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Teacher Training On The Use Of Active Methodologies And Technologies: Impacts On Teaching And Learning

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Abstract:
Teacher training focused on the use of active methodologies and digital technologies has been widely debated in the educational field, given the social and cultural transformations affecting contemporary schools. This work, developed through an integrative literature review, analyzed scientific productions that address initial and continuing training programs aimed at incorporating these approaches in the school context. The discussions indicate that training processes articulated with pedagogical practice contribute to the revision of traditional teaching conceptions, expanding student protagonism and encouraging investigative, collaborative, and contextualized practices. The integration between active strategies and digital resources expands didactic possibilities, diversifies languages, and strengthens student participation. Aspects related to institutional infrastructure, collaborative culture in schools, and the need for continuous training are also highlighted. The analysis points out that teacher qualification constitutes a strategic element for the consolidation of participatory pedagogical practices capable of engaging with current educational demands. Investments in structured training and pedagogical support favor the reorganization of teaching work and the expansion of learning experiences, promoting more interactive and reflective teaching.

Key Word: *Teacher training; Active methodologies; Digital technologies.*

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I. Introduction

Teacher training has occupied a central place in educational discussions in light of the social, cultural, and technological transformations affecting contemporary schools. The incorporation of active methodologies and digital resources modifies established pedagogical practices and leads to reorganizations in planning,

knowledge mediation, and learning assessment. In this context, preparing teachers to work with participatory and technology-mediated proposals becomes a recurring issue in academic debates. [1,8,10].

Active methodologies shift the focus from content transmission to processes that value student participation in knowledge construction. Strategies such as problem-based learning, projects, case studies, and flipped classrooms stimulate reflection, investigation, and intellectual autonomy. The presence of digital technologies expands possibilities for interaction, access to information, and collaborative production, transforming the school space into a more interactive environment connected to social reality [3].

Teacher training focused on these approaches requires a review of pedagogical concepts and technical mastery of technological resources. It is not simply a matter of inserting digital tools into the school routine, but rather of understanding how to integrate them into the curriculum in a way that is consistent with pedagogical principles that value the active participation of the student. This movement implies critical reflection on traditional practices and openness to ongoing formative experiences [2,10].

The use of technology in education, combined with active methodologies, can expand learning opportunities, diversify teaching strategies, and strengthen communication between teachers and students. Virtual platforms, collaborative environments, and multimedia resources contribute to broadening repertoires and languages, favoring more contextualized learning paths. This integration, when accompanied by consistent training, tends to have an impact on the quality of pedagogical experiences [3,5,10].

However, the implementation of these proposals requires institutional support, adequate material conditions, and opportunities for ongoing professional development. Teachers need time for planning, exchanging experiences, and collectively reflecting on pedagogical practices. The absence of these elements can lead to insecurity, superficial use of technologies, and the reproduction of traditional methods with new tools [2,4,7].

The incorporation of active methodologies articulated with digital technologies also interacts with changes in the profile of students, who daily interact with multiple languages, information networks, and interactive resources. This context demands pedagogical practices that establish connections between the school curriculum and experiences lived outside of school. Teacher training, in this scenario, needs to include a critical analysis of digital cultures and contemporary forms of knowledge production and circulation [6,9].

Another relevant aspect concerns the construction of more collaborative learning environments. Active methodologies, supported by technological resources, expand possibilities for group work, co-authorship, and the exchange of ideas. Teachers prepared to lead these proposals tend to organize didactic situations that stimulate dialogue, listening, and respect for the different perspectives present in the classroom, strengthening bonds and promoting broader student participation [7].

It is also important to highlight that teacher training focused on these approaches needs to consider the diversity of educational contexts existing in the country. Distinct school realities, with different levels of access to technological resources, require planning sensitive to local conditions. Training processes that value contextual analysis and adaptation of strategies contribute to teachers developing practices consistent with their institutional possibilities, without losing sight of participatory and reflective pedagogical principles [1,9].

Given this context, it becomes relevant to analyze scientific productions that discuss teacher training for the use of active methodologies and technologies, investigating how such training processes impact teaching and learning. Understanding these aspects contributes to the improvement of training policies and programs, strengthening pedagogical practices aligned with current educational demands[11,12].

The overall objective of this study is to analyze, through an integrative literature review, the contributions of teacher training focused on active methodologies and digital technologies, examining their repercussions on teaching and learning processes.

II. Materials And Methods

This is a qualitative study, developed through an integrative literature review, a modality that allows for the gathering, organization, and analysis of scientific productions on a given theme, offering a comprehensive view of the knowledge produced. This methodological strategy allows for the identification of investigative trends, predominant theoretical frameworks, gaps in the field of study, and contributions to educational practice. The process was outlined based on previously defined stages, including the formulation of the guiding question, the establishment of inclusion and exclusion criteria, the definition of databases, and the planning of search strategies.

The guiding question was constructed based on the following problem: what contributions does teacher training focused on active methodologies and digital technologies offer to teaching and learning processes? From this definition, descriptors related to teacher training, active methodologies, educational technologies, teaching, and learning were selected. Combinations with Boolean operators were used, broadening the sensitivity of the search and ensuring a wider reach of scientific productions relevant to the topic.

The searches were conducted in national and international databases in the field of Education, encompassing articles published in peer-reviewed scientific journals. A defined time frame was established,

including studies available in full text, in Portuguese, English, and Spanish. Duplicate works, abstracts without full text, productions that did not directly address the investigated theme, and studies whose focus was not related to teacher training articulated with the use of active methodologies and technologies were excluded.

After identifying the studies, the titles and abstracts were read, followed by a full reading of the selected productions. The extracted data were organized into an instrument developed by the researchers, containing information on authorship, year of publication, objectives, methodological design, context of the study, target audience, and main findings. This organization allowed for comparison between the studies and the construction of thematic categories for analysis.

The data analysis was conducted in an interpretive and comparative manner, seeking to identify convergences, divergences, and specificities in the examined productions. The constructed categories encompassed aspects such as conceptions of teacher training, training strategies adopted, integration between active methodologies and digital technologies, and repercussions observed in teaching and learning processes. This procedure allowed for a deeper understanding of the contributions presented in the literature.

During the analytical process, methodological limitations described in the studies themselves were also considered, such as sample size, follow-up time of the formative experiences, and specific institutional contexts. Critical analysis of these elements contributed to a more consistent evaluation of the body of work, avoiding generalizations and allowing for a contextualized reading of the findings.

The integrative synthesis was constructed from the articulation between the identified thematic categories and theoretical frameworks in the educational field, enabling a broader discussion on teacher training for the use of active methodologies and technologies. The methodological approach adopted sought to ensure rigor in the selection and analysis of the productions, favoring the elaboration of a consistent synthesis aligned with the proposed objectives.

III. Results And Discussion

The analyzed productions highlight that teacher training oriented towards active methodologies promotes a profound revision of traditional teaching conceptions. Teachers begin to question practices centered on oral exposition and the reproduction of content, reflecting on the need to reorganize time, space, and teaching strategies. This formative movement contributes to shifting the focus from the simple transmission of information to processes in which the student assumes a participatory position, constructing knowledge through investigation, problematization, and dialogue. This reconfiguration interferes with the teacher's own professional identity, which begins to incorporate more collaborative and reflective practices [3,10].

Another recurring aspect in the publications refers to the articulation between theory and practice in continuing education programs. Studies indicate that training initiatives that combine conceptual grounding with classroom experimentation tend to generate more consistent changes in pedagogical practices. Teachers who experience active methodologies during their own training demonstrate a greater understanding of their assumptions and a greater willingness to apply them in real-world contexts. Practical experience accompanied by moments of collective reflection contributes to consolidating professional learning and strengthening confidence in the use of these approaches [6,7].

Regarding digital technologies, it is observed that their integration into education gains greater consistency when associated with well-defined pedagogical proposals. The simple insertion of technological resources, without planning articulated with the curriculum, tends to reproduce expository methods with new tools. In contrast, training that discusses pedagogical intentionality and criteria for choosing resources allows for a more coherent use of technologies, expanding languages, promoting interaction, and encouraging original production on the part of students [3,10].

The literature also highlights the relevance of the institutional context in consolidating these practices. Schools that offer adequate infrastructure, access to digital devices, and a stable internet connection present more favorable conditions for the implementation of innovative proposals. Spaces for collective planning and a collaborative culture among teachers strengthen the exchange of experiences and the shared construction of pedagogical solutions. Institutional environments that value continuing education tend to stimulate greater teacher engagement in the adoption of active methodologies mediated by technology [12].

Another point debated concerns the gaps present in initial teacher training. In several undergraduate courses, contact with active methodologies and technologies occurs in a fragmented way, restricted to specific subjects. This configuration can hinder the consistent appropriation of these approaches throughout the training trajectory. The transversal incorporation of these themes in undergraduate studies expands possibilities for practical experience and critical reflection, contributing to a more consistent preparation of future teachers [4,11].

The productions analyzed also discuss the repercussions of these training programs on learning. Strategies such as interdisciplinary projects, problem-solving, and the production of digital content broaden student participation and stimulate analytical, argumentation, and collaborative skills. The use of virtual learning

environments favors closer monitoring of activities, diversification of assessment instruments, and expansion of interaction spaces. These elements are described as factors that enrich educational experiences [2,6].

Another element present in the discussions refers to the professional autonomy of teachers. Training processes that encourage research on their own practice and critical reflection strengthen the ability to adapt to the specificities of each school context. Teachers begin to develop more contextualized proposals, linking curricular content to the realities experienced by students. This reflective stance contributes to the construction of pedagogical practices that are more consistent with participatory principles [7,9].

It is also observed that the consolidation of these approaches requires continuity and pedagogical support. One-off training sessions, without connection to daily school life, tend to produce superficial changes. Programs that include monitoring of experiences, moments of collective evaluation, and adjustments to strategies demonstrate greater potential for transforming practices. The presence of an active pedagogical coordinator is a relevant element in this process [10].

The literature also addresses the transformations in learning assessment resulting from the adoption of active methodologies articulated with digital technologies. Teachers in training are rethinking traditional assessment instruments, incorporating practices such as digital portfolios, self-assessment, peer assessment, and process-based monitoring of activities. This change broadens the understanding of assessment as an integral part of the training process, valuing the development of skills, participation, and student engagement throughout the proposed experiences [1,7,9].

Another aspect discussed refers to the expansion of teachers' digital literacy. Training focused on the pedagogical use of technologies helps teachers develop skills related to the critical selection of resources, content curation, and the organization of virtual learning environments. This process strengthens professional autonomy and reduces dependence on ready-made models, encouraging the creation of proposals aligned with the specificities of each class and school context [4,6].

The productions also highlight the need for cultural change in educational institutions. The incorporation of active methodologies and technologies demands openness to experimentation, tolerance for error, and a willingness to revise established routines. In contexts where a rigid and centralized school culture prevails, the implementation of these proposals tends to face resistance. Environments that value dialogue, collaboration, and continuous training are more likely to consolidate innovative practices [3,5].

Another recurring point in the analyses refers to the relationship between teacher training and educational equity. The planned use of technologies can broaden access to different sources of information, diversify languages, and accommodate different learning styles. Training programs that address digital inclusion and the adaptation of pedagogical strategies contribute to building more accessible experiences that are sensitive to the differences present in the school environment, strengthening the participation of all students in the educational process [8].

The discussions also highlight the importance of the ethical dimension in the use of educational technologies. Teacher training needs to address topics such as data protection, responsible use of digital networks, combating misinformation, and respect for intellectual authorship. By developing critical awareness of these aspects, teachers become more attentive mediators to the social implications of technology use, guiding students towards responsible and reflective practices in the digital environment [1,3].

IV. Conclusion

An analysis of scientific publications on teacher training focused on active methodologies and digital technologies reveals that such training processes contribute to redefining pedagogical practices and reorganizing teaching work. By promoting critical reflection on traditional conceptions of teaching, this training broadens the teacher's understanding of their role as a mediator of knowledge, encouraging proposals that value investigation, participation, and collective construction. This movement has repercussions on the configuration of classes, the selection of teaching strategies, and the way learning is monitored and evaluated.

The studies examined demonstrate that training programs linked to daily practice have a greater potential for transformation. Experiences that integrate theoretical foundations, methodological experiences, and moments of reflective analysis strengthen professional confidence and broaden pedagogical repertoires. Teachers who participate in continuous training processes tend to develop a more investigative approach, reviewing their own practices and adapting strategies to the characteristics of their school contexts.

The consolidation of the use of active methodologies mediated by technology is also related to the institutional conditions and organizational culture of schools. Environments that promote collaboration among teachers, offer adequate infrastructure, and encourage collective planning create a more favorable scenario for the implementation of innovative proposals. Investments in initial and continuing training, accompanied by pedagogical support, constitute a relevant path for strengthening these practices.

Another relevant aspect concerns the expansion of learning possibilities provided by the integration of active methodologies and digital resources. The diversification of languages, the creation of virtual interaction

environments, and the valuing of student authorship contribute to more participatory and contextualized formative experiences. These elements indicate that teacher training plays a strategic role in promoting practices that engage with contemporary reality.

It is also observed that the continuity of training actions and the systematic monitoring of implemented experiences are factors that influence the sustainability of pedagogical changes. Isolated or one-off processes tend to produce superficial changes, while structured, long-term programs favor the consolidation of innovative practices. The articulation between educational policies, school management, and teacher training represents a promising path for improving teaching and strengthening learning in different educational contexts.

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