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Didactic processes in teachers and their impact on learning: a systematic review

Procesos didácticos en los docentes y su impacto en los aprendizajes: una revisión sistemática

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Abstract

The present study aimed to analyze the implications of the didactic processes implemented by teachers and their impact on learning. To this end, a systematic review was conducted using the PRISMA methodology, selecting articles published between 2020 and 2025 in the Scopus and Scielo databases, using keywords in Spanish and English such as "didactic processes" AND "teachers." Only open-access articles were included, excluding paid articles, as well as books, conferences, and theses. After applying the inclusion and exclusion criteria, 10 relevant articles were identified in Scopus and 91 in Scielo; of these, 5 from Scopus and 16 from Scielo were analyzed in depth, totaling 21 studies. The results show that teacher training requires critical reflection aimed at strengthening the understanding and application of innovative teaching resources. The implementation of innovative strategies is identified as key to the development of students' critical thinking, autonomy, and collaborative work. Likewise, both teachers and educational institutions must embrace conscious teaching, fostering continuous improvement in initial and ongoing teacher training. The integration of components such as autonomy and connection to the social and professional environment emerges as essential to raising the quality of the teaching-learning process. Finally, the need to include training in technological tools and subject-specific strategies is highlighted, as their proper application positively impacts learning outcomes.

Keywords: learning, teaching, strategies, didactic processes.

Resumen

El presente estudio tuvo como objetivo analizar las implicancias de los procesos didácticos implementados por los docentes y su impacto en los aprendizajes. Para ello, se realizó una revisión sistemática bajo la metodología PRISMA, seleccionando artículos publicados entre 2020 y 2025 en las bases de datos Scopus y Scielo, utilizando palabras clave en español e inglés como "*didactic processes*" *AND* "*teachers*". Se incluyeron únicamente artículos de acceso abierto, excluyéndose aquellos de pago, así como libros, conferencias y tesis. Tras la aplicación de los criterios de inclusión y exclusión, se identificaron 10 artículos relevantes en Scopus y 91 en Scielo; de estos, se analizaron en profundidad 5 de Scopus y 16 de Scielo, sumando un total de 21 estudios. Los resultados evidencian que la formación docente requiere una reflexión crítica orientada a fortalecer la comprensión y aplicación de recursos didácticos innovadores. La implementación de estrategias novedosas se identifica como clave en el desarrollo del pensamiento crítico, la autonomía y el trabajo colaborativo de los estudiantes. Asimismo, tanto docentes como instituciones educativas deben asumir una enseñanza consciente, favoreciendo la mejora continua en la formación inicial y permanente del profesorado. La integración de componentes como la autonomía y la relación con el ámbito sociolaboral emerge como esencial para elevar la calidad del proceso de enseñanza-aprendizaje. Por último, se resalta la necesidad de incluir la formación en herramientas tecnológicas y estrategias específicas por área, ya que su correcta aplicación incide positivamente en los logros de aprendizaje.

Palabras clave: aprendizaje, enseñanza, estrategias, procesos didácticos.

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Introduction

In educational processes, the interactions between teachers and students hold fundamental importance. For this reason, there is an observed increase in the presence of visual, kinesthetic, and nature-based experiences. This trend carries significant implications for environmental learning and education related to the natural environment. In this regard, it is essential to conduct a systematic review that examines how the scientific literature addresses the impact of bodily experiences on the connection to nature and environmental learning (Gray et al., 2025).

On the other hand, the quality of teaching and learning processes is crucial for improving students' academic outcomes. Beyond the selection of resources, various external and internal factors influence student performance. External factors include school infrastructure, the teaching staff, learning processes, and the family environment. Meanwhile, internal factors encompass aspects such as health, intelligence, talent, interests, and motivation, which also affect learning effectiveness (Metekohy et al., 2022).

It is important to highlight that the improvement of teaching is an essential responsibility of educators. From the onto-semiotic approach, the category of didactic suitability emerges as a valuable tool for guiding the design, implementation, and evaluation of study processes through general indicators. However, these indicators must be tailored to specific content areas. Several studies have proposed particular criteria for topics such as limits, probability, functions, and statistics, evidencing the need for a systematic review that explores how these criteria have been developed and applied in the literature (Verón et al., 2024).

Furthermore, educational processes should be conceived as a continuous dynamic that requires collaborative work. In particular, it is essential that students with cognitive deficits learn integrated with their peers, without their personal, social, or cultural conditions constituting barriers. In this context, there is an urgent need to systematically review how the literature addresses inclusive pedagogical practices that contribute to closing gaps and enhancing the school experience for these students (Martínez-Cuaspud et al., 2024).

Despite the implementation of introductory courses to strengthen skills such as reading and writing, these efforts have proven insufficient, as the roots of the problem lie in the early stages of formal education. Therefore, a systematic analysis is necessary to examine how the literature addresses the comprehensive development of academic writing from a holistic educational perspective (Jara, 2021).

Specifically, in Peru, many institutions exhibit deficiencies in the application of didactic processes, a situation that negatively impacts student learning. This reality is related to a lack of clarity and commitment in teaching certain areas, which justifies a systematic review analyzing how the literature addresses these processes and their implications for learning achievements (Roque et al., 2022).

Considering all of the above, this study aims to answer the following question: What are the implications of didactic processes on teachers and their impact on learning outcomes? In line with this inquiry, the main objective of the study is to analyze the effect that these processes have on both teacher performance and the educational results achieved.

Methodology

To conduct this systematic review, the PRISMA methodology was employed, recognized for its rigorous criteria suitable for such studies. Regarding inclusion criteria, publications indexed in the Scopus and Scielo databases from the period 2020-2025 were considered. The search was conducted using keywords in both English and Spanish, such as "didactic processes" and "teachers," combined with Boolean operators AND to optimize the selection of relevant articles. On the other hand, exclusion criteria eliminated closed-access articles, publications prior to 2020, paywalled articles, as well as books, conference papers, and theses.

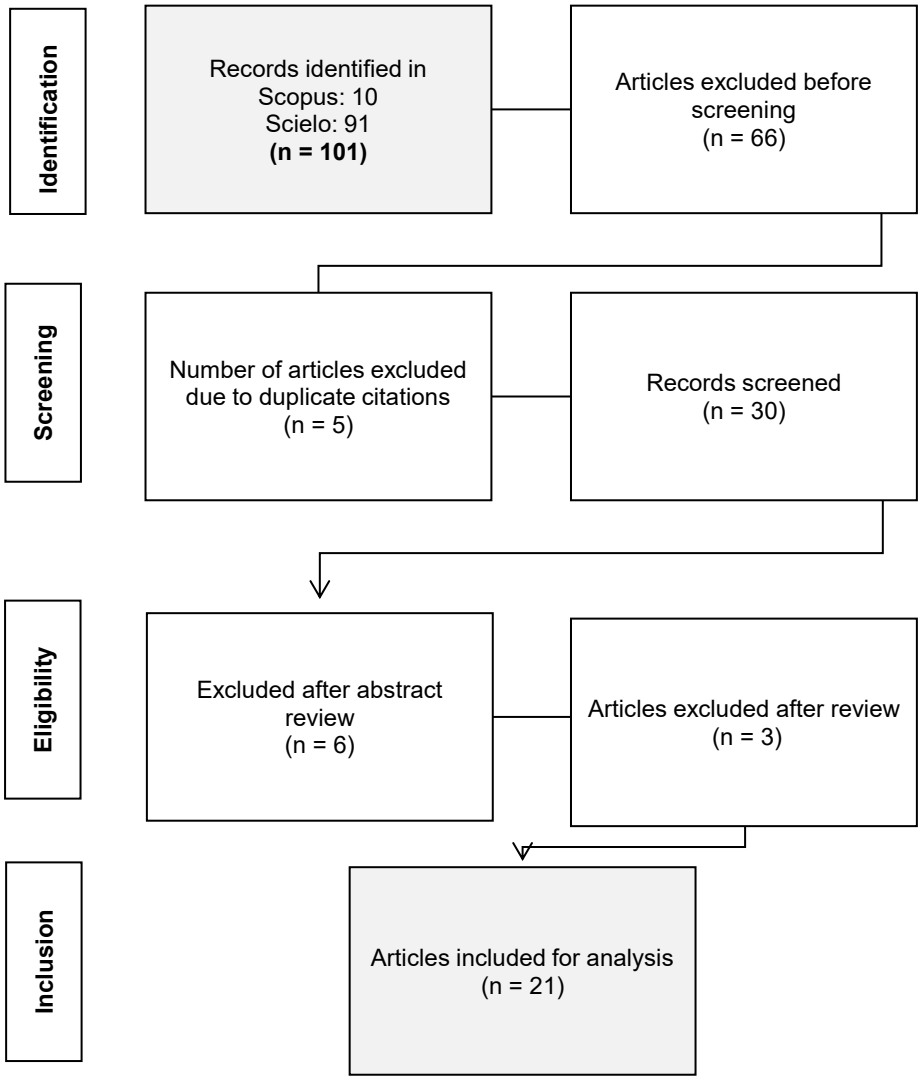
The initial results yielded a total of 101 articles from both databases, with 10 from Scopus and 91 from Scielo. After the selection and analysis process, 5 articles from Scopus and 16 from Scielo were prioritized, resulting in a final sample of 21 studies considered for the presentation of results (see Table 1).

Table 1

Keywords used for the database search

Database	Search Term	Results	Selected
Scopus	“didactic processes” AND “teachers”	10	5
Scielo	“didactic processes” AND “teachers”	91	16
	Total	**101**	**21**

Figure 1
PRISMA flow diagram



Source. PRISMA format table with original data

Results

Table 2
Implications of didactic processes in teachers

No.	Authors	Didactic processes in teachers
1	Chavarría-Vásquez et al. (2024)	Teacher education should integrate mathematical modeling as a fundamental didactic strategy for developing skills that facilitate practical application in the classroom. It is essential that educational institutions include these processes in their curricula and train teachers in designing activities that connect mathematics with real contexts, thereby improving both comprehension and student interest.

2	Herrán-Gascón & Rodríguez-Herrero (2024)	Indoctrination contrasts with authentic education, making it crucial to distinguish between the two in educational practice. Egocentric systems can favor indoctrination, even when competency-based approaches are adopted. Therefore, it is essential for both teachers and institutions to promote conscious teaching, which directly impacts the initial and ongoing training of educators.
3	Cabrera-Figueredo et al. (2024)	The diagnosis revealed significant deficiencies in teachers' didactic management during contingency situations, especially in instrumental and attitudinal areas. This reality highlights the urgency of implementing strategies that strengthen teacher competencies and enable them to adapt effectively to changing contexts.
4	Lima & Zani (2024)	Transforming a written fable into a theatrical version requires specific adjustments, particularly the incorporation of non-linguistic elements, such as gestures and visual supports, which enhance the oral experience in the classroom. These findings provide valuable insights for developing multimodal pedagogical strategies that enhance teaching.
5	Cifuentes & Burgos (2023)	The proper use of technological tools is a key factor in encouraging self-formation among teachers, particularly in emergency contexts, as it promotes continuity and flexibility in the learning process.
6	Rayen et al. (2025)	Critical reflection, along with the use of writing devices, plays a fundamental role in teacher training to improve understanding and application of didactic resources, promoting continuous professional growth.
7	Manrique & López (2023)	The application of appropriate didactic strategies in mathematics education strengthens students' cognitive abilities and enhances the quality of learning, promoting a more conscious, active, and effective approach.
8	Mora-Vicarioli et al. (2023)	Well-designed virtual environments optimize academic and administrative management in massive courses, facilitate personalized student support, and allow flexible use of didactic resources that enrich learning.
9	Klimenko et al. (2023)	Student creativity is enhanced when teachers implement strategies that stimulate divergent thinking and employ open evaluation methods. This underscores the need to replace memorization approaches with innovative and creative pedagogical models.
10	Rojas (2023)	The inclusion of psycholinguistics content and analysis of specific discourse genres in teacher training strengthens textual competence and elevates the quality of the educational process.
11	Piñeiro (2023)	The incorporation of innovative didactic techniques stimulates critical thinking, autonomy, and collaborative work in teacher training. Additionally, interdisciplinarity and shared learning enrich the educational process.
12	García & Diez-Palomar (2023)	Teacher reflection allows for recognizing the importance of integrating previously undervalued didactic components, such as autonomy and links to the socio-laboral environment, to enhance the quality of teaching-learning processes.

13	Neto & de Souza (2023)	The TOPAS simulator, based on the Monte Carlo method, is presented as an effective didactic strategy for teaching Radiation Physics in Medical Physics courses in Brazil. Its use energizes learning, facilitates understanding of complex concepts, and fosters student interest through interactive and contextualized simulations, supporting both teachers and students in deepening content.
14	Pou (2023)	This study highlights the potential of university radio, integrated into digital culture, as a powerful educational tool. From the teachers' perspective, its use promotes the development of didactic skills, such as content synthesis, interdisciplinary work, and the production of multimedia formats like podcasts, facilitating meaningful learning and giving radio a relevant political and pedagogical role in digital environments.
15	Ávila (2023)	The confinement caused by COVID-19 in Mexico profoundly transformed mathematics education, highlighting the need for greater teacher training to address distance education. During this period, frontal teaching intensified, and content was simplified, while external resources like tutorials and family support became essential elements. These changes altered traditional didactic relationships and limited the achievement of expected learning outcomes.
16	Quitián-Bernal & González-Martínez (2022)	The collaborative strategy for designing blended learning environments presents challenges but also great value for teacher training, as it fosters the development of essential didactic and technological competencies. Teamwork also requires specific training in positive interdependence, which contributes to improving the quality of pedagogical design and better prepares teachers for their professional practice.
17	Hizli et al. (2024)	The use of e-portfolios in teacher training promotes reflection and autonomous learning, functioning as pedagogical tools that support professional development. However, their implementation faces challenges that must be addressed to maximize their potential and avoid reducing them to mere information repositories.
18	Grönlund et al. (2021)	The reconciliation between school policies, formative ideals, the legitimization of grades, and the time allocated for feedback constitutes a crucial aspect that requires attention to improve educational quality.
19	Chrostowski (2024)	The increasing secularization in Poland challenges the effectiveness of traditional religious education, especially among younger generations. Social and educational challenges are identified that demand a renewal of the religious teaching model. In response, a dialogical and educational approach inspired by comparative models, such as the German model, is proposed to adapt religious education to the demands of a postmodern society.
20	Bengtsson & Lysgaard (2022)	Irony, beyond being a humorous resource, can become a valuable tool in teaching to reveal tensions and dilemmas present in teaching practice. This strategy allows for critically questioning rigid and automated approaches, promoting deep reflection on the formation of both educators and students. Thus, irony facilitates a more conscious and self-critical pedagogy in the face of pressures from saturated curricula and strict evaluations.

21	Guillén-Yparrea et al. (2023)	The accelerated incorporation of virtual platforms and simulations for learning and skill development, driven by the pandemic, is transforming traditional education with great effectiveness. These tools have gained increasing popularity, evidenced by the constant rise in users and online courses. Trends indicate that these strategies will continue to solidify as key elements in higher education training.

Importance of didactic processes in teachers

Teacher training requires deep critical reflection and the incorporation of writing devices to improve the understanding and application of didactic resources, which fosters educators' professional growth (Rayen et al., 2025). Moreover, integrating elements of psycholinguistics and analyzing specific discourse genres strengthens textual competence, significantly contributing to the quality of the didactic process (Rojas, 2023).

On the other hand, implementing innovative didactic techniques is fundamental for developing essential skills such as critical thinking, autonomy, and collaborative work. Interdisciplinarity and teamwork notably enrich the educational process and prepare teachers to face the complex challenges of their professional practice (Piñeiro, 2023). In this context, the use of e-portfolios emerges as a valuable pedagogical tool that promotes both reflection and autonomous learning, although its effectiveness will depend on overcoming certain challenges to avoid it becoming a mere information repository (Hizli et al., 2024).

Additionally, in teaching practice, it is essential to reconcile school policies, formative ideals, the legitimization of grades, and the time available for providing feedback, as all these elements directly impact didactic processes (Grönlund et al., 2021). Within this framework, irony can become a powerful pedagogical resource. Beyond its humorous function, this strategy makes visible the tensions and dilemmas inherent in teaching. By critically questioning rigid and automated approaches, irony promotes deep reflection on both teacher and student formation, thus facilitating a more conscious and self-critical pedagogy in the face of pressures from saturated curricula and strict evaluation systems (Bengtsson et al., 2022).

Factors impacting didactic processes in teachers

A determining factor in didactic processes is the difficulty in distinguishing between authentic education and indoctrination, especially in egocentric systems that may favor the latter, even under competency-based approaches. Therefore, it is essential for both teachers and institutions to adopt conscious teaching, which directly impacts the initial and ongoing training of educators (Herrán-Gascón et al., 2024).

The diagnosis conducted during contingency situations revealed significant deficiencies in teachers' didactic management, particularly in instrumental and attitudinal dimensions. This situation underscores the urgency of implementing strategies that strengthen their competencies and prepare them to adapt effectively to dynamic and changing contexts (Cabrera-Figueredo et al., 2024). Complementarily, teacher reflection highlights the importance of incorporating aspects such as autonomy and connections to the socio-laboral environment to improve the quality of the teaching-learning process (García et al., 2023).

Moreover, the impact of the COVID-19 lockdown in Mexico exposed factors affecting teaching, particularly in mathematics education. There was an intensification of direct teaching and a simplification of content, while external resources like tutorials and family support became crucial elements. These changes altered traditional didactic relationships and limited the achievement of expected learning outcomes, highlighting the urgent need for greater teacher training in distance education (Ávila, 2023).

In another context, the increasing secularization in Poland represents a challenge for the effectiveness of the traditional religious education model in schools, especially among younger generations. In light of this reality, there is a need to renew the approach to religious teaching through a dialogical and educational model, drawing on comparative experiences, such as the German model, to respond to the demands of a postmodern society (Chrostowski, 2024).

Finally, the pandemic accelerated the incorporation of virtual platforms and simulations for learning and skill development, transforming traditional education with high effectiveness and popularity. This advancement is reflected in the constant increase in users and online courses, and trends indicate that such strategies will continue to solidify as key tools in educational training (Guillén-Yparrea et al., 2023).

Strategies for didactic processes in teachers

For effective teacher training, it is fundamental to integrate specific didactic strategies that facilitate skill development and improve the quality of learning. For instance, including mathematical modeling in curricula and

teacher training allows for designing activities that connect mathematics with real contexts, increasing student comprehension and motivation (Chavarría-Vásquez et al., 2024). Along these lines, the appropriate use of didactic strategies in mathematics teaching strengthens students' cognitive abilities, fostering active and meaningful learning (Manrique et al., 2023).

The efficient handling of technological tools is a key element for teacher self-formation, especially in emergency contexts, as it promotes continuity and flexibility in learning (Cifuentes et al., 2024). Additionally, well-designed virtual environments optimize academic and administrative management in massive courses, facilitate personalized student support, and allow versatile use of didactic resources that enhance learning (Mora-Vicarioli et al., 2023).

Regarding student creativity, strategies that stimulate divergent thinking and use open evaluation methods highlight the need to move beyond traditional memorization approaches to adopt more innovative pedagogical models (Klimenko et al., 2023). The transformation of a written fable into a theatrical version exemplifies how incorporating non-linguistic elements, such as gestures and visual supports, enriches the oral experience and expands pedagogical modalities (Lima & Zani, 2024).

Moreover, the use of interactive simulators, such as TOPAS based on the Monte Carlo method for teaching Radiation Physics, represents an effective didactic strategy that energizes learning, facilitates understanding of complex concepts, and increases student interest through contextualized simulations (Neto & de Souza, 2023).

University radio, integrated into digital culture, is recognized as an educational tool with great potential. From the teachers' perspective, its use develops didactic skills in content synthesis, interdisciplinary work, and multimedia material production, giving radio significant political and pedagogical value in digital environments (Pou, 2023).

Finally, the collaborative strategy for designing blended learning environments presents certain challenges, but it is highly valuable for pre-service teachers. This modality fosters essential didactic and technological competencies, requiring specific training in positive interdependence, which improves the quality of pedagogical design and better prepares teachers for their professional practice (Quitián-Bernal et al., 2022).

Conclusions

The study concludes that teacher training must be grounded in deep critical reflection to optimize the understanding and application of didactic resources. In this sense, implementing innovative didactic techniques is essential for developing fundamental skills such as critical thinking, autonomy, and collaborative work.

Furthermore, it is imperative that both teachers and educational institutions adopt conscious teaching, as this stance directly influences the quality of initial and ongoing teacher training. Complementarily, teacher reflection reveals the relevance of integrating elements such as autonomy and connections to the socio-laboral environment, which are key to improving the quality of the teaching-learning process.

Additionally, training should consider the incorporation of specific didactic strategies that facilitate the development of competencies and elevate the quality of learning. In this context, efficient handling of technological tools is a fundamental aspect, especially for teacher self-formation in emergency situations, as it promotes continuity and flexibility in the educational process.

Finally, it is suggested to provide specific training for each knowledge area, as contextualized and specialized training has a direct and positive impact on student learning outcomes.

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