Using Digital Technologies in Early Childhood Education (A

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importância do uso das tecnologias digitais na Educação Infantil)

10. The Use of Digital Technologies in the Literacy and Emancipation Process of Elementary School Students (O uso das tecnologias digitais no processo de alfabetização e emancipação dos estudantes do Ensino Fundamental I)
11. The Use of Digital Technologies in Literacy Instruction (O uso das tecnologias digitais na alfabetização)
12. The Use of Digital Technology for the Development of Reading Practice (O uso de tecnologia digital para o desenvolvimento da prática da leitura)
13. Educational Technology: Enhancing Reading and Text Comprehension with the Árvore Livros Platform (Tecnologia educacional: potencializando a leitura e interpretação de texto com a plataforma Árvore Livros)
14. Reading and Text Comprehension in the Digital Era (Leitura e interpretação de texto na era digital)
15. Digital Reading Focused on Audiovisual Books (Leitura digital com foco nos livros audiovisuais)
16. Audiovisual Book: A Technological Tool in Favor of Inclusion (Livro-audiovisual: ferramenta tecnológica a favor da inclusão)
17. Mathematics Teaching Through Games and Computer Activities (O ensino de matemática por meio de jogos e atividades computacionais)
18. Digital Technologies in Portuguese Language Teaching: Enhancing Cultural Expression (Tecnologias digitais no ensino da língua portuguesa: potencializando a expressão cultural).

The following sections address the discussion of the results. They articulate empirical evidence drawn from Univesp's Integrative Projects alongside theoretical foundations and legal frameworks governing teacher education and the pedagogical use of digital technologies.

4 FOUNDATIONS OF DIGITAL TECHNOLOGIES IN TEACHER EDUCATION

The incorporation of DICTs into teacher education is not merely a matter of using tools but also entails a profound transformation in the ways of teaching, learning, and understanding the role

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of education in contemporary society (Leal, 2025; Lopes & Pastorio, 2023; Oliveira & Araújo, 2021). To systematically analyze this topic, it is necessary to consider both the historical and legal frameworks guiding its implementation in educational public policies, as well as the pedagogical premises that underpin the development of digital competencies and the resignification of pedagogical practices.

This section, therefore, articulates these two dimensions—normative and pedagogical—aiming to understand the foundations that support the presence of DICTs in teacher education.

4.1 Historical and Regulatory Frameworks

The presence of technologies in the educational context is not a recent phenomenon. Their evolution and gradual insertion into pedagogical practices reveal significant shifts over time. Understanding how the educational use of technology has developed, alongside the regulations and policies that govern it, is essential for contextualizing teacher education mediated by digital resources.

Historically, the link between education and technology has evolved as new tools have emerged. Although resources such as radio and television had already been used in educational initiatives, primarily targeted at audiences in remote regions, it was with the expansion of computing and the internet that pedagogical practices began to incorporate Digital Information and Communication Technologies (DICTs) more significantly as an integral part of the training process (Moore & Kearsley, 2007; Costa & Valério, 2022).

During the 1980s and 1990s, the use of computers in school environments gained momentum, although it remained restricted to isolated actions. The arrival of the internet and digital platforms at the beginning of the 21st century expanded the possibilities for access to knowledge and opened space for more interactive and collaborative methodologies (Lévy, 1999). In this context, DICTs ceased to be seen merely as auxiliary tools and began to play a strategic role in the organization of teaching.

With this, the role of the teacher also underwent redefinition. From a transmitter of content, the teacher came to be conceived as a mediator of learning, responsible for fostering student autonomy, critical thinking, and creativity (Moran, 2015). Teacher education, therefore, began to require, beyond technical mastery, a critical pedagogical stance toward the use of technologies (Almeida & Valente, 2011).

In this scenario, Brazilian legislation recognizes the importance of technologies in the

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educational field, ensuring their use as part of the right to education. The Law of Directives and Bases of National Education (LDB, Law No. 9,394/1996) establishes, among its principles, access to technologies to enhance the quality of education.

The National Education Plan (PNE 2014-2024) reinforces this commitment by proposing targets that encourage the pedagogical use of DICTs. Target 7, for example, seeks to foster innovative practices using these technologies, and Strategy 7.5 directs the inclusion of content on DICTs in teacher education curricula (Brasil, 2014).

In addition, the National Common Curricular Base (BNCC), the guiding document for school curricula, includes digital culture among its general competencies, emphasizing the need to educate individuals capable of using technologies critically and responsibly (Brasil, 2018). Regarding initial teacher education, Resolution CNE/CP No. 2/2019 establishes that degree programs must incorporate experiences that connect pedagogical knowledge with the use of digital technologies, in an intentional and contextualized manner.

From this perspective, teacher education for the pedagogical use of DICTs has been the focus of various public programs and policies. One of the most prominent examples is the National Program for Continuing Education in Educational Technology (ProInfo Integrado), established in 2007, which integrates in-person and distance training actions, the distribution of equipment, and the development of digital content (Santos & Silva, 2010).

In recent years, especially during the COVID-19 pandemic, the demand for teachers' digital competencies intensified. On an emergency basis, various school networks adopted digital platforms to ensure the continuity of classes, revealing both the potential of technologies and inequalities in access and in the preparation of education professionals (Oliveira & Araújo, 2021).

In this scenario, initiatives such as Univesp's Integrative Project represent opportunities for practical and reflective experience with the use of technologies. Through the development of proposals connected to the school context, preservice teachers are encouraged to explore DICTs as allies in promoting more meaningful and empowering learning experiences.

Understanding the historical and legal trajectory of the use of DICTs in education provides a foundation for the challenges and potential of teacher education in the contemporary digital context. Below, the pedagogical impacts of these technologies on the development of teaching competencies are discussed.

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4.2 Digital Competencies and Pedagogical Practices

The use of educational technologies in teacher education emerges as an innovative, rather than merely technical, way to transform pedagogical practices. Mastery of the technique and the use of equipment allow teachers to co-create with their students new ways of exploring information, conducting collective and collaborative learning activities, and sharing the results of the studies conducted.

From this perspective, learning about technologies must necessarily lead to changes in pedagogical practices in the school grounds. One of the competencies required in teacher education by educational technologies is digital fluency, which refers to

> [...] the integrated use of technological resources, in which the teacher makes use of artifacts and produces content or material through them in a critical, reflective, and creative way. Thus, the more contact with resources, the more familiarity the user acquires, and thereby the possibilities of use expand. Therefore, constant updating is necessary to keep up with the changes caused by technological advances that transform the society in which we live (Modelski; Giraffa; Casartelli, 2019, p. 6).

Digital fluency as a competency can be characterized by theoretical and technological knowledge about tools, skills to explore, search, select, produce, and adapt, and attitudes of taking the initiative to seek innovations and remain continuously updated (Modelski; Giraffa; Casartelli, 2019).

Digital fluency ultimately impacts pedagogical practices, as mastery of technique allows teachers to focus more on the potential uses of these tools. According to Modelski, Giraffa, and Casartelli (2019), as teachers develop familiarity with technological resources, their attention shifts from technical issues to the didactic potential of these instruments. This fosters more creative and confident practice, in which the selection and adoption of digital technologies, such as tablets, smartphones, and other devices, become more seamlessly integrated into pedagogical practice.

The competency-based pedagogical approach aligns with the demands of focusing on the student and utilizing active methods, as it firmly invites teachers to:

> consider knowledge as resources to be mobilized; regularly work through problems; create or use other teaching tools; negotiate and conduct projects with their students; adopt flexible, indicative planning and improvise; implement and explain a new didactic contract; practice formative evaluation in work situations; move toward reduced disciplinary compartmentalization (Perrenoud, 1999, p. 52).

A fundamental point in this process is identifying how the use of information technologies

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allows teachers to act more as curators, tutors, and learning facilitators, making use of active methodologies combined with technology to promote reflective and participative education (Moran et al., 2013). To rethink teacher education in the 21st century, it is essential to understand the need to connect knowledge and practices that involve knowing, doing, living together, and being, to promote the integration of learning to produce meaning and transformation for individuals in the teaching and learning process. Furthermore,

> [...] learning to know, that is, acquiring the instruments of understanding; learning to do, so as to be able to act on one's environment; learning to live together, in order to participate and cooperate with others in all human activities; and finally learning to be, an essential pathway that integrates the three preceding ones. It is clear that these four pathways of knowledge constitute a single whole, given that there are multiple points of contact, connection, and exchange among them. However, as a general rule, formal education is oriented essentially, if not exclusively, toward learning to know and, to a lesser extent, learning to do. The other two forms of learning depend, most of the time, on random circumstances, when they are not considered, in some way, a natural extension of the first two. Now, the Commission believes that each of the "four pillars of knowledge" must receive equal attention from structured education, so that education appears as a global lifelong experience, on both cognitive and practical levels, for the individual as a person and as a member of society (Delors, 1998, p. 90).

In this direction, information and communication technologies, as tools, can contribute to achieving educational goals, since their structure enables the necessary connections for learning to do together and learning to know through investigation in an open environment where the research process occurs increasingly. To that end, competence does not depend solely on knowledge but goes beyond it; it is formed in the construction of a set of schemes and dispositions that make it possible to mobilize knowledge at the right moment and in the appropriate situation (Perrenoud, 1999). In addition, educational technologies allow for the exploration of multimodal resources, ensuring a greater diversity of ways to present knowledge to students, who are able to relate new information substantively to the knowledge they already possess, thereby generating meaningful learning (Ausubel, 2003).

The importance of learning technologies in teacher education is present in various educational documents, which highlight the development of competencies aligned with the demands of a constantly changing economy. According to Delors (1998), educational systems have the mission of educating citizens, promoting the transmission of knowledge and culture across generations, and preparing qualified individuals for the future challenges of the working world. The author emphasizes that the use of complex technologies, combined with creativity and adaptability, directly depends on

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the population's level of initial education. Thus, investment in education is understood as an essential factor for sustainable economic and social development, one that must be maintained even in times of crisis.

Discourses surrounding technologies tend to render invisible the ideologies that underpin them. In this process, it is necessary to be clear that the technical is political and that technologies are not neutral; on the contrary, they bring with them worldviews and cultural perspectives, formulations about thinking, acting, and teaching, and intentions regarding the formation of an individual. Thus, the use of technologies in teacher education must be planned critically and aligned with educational objectives (Kenski, 2012a).

5 UNIVESP INTEGRATIVE PROJECTS: ANALYSIS AND DISCUSSION

The review of work developed by Univesp preservice teachers within the scope of Integrative Projects offers a concrete perspective on how digital technologies have been incorporated into teacher education (Brasil, 2023; Kenski, 2012b; Moran & Valente, 2000). According to the institutional documents examined in this study, Integrative Projects constitute a pedagogical strategy of Univesp's degree programs, inspired by the methodology that combines problem-based learning (PBL) with project-based learning. This approach invites students to address real situations in everyday school life, proposing solutions that demand research, critical analysis, planning, and action.

In practice, the IP functions as a space for experimentation, where preservice teachers mobilize knowledge acquired in their courses, engage in dialogue with the reality of their school communities, and develop intervention proposals. It is, therefore, a proposal that breaks with training models focused solely on theory, valuing the active involvement of future teachers with concrete educational challenges.

5.1 The Role of Univesp Facilitators as Advisors in Integrative Projects

Integrative Projects challenge preservice teachers to develop projects linked to educational reality, mobilizing interdisciplinary knowledge and proposing solutions to concrete problems; therefore, a central aspect of their success is the presence of facilitators responsible for monitoring the development of proposals and offering pedagogical guidance throughout the process. These graduate

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students serving as facilitators act as mediators of the educational journey and contribute by giving suggestions, providing reading materials, offering feedback, and delivering reflective interventions. In addition to developing their theoretical education in the *lato sensu* post-graduate program in Distance Education for online course mediation, also offered by Univesp, the institution provides a scholarship and a specialization certificate for graduates.

In the projects analyzed, it is observed that the role of facilitators fosters the maturation of ideas and the articulation between theoretical foundations and pedagogical practices. The active listening of these professionals, combined with encouraging student autonomy among preservice teachers, constitutes a fundamental factor in consolidating proposals that are viable, creative, and consistent with the course objectives. Thus, the facilitator figure ceases to be merely technical support, becoming an essential element of teacher education in the virtual environment.

The importance of facilitators is intensified within Univesp, particularly because the projects undertaken in these studies demonstrated an approach to teacher education grounded in pedagogical experimentation with technology, the development of digital competencies, and the construction of meaningful educational strategies. Such a structure helps teacher education move beyond theoretical boundaries and draw closer to the social practice of education.

In this scenario, facilitation actions highlight the need for teacher agency as active agents in mediating between knowledge and digital tools, contributing effectively to the consolidation of the pedagogical use of DICTs in basic education. Beyond the factors already noted, the analysis of 18 projects dedicated to linking pedagogical practices with Digital Information and Communication Technologies revealed relevant trends, challenges faced, and training paths that students themselves construct throughout the course, which will be discussed further below.

5.2 General Aspects of the Corpus of Analysis

The analysis of the IPs allowed for an understanding of how initial teacher education has engaged in dialogue with the use of DICTs. Among the works consulted in the institutional repository, 18 aligned with the central theme of this research by systematically addressing the integration of technologies into the pedagogical process.

Furthermore, the analyzed productions prominently emphasize educational experiences centered on reflection, creativity, and pedagogical contextualization, as noted by authors such as

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Almeida and Valente (2011). These projects demonstrate a progressive understanding among preservice teachers regarding the role of the teacher in the contemporary digital context, highlighting qualified pedagogical mediation, the didactic appropriation of technological resources, and intentional teaching practice with the use of DICTs.

Some of these studies discuss the training of in-service teachers, such as the project "Continuing Education for Teachers: The Use of the Interactive Display as a Pedagogical Tool," which highlights gaps in teacher technological education and proposes the need for permanent training. Other projects, such as "Strategic Educational Application of ChatGPT in Geography Teaching," advance on emerging issues, such as the use of artificial intelligence in the classroom, proposing debates on its pedagogical uses and the ethical challenges involved.

In addition, a significant body of work is observed aimed at promoting reading, writing, and logical reasoning supported by technologies, showing the attempt to enhance learning through digital mediation. Projects such as "Educational Technology: Enhancing Text Reading and Interpretation with the Árvore Livros Platform" and "Technology in the Classroom: Connection for Interpreting Mathematical Problems" are examples of this orientation.

5.3 Central Themes of the Analyzed Works

Among the analyzed works, three major thematic lines stand out, namely: (i) digital literacy and foundational literacy with technological support: several projects focus on the use of DICTs to promote reading, writing, and text interpretation through platforms such as Árvore Livros or audiovisual resources accessible to basic education students; (ii) the use of active methodologies and gamification: preservice teachers also demonstrate interest in the application of more engaging pedagogical dynamics, using digital games and interactive platforms for instance, Kahoot, Wordwall, or Quizizz, as alternatives to traditional lecture-based instruction; (iii) critical reflection on the teaching role in the face of technology: a portion of the projects proposes the analysis of teacher education in light of contemporary digital demands. A striking example is the use of artificial intelligence in Geography teaching, which highlights ethical and pedagogical questions regarding teaching practice mediated by automated tools.

These themes show that students are attentive to both the practical challenges and the theoretical and critical dimensions of technology use in the classroom, in addition to proving that

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preservice teachers not only experimented with tools but also sought to ground the pedagogical use of DICTs with intentionality and critical sense. The study developed by Peres, Rodrigues, and Silva (2023), for example, presents as results that the use of technology in education, with resources in the classroom, stimulates creativity, logical reasoning, collaboration, research capacity, and other important competencies for the contemporary world that are essential for understanding trends and developing skills for the future.

5.4 Main Debates Promoted

The projects are not limited to describing the use of technological resources. In many cases, preservice teachers propose broader discussions on pedagogical intentionality, student engagement, access barriers, and the role of the teacher as a mediator of educational processes mediated by DICTs. Also noteworthy are reflections on digital inclusion, the importance of pedagogical authorship, and the need to adapt traditional practices to new learning contexts, especially in schools with infrastructure constraints.

Furthermore, the analyzed projects prompt discussions on the conscious use of technologies in the school context, demonstrating the intentionality behind the use of DICTs and their relationship with learning objectives. Added to this are the possibilities and limits of technologies in the development of student autonomy and the ethical impacts of using artificial intelligence in knowledge mediation. In this process, even though the use of technology is the starting point, the analyzed works show that the central concern lies in ensuring meaningful learning experiences that are contextualized and connected with students' real demands, as well as the need for continuing education for the effective use of digital resources.

5.5 Challenges and Contributions Identified

The analysis of the projects made it possible to identify recurring challenges faced by preservice teachers during the process of designing activities, namely: insecurity among teachers and students when facing digital tools that are still unfamiliar; precarious infrastructure in some schools, including a lack of devices and internet connectivity; and the need to rethink pedagogical approaches when introducing DICTs. Despite this, the projects, in general, highlight important pedagogical gains,

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such as the stimulation of teaching creativity with innovative proposals tailored to the school context; greater student participation in interactive activities; the expansion of student autonomy, especially in projects that encourage research and authorship; and the development of digital competencies that go beyond the technical use of tools, involving critical analysis and didactic adaptation.

These elements demonstrate that Integrative Projects contribute to an education that moves beyond the instrumental mastery of technology, reinforcing its pedagogical role. In this sense, the approach provided by Univesp aligns with what is advocated in recent research by authors such as Leal (2025) and Costa and Valério (2022), by understanding that this type of education prepares future teachers for the exercise of a conscious, critical pedagogical praxis adapted to contemporary demands.

6 FINAL CONSIDERATIONS

The present study aimed to understand how Univesp's Integrative Projects have promoted the articulation between educational technologies and initial teacher education, based on the document analysis of preservice teachers' academic productions. The investigation revealed that, more than a curricular requirement, the use of Digital Information and Communication Technologies (DICTs) constitutes a fertile field for pedagogical experimentation, the building of digital competencies, and the development of a reflective and critical stance regarding the role of the teacher in contemporary society.

The analyzed projects made evident that, even when facing challenges, such as limitations in school infrastructure and the need for continuing education, preservice teachers have sought to integrate DICTs into innovative and socially relevant pedagogical proposals. Such a movement points toward an education that values teacher agency and redefines the use of technologies as instruments of social emancipation and transformation. In contrast, this study acknowledges the limitations inherent to the research, particularly regarding the restriction of the analysis to the works available in the institutional repository, without encompassing the entirety of the experiences lived by the preservice teachers.

In addition, the absence of complementary qualitative data, such as interviews or questionnaires, restricted a deeper understanding of the individual perceptions and reflections of the projects' authors. Even so, the results obtained allow us to state that the Integrative Project plays a relevant role in initial teacher education by providing learning spaces that link theory and practice,

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enhance peer collaboration, and encourage the creation of educational solutions aligned with the demands of contemporary education.

Within an institution with a fully distance-learning educational model, Integrative Projects represent one of the main strategies for linking theory and practice. By challenging students to develop proposals applied to school reality, even if remotely, IPs create active, collaborative learning spaces focused on solving real-world problems.

In Univesp's distance education model, Integrative Projects play a fundamental role in linking theory and practice. Through proposals that require tackling real-world challenges, preservice teachers have the opportunity to engage in dialogue with school reality, promoting situated teacher education. In this way, IPs establish the connection between the virtual learning environment and the concrete spaces of basic education, expanding the formative reach of distance learning and fostering meaningful interactions among the actors involved.

This structure enables the preservice teacher to act as the subject of their own learning, breaking away from the idea that distance learning is limited to the consumption of recorded content. On the contrary, the IP provides opportunities for dialogue with the school, the community, and peers, stimulating critical reflection and the joint construction of educational solutions.

Based on the analysis of the 18 selected works, two main directions were identified that guide the presentation and discussion of results in scientific inquiries regarding IPs: (i) the historical and normative context of technology use in education, which underpins the understanding of the place of DICTs in teacher education; and (ii) the characterization of educational technologies as pedagogical tools that drive the development of professional competencies among future teachers. It is, therefore, a field of interest still in a seminal state, in whose nuances regarding the integration of DICTs into the formative process through IPs other factors may be revealed to be scientifically contextualized, as was attempted in this paper.

For future research, it is recommended to expand the investigation using methodologies that make it possible to access other dimensions of the formative experiences, such as the motivations, difficulties, and expectations of preservice teachers regarding the use of technologies in their pedagogical practice. Furthermore, it would be pertinent to explore in greater depth the role of facilitators and advisors in the formative process, as well as to evaluate the concrete impacts of the Integrative Projects on the daily routine of the schools involved.

Finally, this study reinforces the importance of understanding educational technologies not

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merely as technical resources, but also as structural elements of pedagogical practice and teacher professional identity. It is hoped that this research contributes to fostering reflections and debates on initial teacher education, inspiring the construction of educational proposals that, with sensitivity and social commitment, make technology an ally in promoting a more critical, humanizing, and transformative education.

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