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Distance learning in initial teacher education and active methodologies: an integrative study in the international context

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Abstract

Introduction. Active methodologies are innovative pedagogical strategies that go beyond the traditional model by placing the student at the center of the learning process. Thus, this study aims to investigate what international scientific articles have shown regarding the contributions of active methodologies to initial distance teacher education. **Methodology.** To this end, an integrative review was conducted using a qualitative approach, of an exploratory and descriptive nature, with searches in the Education Resources Information Center, Scientific Electronic Library Online, Scopus, and Web of Science databases, covering the period from 2020 to 2024. The sample consisted of ten empirical articles, analyzed across three thematic categories**. Results.** The findings indicate that active methodologies are present in the analyzed manuscripts and promote the development of competencies such as autonomy, self-regulation of learning, teamwork, and critical-reflective thinking. **Discussion.** It is considered that active methodologies are important allies in the teaching and learning process in distance initial teacher education.

Keywords
initial teacher education; active methodologies; distance education; integrative review.

Formação inicial de professores a distância e metodologias ativas: uma investigação integrativa no cenário internacional

Resumo

Introdução. As metodologias ativas são estratégias pedagógicas inovadoras que superam o modelo tradicional ao colocar o estudante como protagonista do processo de aprendizagem. Assim, este estudo objetiva investigar o que os artigos científicos internacionais têm mostrado sobre as contribuições das metodologias ativas na formação inicial de professores a distância. **Metodologia.** Para tanto, foi realizada uma revisão integrativa com abordagem qualitativa, de caráter exploratório e descritivo, com buscas nas bases de dados Education Resources Information Center, Scientific Electronic Library Online, Scopus e Web of Science, no período de 2020 a 2024. A amostra constituiu-se de dez artigos empíricos, analisados em três categorias temáticas. **Resultados.** Os achados indicam que as metodologias ativas estão presentes nos manuscritos analisados e favorecem o desenvolvimento de competências como autonomia, autorregulação da aprendizagem, trabalho em equipe e pensamento crítico-reflexivo. **Discussão.** Considera-se que as metodologias ativas constituem importantes aliadas no processo de ensino e aprendizagem na formação inicial de professores a distância.

Palavras-chave
formação inicial de professores; metodologias ativas; educação a distância; revisão integrativa.

Formación inicial de docentes a distancia y metodologías activas: una investigación integrativa en el escenario internacional

Resumen
Introducción. Las metodologías activas son estrategias pedagógicas innovadoras que superan el modelo tradicional al situar al estudiante como protagonista del proceso de aprendizaje. De este modo, este estudio tiene como objetivo investigar lo que los artículos científicos internacionales han evidenciado sobre las contribuciones de las metodologías activas en la formación inicial de docentes a distancia. **Metodología.** Para ello, se realizó una revisión integrativa con enfoque cualitativo, de carácter exploratorio y descriptivo, a partir de búsquedas en las bases de datos Education Resources Information Center, Scientific Electronic Library Online, Scopus y Web of Science, en el período de 2020 a 2024. La muestra estuvo compuesta por diez artículos empíricos, analizados en tres categorías temáticas. **Resultados.** Los hallazgos indican que las metodologías activas están presentes en los manuscritos analizados y favorecen el desarrollo de competencias como la autonomía, la autorregulación del aprendizaje, el trabajo en equipo y el pensamiento crítico-reflexivo. **Discusión.** Se considera que las metodologías activas constituyen importantes aliadas en el proceso de enseñanza y aprendizaje en la formación inicial de docentes a distancia.

Palabras clave
formación inicial de docentes; metodologías activas; educación a distancia; revisión integradora.

1 Introduction

With the continuous advancement of digital information and communication technologies (DICTs), distance education (DE) has been occupying an increasingly prominent role in the Brazilian educational context. DLE, as we know it today, originated with Law No. 9,394, of December 20, 1996—the Law on Guidelines and Bases for National Education (LDBEN). Decree No. 5,622, dated December 19, 2005, in regulating Article 80 of the LDBEN, defines DLE as a teaching and learning process mediated by information and communication technologies, in which students and teachers engage in educational activities at different times and in different locations (Brazil, 2005).

In addition, distance learning has gained greater prominence, especially in teacher education programs, through initiatives such as Pró-Licenciatura (Brazil, 2018) and the

Open University of the State of Brazil (UAB) (Brazil, 2016). These initiatives aimed to promote the initial training of practicing teachers in public basic education, particularly in regions with a shortage of qualified professionals, and to expand access to higher education through distance learning for populations facing difficulties in accessing university education, respectively.

Among other factors, the growth of distance learning was driven by the enactment of Decree No. 9,057, dated May 25, 2017, which relaxed the rules for accrediting new campuses of institutions offering courses in this mode of instruction. In this context, public and private institutions significantly increased the number of enrollments in distance learning courses. According to the 2025 Map of Higher Education in Brazil, courses such as Education and Bachelor's degrees in Language and Literature are among the most sought-after in this modality (Instituto Semesp, 2025).

Another relevant aspect of the educational landscape concerns methodological approaches. In this study, we will emphasize active methodologies that have established themselves as innovative pedagogical strategies, as they break with the traditional, teacher-centered model of education (Filatro; Cavalcanti, 2018). From this perspective, students actively participate in the learning process, constructing knowledge individually and collectively, with the teacher assuming the role of mediator, stimulating students' curiosity, who, in turn, take the lead in their own learning (Blaszko; Claro; Ujiie, 2021).

In this sense, distance education, facilitated by the use of ICTs, combined with active methodologies, can offer important contributions to the development of fundamental competencies and skills for students in courses in this modality. Since a significant portion of this audience is involved in the context of initial teacher education, it is essential that studies be conducted to contribute to the discussion of this scenario.

Given this overview, several key questions arise: Are active methodologies being applied in distance learning programs for initial teacher education? What contributions can these strategies offer to future teachers? What are the challenges involved in implementing these practices in the context of distance learning?

To explore these questions, this article presents an integrative literature review aimed at investigating what international scientific articles have shown regarding the contributions of active methodologies to distance initial teacher education.

2 Methodology

This study consists of an integrative review with a qualitative approach, of a descriptive and exploratory nature, conducted within the context of the first author's academic master's research under the supervision and co-supervision of the second and third authors, respectively. According to Botelho, Cunha, and Macedo (2011), literature reviews can be classified, initially, into narrative and systematic reviews. Systematic literature reviews, in turn, are subdivided into meta-analysis, systematic review, qualitative review, and integrative review. The same authors define that the main objective of an integrative review is to enable the synthesis of previously published materials, allowing for the construction of new knowledge.

To conduct this study, we followed the six steps proposed by the authors for conducting an integrative review, which are described in Table 1.

Table 1 – Steps involved in the integrative review

Step	Actions
1	The research topic and research question are identified. In this stage, the search terms, databases, and search strategy are also selected, and the research problem is defined.
2	Inclusion and exclusion criteria are defined, and the search is conducted using the defined criteria.
3	Studies are organized and selected based on a review of titles, abstracts, and keywords.
4	The selected studies are read and categorized. In this step, the information extracted from the articles is summarized and documented, both regarding methodology and results.
5	The analyzed texts are discussed.
6	A synthesis of the knowledge is presented through the writing of a paper that describes in detail the steps taken in a thorough manner, presenting the results obtained.

Source: Adapted from Botelho, Cunha, and Macedo (2011).

Thus, in the first stage of the study, the following research question was formulated: What have international scientific articles revealed about the contributions of active methodologies in distance teacher education courses? The search for articles was conducted between April and May 2025 in four databases: Education Resources Information Center (ERIC), Scientific Electronic Library Online (SciELO), Scopus, and Web of Science. These databases were chosen for their recognized academic relevance and rigor in journal selection,

which facilitates the identification of high-impact studies, as well as for their comprehensive indexing of scientific publications in the field of education within an international context. To select the articles, search terms and Boolean operators were applied to the title, abstract, and keyword fields. Terms related to active methodologies included *"active* learning" *OR "active* methodologies" *OR "student-centered learning*." The descriptors referring to teacher education were: *"teacher* education" *OR "teacher* training" *OR "teacher* preparation"; as for terms associated with distance *education*: *"distance* education" *OR "online* learning" *OR* "e-learning" were used. Thus, the choice of descriptors and keywords was guided by the need to encompass the main concepts underpinning the research question, covering different terminologies used in the international literature. This initial search yielded 220 articles.

In the second stage, the authors collaboratively defined the inclusion criteria, namely: empirical, open-access articles published between 2020 and 2024. Based on these criteria, the search yielded a selection of 52 articles to be analyzed.

Next, we also defined the exclusion criteria: articles that did not address initial teacher education, studies that did not address active methodologies or the skills and competencies promoted by them, studies duplicated across databases, and research addressing distance learning in the context of emergency remote teaching, adopted during the COVID-19 pandemic as an alternative to maintain the academic calendar, given the impossibility of conducting in-person classes, as we understand that, under these circumstances, emergency remote teaching cannot be considered distance learning, which is planned and structured for that specific purpose.

In the third stage, we organized the selected articles into spreadsheets extracted from the databases, applying the exclusion criteria after reviewing the titles, abstracts, and keywords. As a result, we excluded 19 articles that did not fit within the theme of initial teacher education. Next, we excluded 11 texts because they dealt with emergency remote teaching and not necessarily distance education. We excluded another two studies because they did not address active methodologies or the skills and competencies promoted by them; another ten were excluded from the final selection because they were duplicates, resulting in ten articles for analysis.

In Table 2, we present a systematic overview of the process of including and excluding the articles that comprise this review, as described above.

Table 2 – Sample of articles found

Databases					Articles	Referrals
Stages	**Eric**	**Scielo**	**Scopus**	**WOS**	**Total**	**Selection of articles**
Inclusion criteria	122	2	57	39	220	Articles containing the descriptors in the title, abstract, or keywords.
	35	1	37	28	101	Articles published between 2020 and 2024.
	31	1	22	24	78	Empirical articles.
	15	1	19	17	52	Open-access articles.
52 articles selected for review of title, abstract, and keywords						
Exclusion criteria	5	0	18	10	33	Articles that do not deal with initial teacher training.
	4	0	14	4	22	Articles addressing distance learning in the context of emergency remote education.
	2	0	14	4	20	Articles that do not deal with active methodologies or related competencies and skills.
	1	0	5	4	10	Duplicate items.
Ten articles were selected for full-text reading.						

Source: Author's own work (2025).

In the fourth stage, we read and summarized the ten selected articles and compiled the information that makes up the final analysis spreadsheet. We then selected data regarding the field of knowledge, course, approach, context, active methodologies mentioned, research strategies, research gaps, results, conclusions, instruments for both data collection and analysis, future perspectives, and country of origin.

3 Analysis

Based on the reading and organization of the selected articles, we were able to identify recurring themes that helped group the studies into three main categories. These categories reflect the different approaches adopted in the research and allow us to understand how the international literature has addressed the relationship between active methodologies and initial distance teacher education. To clarify this organization, we

created a table (Table 3) with the articles grouped according to their central themes, which provides an overview of the analyzed material and the approaches taken by each study.

Table 3 – Categorization of the selected studies

(continued)

Categories of analysis	Code	Authors and titles of the articles selected for the integrative review
Teacher training and distance learning	A1	ÖZÜDOĞRU, Melike. Pre-service teachers' perceptions related to the distance teacher education learning environment and community of inquiry
	A2	MORRISON, Laura; JACOBSEN, Michele. The role of feedback in building teaching presence and student self-regulation in online learning
	A3	MOSQUERA GENDE, Ingrid. Collaborative digital tools for the training of future teachers in an online university
Active and Distance Learning	A4	CHAKYARKANDIYIL, Nisha; PRAKASHA, G. S. Online cooperative learning: exploring perspectives of pre-service teachers after the pandemic
	A5	MOLINA-TORRES, María-Pilar. Flipped learning as a teaching method in the bilingual university classroom
	A6	SULLIVAN, Ayşegül Bayraktar; DEMIRHAN İŞCAN, Canay. Investigation of effective teaching according to pre-service teachers' views and their teaching methods
Active methodologies and teacher education	A7	RODRIGUES, Ana Luísa. Integrating digital technologies in accounting pre-service teacher education: A case study in Portugal
Active methodologies and teacher training	A8	KREIS, Yves; HAAS, Ben; WEINHANDL, Robert; LAVICZA, Zsolt. Transitioning from lectures to online flipped classrooms: Enhancing pre-service teacher education in Luxembourg
	A9	DE JAEGHER, Lut. What Is the Impact of the Flipped Classroom Instructional E-Learning Model on Teachers
	A10	OZCINAR, Zehra; OREKHOVSKAYA, Natalia A.; SVINTSOVA, Marina N. G.; PANOV, Evgeny; ZAMARAEVA, Elena Iv.; KHUZIAKHMETOV, Anvar N.. University students' views on the application of gamification in distance education

Source: Author's own work (2025).

Below, we present an analysis of each of these categories, highlighting the contributions of active methodologies and highlighting the relationships present in the reviewed articles.

3.1 Category: Teacher Training and Distance Education

In this category, we selected articles that contribute to the discussion of teacher training through distance education and which, although they do not specifically address active methodologies, discuss the development of competencies and skills fostered through them—skills that are fundamental for both trainee teachers and students in distance education programs.

Thus, in Article A1, Özüdoğru (2021) aims to reveal the perceptions of future teachers regarding the Distance Education Learning Environment (Deles), proposed by Walker and Fraser (2005). This environment is analyzed based on six psychosocial categories: instructor support, student interaction and collaboration, personal relevance, authentic learning, active learning, and student autonomy. The study compares these perceptions with the Learning Community (CoI) model based on Garrison, Anderson, and Archer (2000), which is grounded in the concepts of instructional, social, and cognitive presence, seeking to clarify the relationships between the two theoretical frameworks. The article concludes that, for effective training in distance initial teacher education courses, the aspect of instructor presence is an essent , which translates into a course with a well-structured *design*, constant *feedback*, contextualized activities, and the promotion of student autonomy and active learning.

Article A2 engages directly with the previous study, in which Morrison and Jacobsen (2023) seek to examine the role and impact of teacher presence—based on Garrison, Anderson, and Archer (2000)—on the engagement, self-regulation, and *online* learning of future teachers. The authors argue that, when applying the active flipped classroom methodology, teachers should provide regular *feedback*, preferably within a few days of the activity, as this gives students the chance to reflect on and correct their work and apply these insights to the next class. They also suggest that *feedback* be personalized, as this encourages students to participate in class, keeps them engaged, and contributes to the self-regulation phases proposed by Zimmerman (2000): planning, doing, and reflecting. This practice helps guide students and gives them the opportunity to know if they are on the right track, also contributing to the development of students' autonomy and engagement, as well as to their learning.

In A3, drawing on authors such as Guerra-Santana, Rodríguez-Pulido, and Artiles-Rodríguez (2019), Rivera *et al.* (2017), Romero (2020), and Sangrà (2020), and in contrast to the discussion in Article A1, the authors argue that social presence through interaction and collaboration among participants is the foundation for well-structured distance education that promotes active learning. They also discuss the digital tools used in distance learning as part of a set of resources employed within the context of active learning. The idea is that future teachers can adopt and utilize these practices in their professional careers.

3.2 Category: Active Methodologies and Distance Learning

This category highlights the application of active methodologies in the context of distance learning. The selected articles explore different approaches, such as *online* cooperative learning and the flipped classroom, as well as aspects related to teacher presence and self-regulation of learning, emphasizing how these pedagogical strategies contribute to student learning in initial teacher education courses in this modality.

In Article A4, the first in this category, Chakyarkandiyil and Prakasha (2024) discuss the application of *online* cooperative learning in the context of initial teacher education. The study also presents practices that enhance the teacher's presence in distance education and discusses timely, strength-based, and personalized *feedback* to improve the teacher's *online* presence, thereby supporting student learning. According to the authors, this practice contributes to the self-regulation phases proposed by Zimmerman (2000): planning, production, and self-reflection. This practice helps guide students and gives them the opportunity to know if they are on the right track, also contributing to the development of students' autonomy, engagement, and learning.

Article A5, on the other hand, discusses the flipped classroom methodology in comparison with traditional teaching. Molina-Torres (2022) argues that the flipped classroom approach uses an interdisciplinary perspective and promotes active and meaningful learning, since students delve into the theoretical content during the pre-class phase, so that synchronous class time can be dedicated to collaborative and in-depth activities under the teacher's guidance. The author also emphasizes that this methodology

combines individual and group work and is effective in developing educational competencies in both students and teacher trainees.

Regarding Article A6, which aims to determine which approaches, methods, and techniques were used by pre-service teachers during the teaching component of the Internship II course at a public university in Turkey, the pre-service teachers argue that student-centered teaching, with effective interaction between student and teacher, and contextualized teaching are fundamental aspects for effective teaching to occur.

3.3 Category: Active Methodologies and Teacher Education

This category brings together studies focused on the application of active methodologies in initial teacher education programs. The analyzed articles highlight how these approaches contribute to the development of competencies such as autonomy and critical-reflective thinking, as well as digital competencies and self-regulation of learning. Furthermore, the studies indicate that, although these methodologies promote more meaningful learning and student engagement, their implementation requires careful pedagogical planning, mastery of digital resources, and a rethinking of traditional teaching approaches.

In Article A7, Rodrigues (2022) addresses the development of technological competencies among pre-service teachers in the field of Accounting. The author presents the active teacher training method, which is a training process that utilizes active learning and student-centered methods as resources. She further argues that this is a process that enhances and develops teachers' competencies. In other words, active teacher training is a practical and participatory way to prepare educators, in which they learn in the same way they are expected to teach. This creates a positive cycle: teachers learn actively and then teach their students in the same way. This model contributes to the construction and development of competencies such as reflexivity, autonomy, networked communication, participatory assessment, and self-regulation.

In Article A8, Kreis *et al.* (2024) engage with the contributions of Article A5, as it addresses the transition from traditional lecture-based classes to the flipped classroom in the context of distance learning. The authors reflect on the positive and negative aspects

observed in this methodological shift, noting that, in addition to improving student performance, the flipped classroom has helped students become more independent and engaged, allowing them to immerse themselves more deeply in their learning.

Regarding the article titled A9, De Jaegher (2020) argues that the flipped classroom methodology allows teachers and students to explore deeper dimensions of knowledge during in-person sessions. This is because the necessary foundational knowledge is acquired before class, allowing classroom time to be dedicated to active learning activities. However, he also highlights that the successful implementation of the flipped classroom depends not only on proper planning but also on teacher training. Furthermore, he emphasizes that one of the challenges of applying this active methodology is the considerable workload required for the development and selection of materials, as well as the need for an adequate level of digital skills, compounded by a possible lack of interest among students during pre-class activities.

Article A10 discusses *gamified* teaching in education faculties at universities in Cyprus and Russia as part of the training strategy for future teachers of elementary and early childhood education. According to Ozcinar *et al.* (2021), *gamified* learning meets the demands of today's students—digital natives immersed in technology—as this type of learning offers engaging content and an effective teaching method, transforming abstract concepts into concrete content. However, for teaching using this type of methodology to be effective, it is necessary for the future teacher to have classroom control and knowledge of *gamification* and digital competencies.

Beyond the categories and analysis of the selected articles, this integrative literature review revealed that, of the ten included studies, six addressed the active methodology of the flipped classroom, one dealt with the contributions of *gamification* to teaching, two discussed the competencies and skills promoted by active methodologies, and one focused on collaborative *online* learning. Regarding the methodological approach, qualitative studies predominate, appearing in six articles, while quantitative and mixed-methods approaches were adopted in two studies each. In terms of subject areas, seven articles focused on the Humanities and the other three on the Exact and Earth Sciences.

4 Discussion

The main objective of this study was to understand the international academic community's perception of the contributions that active methodologies offer to initial teacher education in the distance learning modality. In general, the analyzed articles indicate that active methodologies are present in initial teacher education courses and contribute positively to the development of essential competencies and skills, such as self-regulation of learning, autonomy, teamwork, and critical-reflexive thinking. In this sense, such methodologies serve as important allies in the teaching and learning process.

A recurring theme in the analyzed studies is the emphasis on practice in the training process. The authors highlight that digital and communicative competency, for example, cannot be fully developed based solely on theory, as practice is an essential part of this process. In this sense, they advocate for placing students in real or simulated situations through active methodologies that foster reflection and experimentation. Based on theorists such as Dewey (1960) and A. Kolb and D. Kolb (2005), the same applies to technical skills; communication, for example, is identified as a skill that is most effectively improved when experienced in concrete contexts of interaction.

In this sense, the active methodology of the flipped classroom was the most frequently mentioned in the reviewed articles. Overall, the results indicate that its application promoted greater student engagement, better understanding of the content, and improved academic performance. From this perspective, based on Galway *et al.* (2014) and Wasserman *et al.* (2017), the authors argue that the more passive stage of learning, such as theoretical reading, for example, should occur before the synchronous session, reserving classroom time for active student participation. Thus, classroom time becomes the focal point, both for learning and for the effectiveness of the flipped classroom methodology.

In addition, a positive shift was observed in students' attitudes toward their own learning process, requiring greater participation, responsibility, and prior preparation on their part. This shift had a direct impact on how future teachers began to understand and plan their future teaching practices, especially in the teaching of subjects such as

mathematics. However, the studies also highlight challenges, such as the need for careful planning, a heavier workload for teachers in developing materials, and the requirement for digital skills for both teachers and students.

Another pedagogical strategy addressed by one of the articles was *gamification*, which proved effective especially for students identified by the authors as digital natives, providing a more engaging learning experience and helping to ensure that the abstract concepts were applied and understood in a concrete way. The authors argue that *gamification* can be used as a strategy to encourage and motivate students to develop new skills and innovative thinking and to facilitate knowledge acquisition through repetition. Despite its benefits, Contreras Espinosa (2016) argues that this type of strategy may favor certain learning styles, but not all. Thus, in addition to understanding its possibilities, it is also necessary to identify its limitations.

Online collaborative learning (OCL) was also addressed as a relevant active methodology in the context of distance teacher education. The article draws on authors such as Hernández-Sellés, Muñoz-Carril, and González-Sanmamed (2019), as well as Seroussi *et al.* (2019), who highlight that OCL contributes to the development of communication, negotiation, active listening, and conflict resolution skills. Furthermore, this active methodology fosters student engagement, a sense of belonging to the group, and a perception of self-efficacy. However, as noted by Chatterjee and Correia (2020), as well as Kaimara *et al.* (2021), OCL, like other active methodologies, faces challenges related to the accessibility of digital tools and the need for a minimum infrastructure to enable its implementation.

A central point highlighted by two of the reviewed articles was the importance of faculty presence in distance education, discussed based on the studies by Garrison, Anderson, and Archer (2000), using the framework known as CoI, which guides the *design* and assessment used in distance education courses, addressing three aspects: faculty, cognitive, and social presence. Furthermore, timely, personalized, and strength-based *feedback* is highlighted as a fundamental tool for enhancing learning and encouraging self-regulation—a concept proposed by Zimmerman (2000) and Zimmerman and Moylan (2009), which is divided into three phases: planning, execution, and reflection—thereby aiding student organization and engagement. Although practices such as these were

originally developed for face-to-face education, Obizoba (2016) argues that they can be even more effective in the context of distance learning. This is due to the fact that students in this mode of instruction need to develop higher levels of autonomy, time management, and organization to carry out and complete the assigned tasks.

In summary, the analyzed articles demonstrate that active methodologies offer important contributions to the initial training of teachers in distance education, particularly by promoting meaningful, contextualized, and student-centered learning. However, their effectiveness is directly related to the preparation of faculty, careful pedagogical planning, and the overcoming of structural and technological barriers. Thus, the importance of continuing teacher education for the conscious and effective use of active methodologies is highlighted, in order to enhance the training process and contribute to the practice of future teachers.

5 Final Considerations

Through this integrative review, we sought to answer the following research question: what have international scientific articles shown regarding the contributions of active methodologies to initial teacher education in the distance learning modality? The results indicate that active methodologies have been applied in this context and can contribute to the development of essential competencies and skills, such as student autonomy, critical-reflective thinking, communication, creativity, and teamwork. These competencies are fundamental for both teachers in initial training and students in distance learning courses in general. Furthermore, it was possible to infer that many active methodologies traditionally used in face-to-face education can also be adapted and successfully applied in distance education. Thus, this study contributes to advancing discussions on initial teacher education, distance learning, and active methodologies by providing an international overview of these topics and enabling a broader understanding of the practices and perceptions of the international academic community regarding the subject.

Future research could extend the time frame to 10, 15, or 20 years, allowing for a more in-depth analysis of how these themes have been addressed over time, especially in light of advancements in ICTs. Furthermore, future studies could deepen the discussion by

analyzing dissertations and theses, as well as include new databases, which would contribute to obtaining a more robust and representative sample.

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