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Research competence

The development of every society is based on education. Research is essential to improve the quality of education and innovate it. In this sense, research competence is essential for the critical analysis of educational concepts and practices, the advancement of knowledge and the design of evidence-based strategies for improving the teaching-learning process, among others.

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Editorial

The construction of a democratic and critical citizenship depends, among other factors, on the competence of education professionals. Nowadays, the development of educational interventions informed by scientific evidence is increasingly important, because it is necessary to give answers as adjusted and adapted as possible to the complexity of social challenges, and to do so with real and evidenced impact from an educational equity perspective.

Among the competencies that integrate the training and professional profile within the field of education, the researcher is undoubtedly one of the most important in this intervention approach. It is a competence that allows activating capacities and skills linked to systematic observation, planned inquiry, complex analyzes and critical reflection of educational reality.

Training, updating and improving research competence can contribute to professional development and have implications for the design of public policies and their implementation in innovative educational programs and actions. Thus, the ability of education professionals to develop research skills and apply scientific approaches is a key aspect to boost equity and improve educational quality, while promoting the advancement of educational knowledge from an educational equity perspective. Artificial intelligence opens up a new space of implications that are already influencing the way education is taught and learned by researchers.

This Monograph seeks to offer a space for debate and scientific reflection to share innovative approaches, successful practices and challenges related to the development and strengthening of research competence among education professionals, both from initial training and from lifelong learning.

The first article "AI in the development of research competences in postgraduate studies" highlights the increase in the use of technology in education that has currently been enhanced with AI. Aguirre, Esquivel, Navarro and Veytia analyze the attitudes that postgraduate students from 10 public and private institutions of Higher Education have about this use in their training and strengthening of research skills. The results indicate the existence of uncertainty in university students along with the understanding that for using this easy and attractive technology, it is necessary to develop skills, responsibility and cognitive processes.

Pascual and López in their article "Research competence, action-research and ongoing teacher training" show the impact that a permanent training seminar had on the development of the research competence of teachers, the promotion of educational innovation, the transformation of educational practices and the importance of research of the teaching practice itself. In this sense, the seminar stands out as an effective space to promote transformative skills and practices.

The scientific writing, as part of the research competence, represents the focus of the third article where the perception of researchers in the areas of social and human sciences in relation to their competencies of writing scientific articles is determined. López, Tobón and Chávez found a high level in the aforementioned competencies as well as predictive variables of a greater publication of articles in

terms of male gender, methodology and research experience. Accordingly, they suggest the need for methodological training and increased support for women researchers.

The fourth article on "Research competence in post-compulsory secondary education (baccalaureate)" investigates the teaching and student perception of the transversal and specific research competencies that they develop in subjects such as "Research Work". Rubio, Calduch and Bozu underline the importance of promoting these competencies transversely in the curricular areas since they develop skills such as critical thinking, self-learning and information search.

In the last article of the monograph section, Vázquez analyzes the measurement instruments they use to evaluate the competencies required for research and that university students have in the educational field. According to the PRISMA protocol, this study obtained as a result the existence of instruments that not only evaluate the acquisition of these competencies but also the effectiveness of pedagogical interventions that seek their mastery, considering from the meta-cognitive competencies to the context of the research. In addition, the author evidenced a prevalence of traditional questionnaires and validation processes.

The Miscellaneous section addresses various topics in the area of education starting with the emerging technological tools and their uses in the teaching-learning process, along with teacher training, educational inclusion and school dropout.

First, the article "Educational frontiers with ChatGPT: a social network analysis of influential tweets" aims to analyze the public reception that ChatGPT has had before the growing interest of the population for its use and its educational implications. To do this, the most influential tweets are considered, and the perception and attractiveness of this tool is evidenced with a view to educational improvement. Firat and Kuleli conclude that AI, without neglecting ethical and practical challenges, can optimize educational processes by highlighting the results about its potential and benefits in the content creation, personalized and interactive learning, creativity, critical thinking and access to quality education.

In the second article, Phuong highlights the relevance of online learning and analyzes the advantages it has for English teachers. This quantitative research highlights the benefits of building learning communities in online environments of Khanh Hoa University (Vietnam) in relation to collaboration, professional development, continuous learning, exchange of ideas and teaching experience; since they favor the creation of a dynamic professional network in which teachers can also be trained to improve the learning environment of their students.

Teacher education has also been mediated by technology, especially since the SARS-CoV2 pandemic. Faced with the challenges generated by educational conditions during the pandemic, the need for continuous training of teachers was raised. In this sense, the third article "Teaching knowledge: perspectives for lifelong learning in southern Brazil" presents a participatory action research project in which technological innovation is proposed as a means and an end, since it not only seeks to methodologically innovate teaching work but also generate pedagogical products as a result of this methodology. Kurtz, Rodrigues and Pansera indicate in the findings a redefinition of teaching in relation to the teaching role and a training that considers pedagogical and technological dimensions.

From a more social perspective, the article "Cultures, policies and inclusive practices according to university students" addresses the importance of diversity to analyze the development that inclusive education has had in university contexts from the student perception. Clavijo, Cedillo and Cabrera highlight the role of the institution in the generation of inclusive policies and highlight the need to respond to diversity throughout the educational process. The relevance of this research in inclusive education could be a reference for the development and implementation of policies from the time students access to higher education.

Suberviola focuses on the problem of early school dropout to determine those factors that influence it and that are related to the identity of the person. The results show that the identity traits of students such as gender, age, mother tongue, nationality and place of residence significantly influence the continuity of their training. In this way, the author highlights the importance of educational institutions knowing those traits and defining actions to avoid future cases of school dropout. The article represents an interesting analysis for Spanish society and other countries with high rates of this educational phenomenon.

Academic production shows an interest in the use of technology in the various aspects and processes of education, which is reflected in the latest publications of the journal with its prominent pedagogical benefits. In this topic, AI stands out with its possibilities in education and research, but without neglecting the limitations and ethical implications of its use. The positioning of institutions, teachers and researchers on its use becomes a topic of debate and, in this line, future monographs of Alteridad will represent a space for analyzing topics related to AI and digital competences along with educational reforms and policies in different areas of education.

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Monographic section
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AI in the development of research skills in postgraduate studies

La IA en el desarrollo de competencias investigativas en el posgrado

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Abstract

In the 1970s, technology opened horizons to the educational field, not only to problematize about it and its impact on teaching and learning, but also to expand the resources available to teachers to enhance their pedagogical mediation. However, it would be in the 21st century when the development of digital technology came to enhance the use of ICT for educational purposes, up to Artificial Intelligence, to build bridges that favor its incorporation into teaching at the higher level. Thus, in the field of disciplinary training, the strengthening of knowledge and research skills must include the effective use of technological resources in the training of college students. This article reports some results of a study whose objective was to analyze the attitudes that graduate students have about the use of AI in their education. The study had a quantitative approach with a descriptive transactional non-experimental design, in which 118 subjects participated, distributed in 10 Higher Education Institutions, 5 of them public and 5 of them private. Among its results, the uncertainties that the participants of the study have regarding the use of AI can be appreciated, while recognizing its ease and the attractiveness of a technology that requires specialized skills, responsibility in its use and cognitive processes typical of research.

Keywords: competences, research, training, ICT, Artificial Intelligence, higher education.

Resumen

En los años 70, la tecnología abrió horizontes al campo educativo, no únicamente para problematizar sobre ella y su incidencia en la enseñanza-aprendizaje, sino también para ampliar los recursos de los que podían disponer los y las docentes para enriquecer su mediación pedagógica. No obstante, sería en el siglo XXI cuando el desarrollo tecnológico digital vino a potenciar el empleo de las TIC con fines educativos, hasta llegar a la Inteligencia Artificial, para tender puentes que favorezcan su incorporación a la enseñanza en el nivel superior. Así, en el terreno de la formación disciplinar, el fortalecimiento de saberes y de habilidades investigativas, pasan por el uso efectivo de recursos tecnológicos en la formación de los universitarios. Este artículo presenta algunos resultados de un estudio cuyo objetivo fue analizar las actitudes que los y las estudiantes de posgrado tienen sobre el uso de IA en su educación. El estudio tuvo un enfoque cuantitativo con un diseño no experimental transaccional descriptivo, en el que participaron 118 sujetos, distribuidos en diez instituciones de Educación Superior, cinco de carácter público y cinco de instituciones privadas. Los resultados muestran las incertidumbres que los participantes en el estudio tienen sobre el uso de la IA, al tiempo que reconocen su facilidad y atractivo como tecnología que requiere habilidades especializadas, responsabilidad en su uso y procesos cognitivos inherentes a la investigación.

Palabras clave: competencias, investigación, formación, TIC, Inteligencia artificial, enseñanza superior.

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1. Introduction

This article first presents an approach to the object of study from the historical to the conceptual view, outlining the closure of the introduction with the review on the use of AI in the context of university training; in this perspective, it starts from recognizing metaphorically that since the pencil was present in the classroom, the technology reached Education.

Since the 20th century, technology has shown a potential development and association with programmed education. It was Sidney Pressey's job to design a machine that could facilitate educational processes linked to the design of an intelligence test. At the time, he would argue that "By simply pressing a key, the person tested revealed his mentality or lack of it" (Watters, 2021, p. 38). A few years later in the 1950s, Skinner and his programmed teaching (Correa Cortés, 2021), would make it possible to translate these principles into educational models mediated by technologies. Undoubtedly, the world was going through an important historical juncture due to the arrival of television, a resource that would be incorporated into school classrooms, so that together with distance education, generated conditions to diversify the educational offer in Mexico; a media that was used in the COVID-19 pandemic by the Mexican government to disseminate curricular content (García Aretio, 2022).

However, it would be in the 1970s and 1980s when technology applied to education would transform when analog and digital resources were combined; so that in the 1990s, the advent of the Internet and the emerging digital culture found in Web 2.0 a technological condition conducive to experiencing innovative ways of mediating teaching-learning; during this time the development of teaching skills that favored the innovation of pedagogical practices started being demanded (Muñoz Martínez, 2020; George-Reyes, 2021).

After a pandemic that forced the implementation of distance and virtual educational models, Artificial Intelligence (AI) has allowed to expand resources to generate learning environments mediated by Information and Communication Technologies (ICT) that require teachers skills to profile them as facilitators of educational processes linked to the diversified use of technologies, by allowing the management of content demanded by the courses taught by teachers through different supports.

In this perspective, talking about ICT and Artificial Intelligence (AI) applied to teaching and the development of skills for research allow problematizing and reflecting academically on the challenges that a university teacher has to make technological resources attractive in the accompaniment process for developing research skills.

So if the academic and epistemic communities would ask themselves about the type of skills, knowledge and attitudes that should be promoted for the development of research competences, the first thing to reflect is the attributes that must be met by those who teach at the university, especially those who teach courses in research methodology, because disciplinary profiles, pedagogical knowledge, didactic skills, research and digital competences, would have to define their teaching attributes.

This is proposed after reflecting on the main challenges faced by those who study at the university and require developing research skills; hence, the institutions of higher education have a commitment that goes from the curricular to the pedagogical and the implementation of an infrastructure to innovate and generate learning environments where ICT and AI are means and resources that enhance training in skills for research.

The objective of this article is to assess the attitudes of postgraduate students, from ten Mexican higher education institutions (five public and five private), who agreed to participate in a descriptive study, whose research question was: what is the attitude of postgraduate students regarding the use of AI tools in their training process as researchers, for which the online questionnaire *Artificial Intelligence and Research Training* was applied.

Talking about the background of artificial intelligence is taking different paths to locate the starting point of this technology. From the philosophical to the mythical, from mathematics to technology developers, there is information that allows us to recognize that the search of the human to have someone to assist him has a long story to tell.

In education, in the 30's with the teaching or programmed education, there was an approach to use technology to assist the teaching and learning processes. In Mac Culloch and Pitts, this journey would have to recognize two pioneers through history, since

in 1943 they presented a model of artificial neurons that is already in the field of AI (Chandra, 2021). Turing would come with a machine capable of operating and having unlimited memory, a researcher who also designs a test to see if a machine can think like a human being. It was in the 1950s, when McCarthy used the term artificial intelligence in a lecture at Darmouth University (Oliver, 2020). Since then, together with a technological development observed in the 90s, the generic acronym TIC has become part of the narratives of innovation and transformation in many orders of human work, including education.

However, it would be in the second decade of a new millennium, when digital technologies and, particularly, AI would become resources to promote learning environments through mediation strategies for teaching, learning and evaluation in higher education. It is in 2023 when Microsoft and Google present their *chatbot* models. However, it would be the company *OpenIA* with its GPT Chat (*Generative pre-trained transformer*) that would achieve the greatest impact, since it would be the application that would best position itself among users eager to experiment with an AI that facilitates their productive tasks.

There were scientists and university academics who also discussed the scope of a resource that facilitates research-related activities by allowing large volumes of information to be handled and content to be produced for knowledge dissemination. The dilemmas are also analyzed, because much of what this technology allows, inhibits the development of some skills that every student – even the university teacher – must acquire and strengthen.

When talking about research training, the authors recognize the role that ICTs, including AI, can play for research training. This educational context includes understanding the role that research plays in the curriculum and the graduation profile as part of the disciplinary attributes to be achieved, according to the educational program.

This leads to distinguishing research in various meanings: *research training vs. formative research*, *the investigative competencies* of *research skills*, for example, being that —according to the training discipline— the educational level in which a student is prepared determines the degree of acquisition, the levels of proficiency and the role that disciplinary research plays in his profile. Therefore, it is considered necessary to make a brief conceptual exercise to situate the view from which research training and research competence are understood in the university context.

Serrano et al. (2024) talk about the importance of basic research skills for a teacher in training, among which are knowing how to ask, observe, reflect, propose. These skills are essential for employing technologies and improving interpersonal, cognitive, procedural and communicative relationships. Therefore, they suggest that educational research should be a means to problematize and thus better know the field of training and how to intervene in it.

For its part, *educational research* refers to studies for the search for knowledge that contribute to explaining and understanding certain phenomena or disciplinary problems (Navas-Aparicio, 2021), from a theoretical-methodological rigor that allows to investigate sufficiently grounded objects of knowledge to be able to approach educational phenomena provided with disciplinary knowledge but also with a set of principles that must be distinguished by the person who learns to investigate.

In this regard, it is worth noting that "Research ethics is increasingly known as an important element in the professional training and development of all types of researchers—in the academia, government and industry—and at all levels, from students to professional researchers" (Knight, 2023, p. 1).

As seen from any discipline, academic communities can inquire about ICT applied to teaching on their objects of interest in an educational context: teaching practice, the teaching-learning-evaluation process.

The concept *investigative competencies* is a category linked to the acquisition and development of disciplinary knowledge that allows a student to build and base objects of his discipline, as well as to skills related to the methodological for the planning, design and the collection of empirical data; all this with values and attitudes that allow university students to size, understand, reflect on the importance of research (Juárez Popoca & Torres Gastelú, 2022), to contribute to the understanding of problems linked to the training disciplines.

Therefore, those teachers who promote the learning of research require having research, pedagogical or didactic skills. With research they refer to:

> The ability to mobilize a set of resources (knowledge and know-how), in a defined context, i.e.

> to articulate knowledge, skills and behaviors to integrate them [into their pedagogical practice], supported by the methodology that implements it. (Balbo 2015, p. 29)

Thus, pedagogical competencies are skills to plan, design and intervene strategically in the teaching-learning-evaluation processes; areas where the didactic allows the teacher to know how to use resources to address curricular contents. As said by Kanobel et al. (2023), digital teaching skills in university teachers would mean recognizing the possibilities of technology for designing environments that innovate teaching and learning; these authors also point out the way in which its use has been revitalized after the lived pandemic.

Nowadays, at the higher level and particularly in the postgraduate programs, the use of technological resources has been incorporated from an infrastructure that provides its university students with Internet access, the provision of educational platforms and computer equipment. This has required teachers to develop digital skills to effectively manage information. In addition, a pedagogical practice linked to the use of technologies has involved the transformation of education, favoring active and innovative methodologies that "achieve a functionality of learning" (De la Cruz Campos, 2023, p. 3), and where the teacher is key.

In this perspective, when talking about technological competences, it is to recognize capabilities "to select and use a variety of technological tools in a relevant, responsible and efficient way" (Ministerio de Educación Nacional, 2013, p. 31) that favor innovative educational practices; therefore, a university teacher who teaches research, must have broad attributes that allow him to: know disciplinary objects of study, know the use of ICT for curricular contents, design technology-mediated learning environments, as well as the way in which AI can facilitate the design of learning strategies such as the production of knowledge and acquired skills in the context of research training.

A common point among education experts is that ICT innovates education by enabling the construction of novel learning environments (Ministerio de Educación y Formación Profesional y Administraciones Educativas de las Comunidades Autónomas, 2020; Martínez, 2020; Castañeda et al., 2020). Hence, Artificial Intelligence demands advanced digital competences, in teachers as in university students, to enhance experiences that favor the integral formation of university students; for which it is important that both educational agents have digital domains (SEP, 2020).

In the educational field, Moreno (2019) proposes the analysis of AI from three approaches: "intelligent conversational software agents or more commonly called chatbots, the creation of Online platforms for self-learning and, finally, educational robotics" (in Macías Moles, 2021, p. 15). In the first case, it is a technology that allows interaction between users and conversation, from the generation of instructions (*prompts*). Chatbots (generative AI) would be the best example. For example, a teacher can teach with online platforms, while a student learns in a guided or autonomous way. Finally, robotics promotes a relationship with the student that allows him to develop his creativity and imagination (Macías Moles, 2021).

In this perspective, the development of mobile devices has been key, because through them, there is access to virtual learning environments, such as the AI applications of Google, Microsoft and ChatGPT, technologies that favor real-time interactivity, access and appropriate information related to teaching and disciplinary learning; resources, also available to produce teaching materials in audio, image, video or text.

The UNAM (2023) has just published a notebook with a series of considerations for the responsible use of AI, recognizing the important progress and its inclusion in university educational processes, for which it demands to promote a critical and reflective attitude towards it, starting from familiarizing with its language, the uses that can be given, the way in which it should influence the evaluation, as well as the ethical in its use.

It is worth noting that there are also divergent views ranging from proposals to ban these tools to advocating for changes in curricula and assessment formats. Agencies like UNESCO seek to address the various challenges and opportunities presented by AI by developing multifaceted guides and recommendations. These include AI planning, AI management for education, the use of AI for learning and assessment of learning, AI with gender equity and for gender equality, and AI to support teaching and teachers, among others (UNESCO, 2019).

In this perspective, the student must be an active subject, especially when using the IAGen,

since it allows interaction and feedback between him and the resource, where teaching mediation must be key, being able to make suggestions about the type of information that his learning requires; in the understanding that the "IAGen concentrates knowledge of various areas of study, so that it can be asked to behave as a reviewer, advisor or issuer of recommendations instantly" (UNAM, 2023, p. 25).

1.1 Approaches to a state of knowledge

Like all new technology, AI has caught the attention of epistemic communities, particularly among those trained in graduate programs, some of which have academic backgrounds. Therefore, it is particularly interesting the documentary investigations that have been published, on AI, in the educational context (Carbonell-García et al., 2023), where sources that have addressed AI in education are systematized, emphasizing its importance to innovate educational practices and the improvement of teaching. On the other hand, there are studies where the human and its relationship with the machine are analyzed in the light of digital skills that can enhance the use of educational platforms (Bonani, 2020, p. 43).

Chávez Solís et al. (2023) highlight the role of AI in handling large volumes of information, which greatly facilitates academic work, when it comes to systematizing and appropriating information linked to research projects. Meanwhile, Melo Hanna et al. (2023), carry out a documentary study whose objective was to show the role that AI can play in education. They take as theoretical constructs: online platforms, personalized education, *Deep learning*, educational *robotics*, *machine learning* and *chatbots*. Recognizing the thematic breadth of AI, they underscore the importance of AI in transforming the experiences of teaching and learning around the world (2023).

The interest in AI—as an object of knowledge—finds in engineering its natural field. For example, Alonso Astruga (2021), motivated by the design of a *chatbot* that responded to the needs of the user, aims to make a "methodological proposal for analyzing the requirements and design of *chatbots*, of questions and answers" (p. 2), for which he implements a methodology that allows him to develop a system and a *chatbot* prototype. As an author, he observes that, although he achieved the objectives, he recognizes the lack of information that fed the prototype to facilitate "certain functions" (2021, p. 87), to the user. As for education, he says: "the roles that the *chatbot* can take in communicating with students have been demonstrated" (p. 91), where the questions and answers are the generators of interactive learning.

For his part, Martínez Díaz (2021), develops a *chatbot* and a Web application for child learning. The goal was to create the conversational interface for both technologies that would explain meteor classification to children. For this author, AI for educational purposes has played an important role, as a result of communication and interactivity in its use; which is why *chatbots* have a potential to promote learning, without this supposing the replacement of the teacher, but student learning focused on questions that allow the consultation of concepts and dialog on various topics. Martínez Díaz (2021) points out that an AI also contributes to inclusive, equitable and quality education.

Pedraza Caro (2023) investigates AI in its social dimension. Recognizing its advantages and the dilemmas involved, the objective is to "Identify the main risks, challenges and opportunities of Artificial Intelligence in society, in the coming years" (p. 2). After a documentary review of its evolution, the author highlights the impact that AI has had in various professional and disciplinary fields. In the conclusion the author speaks of the "imminently powerful opportunity" (p. 43) of AI, but also of the dilemmas and risks if an ethical attitude is not assumed in its employment and areas of use. On the challenges, the author refers to "the labor and gender gap" (p. 46), seen in industry 4.0.

Meanwhile, Akgun and Greenhow (2022) and Wang and Cheng (2021) agree on their studies on the application of AI in K-12 educational environments (primary and secondary), with the former in the United States and the latter in Hong Kong. Both groups of researchers highlight the ethical and social concerns related to the implementation of AI and the need for teachers to have a solid pedagogical understanding of this technology. However, while Akgun and Greenhow view AI as a positive resource that enhances teachers' educational experiences, Wang and Cheng identify first- and second-order barriers. These barriers include the pedagogical integration of AI into the curriculum, resistance to change by teachers, and the perception of AI as a threat rather than an educational tool. Liu et al. (2023) conclude that most Chinese scholars support the careful inte-

gration of AI tools into education, viewing them as a tool for personalized learning.

Finally, the work "Artificial Intelligence as an educational resource during the initial training of teachers" (Ayuso-del Puerto & Gutiérrez-Esteban, 2022) recognizes the way in which AI facilitates the personalization of learning. The methodological design was mixed for which authors used a closed questionnaire and open interviews. 76 initial training teachers participated. Among its results, it is highlighted that in items on the ease of using AI, as well as its importance for the development of educational projects, the participants showed indifference (52.6% and 43.4%, respectively), while 42.1% said they felt insecure to design academic projects with this tool, which does not prevent 55.3% from accepting the possibility of using it in future projects. The authors conclude by talking about the redefinition of the teaching role, linked to the creation of resources and the development of technological skills. They note that, although there are uncertainties about the ease of using AI, those who participated in the study ended up positively assessing its use, considering "its pedagogical potential, coming to recognize the usefulness of AI in the teaching process and recommend its use to other teachers" (2022, p. 354).

After reviewing the literature, it is pertinent to know that students who are trained in research face challenges to master different competencies related to the design of the research, its theoretical foundation, data analysis, interpretation, as well as the partial or total presentation of the results. However, there are processes that can be facilitated with ICT.

Cárdenas (2023) points out that AI allows to reduce the time in the conduction of different activities so that students can focus on those that favor the development of higher order skills: processes of analysis, interpretation and reflection of results. However, there is also a risk of employing AI tools that weaken cognitive skills, which has generated an academic debate about the use of this technology in research training.

In the coming decades, AI is expected to have a significant impact on scientific creativity and the way in which social phenomena are addressed, which is why researchers in training must take advantage of the opportunities implied by using different technologies (Torres-Gómez, 2023).

In this sense, the variable *research competencies* and attitudes to the use of AI by graduate students (Specialty, Master's and Doctorate) are particularly interesting, since the use of applications linked to AI does not depend only on their access, but on the attitudes of the students towards their use in training processes and in the development of research competencies.

This has been the focus of the research reported here, considering relevant to analyze the attitudes of postgraduate students against a complex and dialectical dynamic that involves using ICT in their research training at the graduate level.

2. Methodology

The research was carried out from a non-experimental descriptive design, with a quantitative approach, the objective to analyze is the attitude of graduate students in Social Sciences and Humanities to use AI as an educational resource in their research training process.

For developing the research, the online questionnaire *Artificial Intelligence and Research Training* was designed, which allowed generating information that answered the question: What is the attitude of postgraduate students in the use of AI tools during their training as researchers?

The instrument was organized in five dimensions based on different authors (Table 1) and constituted with Likert scale indicators with five response options ranging from 1. Totally disagree, 2. Disagree, 3. Neutral, 4. Okay and 5. I totally agree.

Table 1. *Dimensions of AI and Researcher Training*

Dimension	Concept
Perception of AI in Research	Learning uses of AI to promote learning situations that strengthen research processes (Ng et al., 2023).
Applicability of AI in Teaching – Learning and Evaluation processes	Some of the applications that have been used in the teaching-learning process through AI enhance the personalization of learning, automated evaluation, intelligent tutoring (González-González, 2023).

Ethics of AI in Research	Fundamental issues and principles based on responsibility, privacy, equity and explicability must be addressed (Villas and Camacho, 2022).
Future of AI in research	Among the possible scenarios of the use of AI in research processes in the future are: a) greater access to a variety of tools, b) training and c) acceptance of the use of AI by academics; while highlighting some barriers such as the misuse of AI, increasing inequalities, lags in digital matters (Cárdenas, 2023).

2.1 Sample frequency and characteristics

The research was carried out in August-October of 2023 in ten institutions of higher education that offer postgraduate programs related to the Social Sciences and Humanities, five of them public and 5 private, in which 118 subjects participated. The student population consisted of 72 women (61%) and 46 men (39%). In terms of age, it ranged from 23 to more than 53 years, with the range representing a greater percentage of those aged 23 to 27 years with 24.6% and the lowest being over 53 with 6.8%. The studies that take 44.9% are master's degrees, 32.2% doctorates and 22.9% at specialty level.

In terms of availability and access to technology, 100% have their own devices to access the internet, the place of connection is 73.7% at home, 23.7% at work, 1.7% at the University and 0.8% in another space. As for their connection time, 61% report more than nine hours a week; 28% between four to nine hours a week and 11% one to three hours a week.

The types of content that the student seeks in these hours is linked to the area of disciplinary training 37.3%, to general information 27.1%, to the research project 22%, to entertainment and leisure 13.6%.

3. Results

The data processing was carried out through the SPSS V25.0 *software*, and the normality of the results was verified with the *Kolmogorov-Smirnov* test for selecting the type of statistic to be used.

Table 2 integrates the processing, the proportion of AI applications or sites that reported knowing and using key informants.

Table 2. *Distribution of known and used applications*

	Have knowledge		Use it	
Application	**Cases**	**Percentage**	**Cases**	**Percentage**
Open IA playground	28	23.7 %	28	23.7 %
Rytr.me	4	3.4 %	4	3.4 %
Elicit.org	3	2.5 %	3	2.5 %
Tldr.this	3	2.5 %	3	2.5 %
Boomy	10	8.5 %	10	8.5 %
CALL-E	7	5.9 %	7	5.9 %
Chat GTP	74	62.7 %	74	62.7 %
Synthesia.oi	5	4.2 %	5	4.2 %
Research Rabbit	11	9.3 %	11	9.3 %
ChatPDF	21	17.8 %	21	17.8 %
No	16	13.6 %	33	28.0 %

Table 3 describes the items, organized by dimension. To determine the internal consistency, the *Cronbach* alpha statistic was used, obtaining a high overall coefficient (Alpha = .987) for each dimension, as shown in table 3.

Likewise, the *Spearman rho* statistic was used to find the levels of association between the dimensions, since the data did not follow a normal distribution. As seen in table 3, the correlation coefficients have a medium-high level and have very high significance for their level of association.

Table 3. *Descriptive, internal consistency and dimension association coefficients*

Dimension	Average	Typ. Dev.	Cronbach Alpha	2	3	4	5	6	
1	Perception of AI in Research	3.64	1,122	0.935	.771**	.658**	.665**	.538**	.764**
2	Training and use of AI in research	3.61	1,042	0,927		.730**	.733**	.556**	.754**
3	Application of AI in the teaching-learning process – assessment	3.75	1,055	0,950			.732**	.707**	.737**
4	Benefits and challenges of AI in Research	3.60	1,053	0,965				.636**	.697**
5	Ethics and responsibility in the use of AI in research	4.02	1,189	0,983					.636**
6	Future of AI in Research	3.71	1,137	0,965					

** = $p < .01$

Additionally, after generating the scales by dimension and global, the case distributions for the three levels were obtained, as shown in table 4.

Table 4. *Scales for each dimension*

Perception of AI in the research		Type and use of AI in the research		Use of AI in the teaching – learning process - assessment		Benefits and challenges of AI in the research		Ethics in the use of AI in the research		Future of AI in the research		Global		Perceptiof the AI in the research	
Level	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
High	68	57.6	74	62.7	77	65.3	71	60.2	83	70.3	67%	56.8	80	67.8	
Medium	32	27.1	27	22.9	23	19.5	30	25.4	21	17.8	34	28.8	23	19.5	
Low	18	15.3	17	14.4	18	15.3	17	14.4	14	11.9	17	14.4	15	12.7	

Discussion and conclusions

Based on the data presented, it is worth mentioning that the master student is interested in the knowledge and use of AI applications, focused on tools such as *OpenAI Playground*, *ChatGPT* and *ChatPDF*. These platforms represent a differentiated set of resources that make it easier to explore and experiment with AI in research training from different didactic perspectives.

In the case of *OpenAI Playground* it represents an interactive environment that students them to experiment with AI models, modifying parameters and observing how these changes affect the model's performance in real time. In this sense, it is a useful tool to understand fundamental concepts of AI and experiment with machine learning algorithms in an accessible and practical way.

As for *ChatGPT*, by its nature as a language model, master students use it to interact with AI, providing them with coherent and contextual responses from given instructions. This is an opportunity for graduate students to explore the potential of AI as a virtual assistant, content creation, and dialog generation. Meanwhile, *ChatPDF* allows them to automate reading, synthesizing important ideas, and generating document summaries in PDF format.

The favorable attitude of master students towards the diversity and ease of access to applications reflects their recognition of the development and presence of AI in any academic and professional field, i.e. "virtual interaction, regulated by the parameters of AI allows to ease learning, since support mechanisms will be available, when neces-

sary, regardless of the time and space of the user" (Ocaña et al., 2019, p. 538). These digital alternatives allow them to familiarize themselves with key concepts, experiment with information, communication, knowledge and digital learning technologies (TICCAD) (SEP, 2020) and explore their potential applications, providing them with a range of resources in support of research in their fields of knowledge.

It is appropriate to highlight the measurements associated with the ethical dimension and responsibility in the use of AI in research, in the understanding that UNESCO (2022, p. 34) demands "to encourage research initiatives on the responsible and ethical use of AI technologies in teaching, teacher training and e-learning…". Those who have participated in this study, consider relevant the practices of data and information collection, processing and critical analysis, as well as the integration of research results and reports of information or data, attached to the reliability and codes of academic honor essential for a scientific investigation.

In this context, one of the contributions of this study is to recognize that, beyond the use of AI as tools for the management of large volumes of information and the production of content, the contributions of AI must be harmonized with the necessary conviction of substantiating valid argumentative-discursive inputs, with sufficient scientific solidity and depth, typical of the competencies and metacognitive attributes of those who are formed in the university and its postgraduate courses. In this sense, it is confirmed the relevance of ICT to facilitate comprehensive educational processes (Chávez Solís, 2023), in which the training itinerary lived by the graduate student is transformed by the way in which it is taught and learned, and it presents evidence of learning typical of research, but assisted by AI, which allows strengthening research skills among university students (Juárez Popoca & Torres Gastelú, 2022).

One of the limitations of this study is that it focuses on postgraduate training in Social Sciences and Humanities in Mexico, so other fields of knowledge could be incorporated in later studies to assess the attitudes that students with other different epistemic trajectories may have about the use of AI in their research training; including teachers who teach courses in research methodology.

Finally, it is urgent that university teachers strengthen their disciplinary, pedagogical and digital domains to enhance the use of ICT in TICCAD (SEP, 2019), where AI offers alternatives to transform the teaching of research as the development of research skills.

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Research competence, action-research and ongoing teacher training

Competencia investigadora, investigación-acción y formación permanente del profesorado

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Abstract

This article examines the impact of a continuing education seminar on Formative and Shared Evaluation (F&SA) on the research competence through the implementation of Action Research (A-R) cycles to promote educational innovation. This study is based on qualitative methodology that analyses of meetings and reports made by teachers. The results show that the seminar facilitated the transformation of the participants' educational practices, promoting significant changes in their attitudes and approaches to evaluation. In addition, it helped to develop aspects of their research competence and to generate positive perceptions about the importance of researching their own educational practice and the value of discussion and reflection. The A-R cycles, reflection and discussion helped to overcome challenges such as a lack of knowledge of F&SA practices and resistance to change. The seminar proved to be an effective space for generating transformative practices, fostering teachers' research competence and addressing emerging obstacles. It seems relevant to develop initiatives that promote the research competence of teachers linked to processes of lifelong learning and educational innovation, which contribute to quality education.

Keywords: research competence, lifelong learning, educational research, methodological training, educational professional, reflective practice.

Resumen

Este artículo examina el impacto de un seminario de formación permanente en Evaluación Formativa y Compartida (EFyC) en la competencia investigadora del profesorado, mediante la implementación de ciclos de Investigación-Acción (I-A) para promover la innovación educativa. Este estudio se basa en una metodología cualitativa que analiza actas de reuniones y los informes realizados por el profesorado. Los resultados muestran que el seminario facilitó la transformación de las prácticas educativas de los participantes, promoviendo cambios significativos en sus actitudes y enfoques hacia la evaluación. Además, ayudó a desarrollar aspectos de su competencia investigadora y a generar percepciones positivas sobre la importancia de investigar su propia práctica educativa y el valor del debate y la reflexión. Los ciclos de I-A, la reflexión y el debate ayudaron a superar desafíos como el desconocimiento de las prácticas de EFyC y las resistencias al cambio. El seminario demostró ser un espacio efectivo para generar prácticas transformadoras, fomentando la competencia investigadora de los docentes y abordando los obstáculos emergentes. Parece relevante desarrollar iniciativas que fomenten la competencia investigadora del profesorado ligada a procesos de formación permanente e innovación educativa, que contribuyan a una educación de calidad.

Palabras clave: competencia investigadora, formación permanente, investigación educativa, formación metodológica, profesionales de la educación, práctica reflexiva.

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1. Introduction

Current education is under constant review to adapt to changing social needs (Paniagua et al., 2017). This process of renewal needs to redirect education towards more transparent and higher quality practices.

Within this context, research competence is essential to address the challenges of current education. Research competence involves the activation of skills for inquiry and critical analysis, and the ability to rigorously apply the scientific method in the educational field to achieve improved educational quality (Ain et al., 2019; Bates & Sangra, 2021; Cobos et al., 2016; Sánchez-Santamaría, 2013).

In this sense, strengthening research competence not only promotes educational excellence, but also drives change and continuous improvement in the school environment. As Andreu and Labrador (2011) point out, research in education not only drives the progress of student learning, but it is also essential for the teacher professional development (Latorre, 2003). Educational research must be based on scientific evidence, as emphasized by Imbernon (2019), to ensure its reliability and its positive impact on educational innovation.

1.1 The importance of continuing teacher training

Educational improvement can be promoted through the development of the Permanent Teacher Training (PTT), an indispensable condition for teaching tasks (Domínguez & Vázquez, 2015; Imbernón, 2017; Pérez-Granados, 2018; Souto-Seijo et al., 2020). This is what Stenhouse (1984) considers, when proposing the concept of research professor, understanding that this concept implies a critical and systematic disposition towards the educational practice itself, which has materialized through the PTT. This commitment to teaching and constant inquiry is reflected in training processes that encourage reflection, the raising of questions and the search for solutions to real challenges in the classroom (Marcelo & Vaillant, 2009; Margalef, 2005). As pedagogical knowledge is constantly evolving, PTT becomes essential to keep teachers updated and ensure the quality of their practice (Souto-Seijo et al., 2020).

PTT can be considered as the continuous learning process that helps teachers to access and effectively use new pedagogical knowledge that they can apply in their daily practice, because it promotes professional development, continuous improvement in teachers and, consequently, a positive effect on student outcomes (Kennedy, 2004). Kenedy (2014) considers that PTT generates transformative professional learning, as it is a process that produces change in teachers through teaching to think, reason and reflect.

Teachers can change their perspectives through their own research processes on their practice, to make decisions based on new knowledge (epistemological, sociolinguistic and psychological). In this way, the impact of the PTT will not be reproductive, but will be transformative and will affect educational communities (Kennedy, 2014); starting from the reflective learning itself, in which teachers will improve their practice as a result of the resolution of a problem or concern (Nieto, 2000). Consequently, the transformative approach of PTT can have a ripple effect, positively affecting the educational communities, from small changes that are made in each classroom. In this way, through these small changes, educational communities would be transformed through the collaborative effort that supports the transformative practice (Kennedy, 2004).

1.2 Action-research as a proposal for Lifelong Teacher Training

As pointed out so far, PTT stands out as a crucial process for continuous improvement in the educational field, where research is essential for this commitment. Research in education not only generates changes and new knowledge, but also promotes advances in student learning and in the professional development of teachers. According to Whitehead (1989), research is presented as a form of living educational theory, by constantly questioning which aspects of teaching practice can be improved.

Latorre (2003) highlights research as an essential element in the professional development of teachers, since the teaching profession requires a constant adaptation to social and educational changes. Through research, teachers acquire new knowledge that allows them to improve their teaching practice, thus contributing to professional self-development,

practical improvement, the educational institution and social conditions in general. This research process also encourages reflection on professional identity, which promotes self-criticism and reflective analysis of one's own practice.

Action Research (A-R) stands out as an effective model to develop educational research and promote the professional development of teachers. In this approach, the teacher assumes the role of researcher and uses the classroom as his/her study space, encouraging reflection and critical analysis of educational events to improve one's own teaching practice, professional skills and curriculum application. Imbernon (2019) points out that through the PTT and A-R, teachers can develop pedagogical knowledge from their experience in educational institutions. The A-R integrates within the models of PTT that prioritize research, offering an effective methodology for both research and teacher training.

1.3 Relevance of Formative and Shared Evaluation in the improvement of teaching practice

It is important to note that PTT activities can be generated when working with curricular elements (Moore, 2020). In this study we work through the Formative and Shared Evaluation (F&SA). F&SA is defined by López-Pastor (2009) as an educational evaluation system that promotes three types of improvements: student learning, teaching quality and the teaching-learning process carried out; evaluative processes in which the student actively participates.

Some authors (Domínguez & Vázquez, 2015; Imbernón, 2017; Pérez-Granados, 2018; Souto-Seijo et al., 2020), indicate that PTT is an essential component to effectively integrate new methodologies in the classroom; in this case, it would be about F&Sa systems at all educational levels. Research by Barrientos et al. (2019), Hortigüela-Alcalá et al. (2015), Molina and López-Pastor (2019) and Pascual-Arias et al. (2022) reveal that teachers acquire skills related to F&SA both during their initial training and through the PTT. This formative approach, especially in the context of PTT, provides educators with the necessary tools to engage students in meaningful and formative assessment processes.

Adopting A-R as the usual methodology of work and PTT helps teachers who are trying to develop F&SA systems in their classrooms, especially when it comes to finding strategies to address the specific challenges that arise in these educational innovation processes (Herrero et al., 2021; López-Pastor et al., 2011, 2016; Pascual-Arias et al., 2022; Pascual-Arias et al., 2023; Pedraza & López-Pastor, 2015). Through these dynamics of A-R teachers have the opportunity to develop research skills.

Studies suggest that PTT can be a suitable space to develop a deep understanding of the principles and practices of F&SA, as well as to acquire skills that allow teachers to apply these concepts effectively in their specific educational context (Barrientos et al., 2019; Herrero et al., 2021; Molina & López-Pastor, 2019).

In this sense, the PTT can play a fundamental role in the training of committed and thoughtful teachers, able to adapt and respond effectively to the changing needs of their students and society in general.

Therefore, there seems to be little research that relates the dynamics of PTT based on spirals and cycles of A-R with the development of research competences in the teaching staff, specifically in the topic of F&SA. This study can help to deepen this topic.

Therefore, it will be investigated to what extent an interlevel seminar of A-R, working on the application of F&SA systems in educational practice, helps participating teachers to develop research skills, as well as check what benefits it can generate in the professional development of teachers.

To this end, the following Research Questions (PIs) are presented:

PI.1. How has the PTT seminar and the A-R cycles focused on the F&SA influenced the development of the research competence of the participating teachers?

PI.2. What are the main challenges identified by the seminar participants in relation to the development of their research skills and how are these challenges addressed?

2. Methodology

Using a qualitative methodology based on documentary analysis (Bowen, 2009) and reports, this study focuses on the impact of the permanent teacher training seminar on F&SA and the research competence that is developed through it. Documentary

analysis is a technique that allows examining and understanding documents to contextualize and deepen on the research (Bowen, 2009). Although it is not a case study in the most rigorous sense, the depth and detail of the analysis allow to obtain a comprehensive understanding of the situation studied, exploring a real and specific context (Álvarez & San Fabián, 2012). This methodological approach allows to describe, document and interpret the investigated environment, generating concrete observations that facilitate more general and significant conclusions (Yin, 2018; Simons, 2011; Stake, 2010).

2.1 Participants

The participants of the case study are 25 teachers of all educational stages (from Early Childhood Education to University Education), belonging to an interlevel seminar of PTT on F&SA that is conducted in a Faculty of Spanish Education. These teachers carry out cycles of A-R to practice their research and educational innovations on F&SA, which allows them to advance their knowledge and practice from the level of previous experience that each one has.

2.2 Data collection techniques

Different tools have been used to obtain data:

- A-R seminar meeting minutes: these are documents that collect all the information discussed during the seminar sessions, including: (a) the list of participants present at each meeting; (b) the questions raised around the implementation of the F&SA and the cycles of A-R in the classroom; (c) the debates and concerns about the F&SA and A-R processes carried out, both based on previous readings and comments from the attendees. The corresponding records have been analyzed from the 2017-2018 academic year to the 2022-2023 academic year, for a total of 50 minutes of seminar meeting.
- Good practice reports: these are documents prepared by the participants of the F&SA seminar; they reflect their experience in implementing this approach in the classroom through A-R cycles, as well as the results obtained in the each school year. These reports consist of two parts: (a) the planning of the F&SA system to be implemented; (b) recording of the actions carried out, observations, results obtained and proposals for their improvement. A total of 62 good practice reports have been collected.

2.2 Data analysis techniques

A content analysis approach has been used to analyze the data obtained from the data collection techniques, which allows to examine the content of the reports and minutes to identify patterns, recurring themes and relevant aspects related to the subject studied. This thematic analysis process has served to categorize and organize the information collected into a system of categories and subcategories, also considering the research questions (Table 1).

Table 1. *System of categories and subcategories and their relationship to the research questions*

Research Questions	Categories	Sub-categories of analysis
PI.1. How has the PTT seminar and the A-R cycles focused on the F&SA influenced the development of the research competence of the participating teachers?	1. Influence of the seminar and the A-R on the development of its research competence and on its own practice	1.1. Influence of A-R cycles on the teaching practice and research competence. 1.2. Seminar factors that promote the development of the research competence.
PI.2. What are the main challenges identified by the seminar participants in relation to the development of their research skills and how are these challenges addressed?	2. Challenges of participants in relation to the development of research competence and strategies to address them.	2.1. Identified challenges affecting the investigative competence of participants. 2.2. Strategies to address identified challenges.

2.3 Ethical-methodological issues

Regarding the ethical and methodological issues of the research, measures were taken to guarantee the confidentiality and anonymity of the study participants and ethical principles of integrity have been respected, avoiding any form of manipulation or harm to the participants. In addition, a reflexive and critical stance has been maintained throughout the research process, recognizing possible biases and prejudices that could influence the perception of the data (Bisquerra, 2004). These ethical and methodological considerations were critical to ensure the validity and reliability of the findings, as well as to protect the rights and well-being of participants involved in the research.

3. Results

The results have been organized around the category system created. Therefore, first, the results are presented on the category called: "influence of the seminar and the A-R in the development of its research competence and in its own practice". Below are the results of the category: "Participants' challenges in relation to developing research competence and strategies to address them".

3.1 Promoting the participation of teachers in the research of their own educational practice

The results of this first category are subdivided into two main aspects, according to the proposed subcategories: (1.1.) Influence of A-R cycles on teaching practice and research competence; (1.2.) Seminar factors that promote the development of research competence.

The Lifelong Learning Seminar focused on the F&SA appears to be an appropriate space to encourage the active participation of teachers in the research of their own educational practice, especially with regard to the implementation of F&SA systems. Throughout the seminar sessions, participants proactively engaged in discussions and reflections on F&SA practices in their classrooms.

This commitment and positive attitude in the participants of the seminar towards educational research is also observed in the minutes of the seminar, since their active participation towards research is evidenced in the meetings.

Regarding the influence of the A-R cycles on teaching practice in their research competence, the teachers pointed out that it has allowed them to improve their research competence and acquire a deeper understanding of the challenges and opportunities that were emerging through their own research. In addition, a progressive change in positive attitudes towards F&SA and research was observed, going from a lack of knowledge about both processes in some participants, to having a greater awareness about the importance of investigating their own educational practice to improve it through A-R cycles. The A-R cycles implemented at the F&SA seminar played a crucial role in the development of the research competence of the participating teachers. Throughout these cycles, teachers were immersed in a continuous process of reflection and action, which allowed them to systematically and rigorously investigate their own educational practice.

> The difference between the first and second trimesters is the progression that students have shown both in their involvement in the F&SA and in their learning. It is considered that this progression is mainly thanks to the Action-Research cycles developed as a teacher. (Minutes 8, 2017/2018)

One of the main contributions of the A-R cycles was the promotion of a culture of critical reflection among teachers. By having to question and deeply analyze their pedagogical methods and approaches, participants were able to identify areas for improvement and develop effective strategies to address the challenges they faced in the classroom, especially in the field of F&SA. However, many of them reflect that having questioned their evaluation practices towards the implementation of the F&SA required questioning the rest of methodological aspects of their educational practice. This capacity for self-assessment and self-reflection is a fundamental aspect of research competence, as it allows teachers to critically evaluate their own performance and continuously look for ways to improve.

> It emphasizes that, if necessary, it has used instruments to monitor the Research-Action system to improve both in the current course, and to make changes for the next course. (Act 8, 2021/2022)

In addition, the A-R cycles provided teachers the opportunity to apply in a practical way the concepts and tools learned during the seminar. This direct connection between theory and practice strengthened the understanding of the principles of F&SA and allowed teachers to develop practical skills to carry out educational research in their own contexts.

> It is pointed out that being able to share experiences at different educational stages brings important learning and aspects that can be adapted to the educational stage. As for the theoretical review, the fact of having a theoretical base and being able to deepen in practice about it has provided a lot of information; and it is considered as a very positive aspect. (Act 8, 2020/2021)

Another important aspect was the collaboration and knowledge exchange between teachers during the A-R cycles. By working in collaborative teams, participants were able to benefit from the diverse experiences and perspectives present in the group, which enriched the research process and facilitated the discovery of innovative solutions to educational problems. This collaboration not only strengthened the individual research competence of teachers, but also fostered a sense of group and mutual support in the seminar.

> Teacher1 points out that if we reflect on any aspect of our educational practice, it does not make sense to attend the seminar, since it is necessary that we reach a collective analysis within the A-R process focusing on the three points that the F&SA aims to improve. Teacher2 says that we can share what happens to each of us in the classroom regarding F&SA and encourage collaborative learning of A-R. Teacher3 points out that this is the idea. (Minutes 2, 2020/2021)

Regarding subcategory 1.2, the data analyzed show that the involvement in the seminar promoted the development of the research competence of teachers and their active commitment to the educational research process for different reasons:

- Participants acquired conceptual and methodological tools through the literature review and discussion of practical experiences to address more effectively the challenges they face in their classrooms.
- The debates that took place around the importance of investigating the educational practice promoted a culture of research within the group, from a reflexive and critical approach.
- The presentation of practical experiences and feedback among the participants enriched the collective learning process. In this way they were able to gain different perspectives on the common challenges they face in their respective educational contexts. This horizontal collaboration facilitated the exchange of good practices and the identification of effective strategies to improve F&SA teaching and processes through research.
- The atmosphere of trust and mutual respect at the seminar allowed participants to express their concerns openly and to receive constructive guidance and feedback from other teachers.
- The structure of the seminar, which included practical activities and guided reflection exercises, motivated teachers to apply the concepts and tools learned in their own classrooms. The direct connection between theory and practice facilitated the transfer of knowledge and skills, allowing participants to experience first-hand the impact of educational research on their daily work.

Below are some of the quotes that show the results found:

> Teacher1 points out that it is very enriching to have a working group with all academic levels and the learning has been very good (…) Teacher3 affirms that the positive part of the seminar is the enrichment of the participation of all. (Minutes 8, 2019/2020)

> Teacher1 points out that it is interesting for each person to tell their practice (…) Teacher2 defends that the seminar works very well and enriches a lot to all who participate in it. (Act 8, 2021/2022)

> She emphasizes the importance of working with the action research instrument to continue improving this process and her teaching skills. (Act 8, 2021/2022)

> He mentions that the seminar has been good for him this year, especially the implementation of the research-action data collection tool. (Act 8, 2021/2022)

3.2 Challenges of seminar participants in relation to the development of research competence and strategies to address them

The results of this second category are subdivided into two subcategories: (2.1) Identified challenges affecting the research competence of participants; (2.2) Strategies to address identified challenges.

To give a more complete explanation, it has been decided to relate both categories through table 2, to explain each challenge found along with their strategy to face it. Seminar participants identified a number of challenges in relation to the development of their research competence. To overcome these obstacles and challenges, teachers implemented strategies that are set out in Table 2 and detailed below.

Table 2. *Challenges observed for developing research competence and strategies implemented to solve them*

Challenges encountered for the development of research competence	Strategies put in place to address them
Inexperience in educational research processes and ignorance of the A-R as a research process.	Introductory sessions about the theoretical and practical foundations of A-R. Step-by-step guided practices by seminar coordinators. Tracking of A-R cycles through record sheets for further analysis.
Increase in workload	Group support from the seminar teachers. Logical planning of the times destined to the A-R. Flexibility in the time planning.

One of the most significant challenges identified by the seminar participants was inexperience in educational research, especially regarding the lack of knowledge of A-R systems. Many teachers expressed feeling inexperienced in this regard, especially as they had no previous experience in this type of research methodology. Lack of familiarity with the principles and procedures of A-R was perceived as a major barrier.

> The participant says that is not very clear about the concept of action research and is not aware of whether he applies it or not, but he considers that despite having been doing F&SA processes for a short time, he has realized that he is able to adapt the process to his own progress. (Act 8, 2020/2021)

To address this challenge, various strategies were implemented aimed at providing participants with the tools and support needed to engage in A-R processes. Introductory sessions were held on the theoretical foundations of action research, where key concepts were explained and concrete examples of how to apply this methodology in the educational context were presented. In addition, guided practices were developed, where teachers could conduct the A-R under the supervision of the coordinators of the seminar.

> One of the proposals for improvement that were pointed out at the end of the previous course was to start this course with a basic training on Research-Action, since there is a certain degree of ignorance among the participants of the seminar. Many of them implement it, but they do not systematize it due to ignorance of the process. It is therefore agreed that this training will be provided to all participants for the next meeting. (Minutes 1, 2021/2022)

The last obstacle highlighted by the seminar participants is the increase in workload due to the implementation of A-R cycles. The integration of both processes requires additional time to plan and develop.

To solve this problem, different solutions were proposed: (a) group support by the teachers of the seminar to carry out the A-R processes; (b) planning in a logical way the times specifically destined for developing of A-R cycles from month to month; (c) the teachers were advised to be flexible in their time planning. However, the most experienced teachers in A-R pointed out that this workload decreases as the teaching experience in these practices increases.

> Teacher1 points out that it also seems important to focus on the topics on which you should reflect in a group, to have more group support and generate

> more collective knowledge (...) points out that he believes that what is important is the analysis done in the seminar, and that this analysis is about common data, even if it is in different contexts. (Minutes 2, 2020/2021)

4. Discussion and conclusions

Regarding the first research question: How has the PTT seminar and the A-R cycles focused on the F&SA influenced the development of the research competence of the participating teachers? The results show that the seminar teachers are actively involved in the research and improvement of their own practice. Throughout the course of the seminar, participants proactively engaged in discussions and reflections on F&SA practices in their classrooms. This finding is in line with the idea that the PTT is essential for the professional development of teachers (Domínguez & Vázquez, 2015; Imbernón, 2017). According to Kennedy (2004, 2014), this continuous training fosters the critical and systematic disposition towards the educational practice itself, which materializes through active participation in training processes that promote reflection and self-criticism.

The results seem to show that the systematic realization of cycles of A-R on their own practice helps to develop their research competence and improve their educational practice. This fact is related to the importance of A-R as a PTT proposal (Kennedy, 2004, 2014; Whitehead, 1989). Through the A-R, the teacher assumes the role of researcher and uses the classroom as his/her space of study, encouraging reflection and critical analysis of what happens in the classroom to improve the learning of students and the teaching practice itself (Imbernon, 2019; Latorre, 2003). Likewise, a positive change in attitudes towards research was observed, going from a lack of knowledge about both processes in some participants, to having a greater awareness about the importance of investigating their own educational practice to improve it through A-R cycles.

The A-R cycles implemented at the seminar played a crucial role in the development of the research competence of the participating teachers. One of the main contributions of the A-R cycles was the promotion of a culture of critical reflection among teachers, which aligns with the idea that research in education promotes the professional development of teachers and contributes to practical and institutional improvement (Latorre, 2003). In addition, the A-R cycles provided teachers the opportunity to apply in a practical way the concepts and tools learned during the seminar. This direct connection between theory and practice strengthened the understanding of the principles of F&SA and allowed teachers to develop practical skills to carry out educational research in their own contexts. By adopting A-R as the usual methodology of work and PTT, teachers can develop research skills that allow them to address specific challenges and find strategies to innovate in education, as in this case through F&SA (López-Pastor et al., 2011; Herrero et al., 2021; Pascual-Arias et al., 2023).

Another important aspect was the collaboration and knowledge exchange between teachers during the A-R cycles. This collaboration not only strengthened the individual research competence of teachers, but also fostered a sense of group and mutual support within the seminar, as has also occurred in similar experiences (Marcelo & Vaillant, 2009; Pascual-Arias et al., 2022).

Regarding the second research question: What are the main challenges identified by the seminar participants in relation to the development of their research competences and how are these challenges addressed? The results show that one of the most significant challenges was the inexperience in educational research, especially in relation to the principles and procedures of the A-R. This finding is in line with the importance of strengthening the research competence of teachers to address current educational challenges (Bates & Sagra, 2021; Cobos et al., 2016). To address this challenge, various strategies were implemented, such as introductory sessions on the foundations and procedures, and guided practices, which coincides with the idea that the PTT is essential to effectively access and use new pedagogical knowledge (Kennedy, 2004, 2014).

The last obstacle highlighted by the seminar participants is the increase in workload due to the implementation of A-R cycles. This challenge reflects the need to approach PTT as a guarantee of improvement and not as an additional workload (Domínguez & Vázquez, 2015; Imbernón, 2017; Souto-Seijo et al., 2020). To solve this problem, different solutions were proposed: group support to carry out the A-R

processes; sequenced and guided planning of the A-R cycles from month to month and flexibility in time planning.

The following conclusions stand out: (a) the PTT seminar and the A-R cycles focused on F&SA seem to have positively influenced the development of the research competence of the participating teachers, through their active participation and the acquisition of conceptual and methodological tools to address the challenges of their classrooms; (b) a series of challenges have been identified in relation to the development of the research competence; however, effective strategies were implemented to address them in the meetings held and through the group support of the rest of colleagues.

This article can provide a deeper understanding of how PTT and A-R cycles focused on problems of educational practice, or methodological aspects can strengthen the research competence of teachers, in addition to enhancing the professional development of teachers.

As for the limitations of the study, it could be the low number of participants, as well as the limitation of the studied context, since only a single PTT seminar has been studied. However, we consider that the results found are valid because they demonstrate the reality of this context.

In the future, it could be studied whether these same results can be extrapolated to other PTT seminars, as well as continue to investigate these approaches in educational practice in the long term, focusing on specific topics that can solve the needs of the different educational realities of the participating teachers. It could also be studied how research competence has a positive impact on student learning at different educational stages, all this could be done in future research covering a greater number of contexts in which these practices are carried out.

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Perception of competencies for writing scientific articles in social and human sciences researchers

Percepción sobre las competencias para escribir artículos científicos en investigadores de ciencias sociales y humanas

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Abstract

Considering that scientific writing presents complex challenges, we sought to determine the level of perception that social and human science researchers have about their competencies to write scientific articles, through a cross-sectional descriptive study in which 129 researchers of both sexes with various years of research experience participated. They self-assessed their writing using the Scale for Evaluating Scientific Articles in Social and Human Sciences by López-López, Tobón and Hernández-Juárez (2019), and an overall result of high level in writing competence was obtained, with a significant effect size; scoring highest in the Results and Reference List sections; while the lowest were in Style and Format and Appendices. When comparing writing competence with the variables gender, research experience or the number of books and articles published, no significant differences were found, despite the fact that in this study males presented a greater number of publications. However, the Methodology section, evaluated with the scale, research experience, as well as belonging to the male gender, were the predictor variables for the publication of articles. Finally, it is recommended that more support be given to female researchers and that more methodological training be provided to new researchers in the interest of promoting educational equity.

Keywords: competences, writing, scientific researcher, scientific article, social science, human science.

Resumen

Considerando que la escritura científica presenta complejos desafíos, se buscó determinar el nivel de percepción que tienen los investigadores de ciencias sociales y humanas sobre sus competencias para escribir artículos científicos mediante un estudio descriptivo transversal en el que participaron 129 investigadores de ambos sexos con diversos años de experiencia investigadora. Autoevaluaron su escritura mediante la Escala para Evaluar Artículos Científicos en Ciencias Sociales y Humanas de López-López, Tobón y Hernández-Juárez (2019), y se obtuvo un resultado global de nivel alto en la competencia de redacción, con un significativo tamaño del efecto. Las secciones de Resultados y Lista de referencias obtuvieron las puntuaciones más altas, mientras que Estilo y formato y Apéndices fueron las más bajas. Al comparar la competencia en la redacción con las variables género, experiencia investigativa o la cantidad de libros y artículos publicados, no se encontraron diferencias significativas a pesar que en este estudio los varones presentaron mayor número de publicaciones. Sin embargo, la sección de Metodología, evaluado con la escala, la experiencia en investigación, así como pertenecer al género masculino, fueron las variables predictoras de la publicación de artículos. Finalmente, se recomienda apoyar más a las investigadoras y brindar mayor capacitación metodológica a los nuevos investigadores con el interés de fomentar la equidad educativa.

Palabras clave: competencias, escritura, investigador científico, artículo científico,ciencias sociales, ciencias humanas.

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1. Introduction

Not all researchers have the same competencies to write scientific papers in their own disciplines (Perković Paloš et al., 2022), despite knowing the writing criteria (Gil Calderón, 2024; Giraldo-Giraldo, 2020), while some do quite well (Alzahrani, 2020; Bajwa et al., 2020; Perković Paloš et al., 2022; Ramírez-Castañeda, 2020; Zein et al., 2023), others write with ample opportunities for improvement (Echanique, Portillo 2020; Duvoba et al., 2020; Ganga-Contreras et al., 2022; Trinh et al., 2020).

The latter usually has several reasons: the production of knowledge goes beyond mere intellectuality (Castellaro & Peralta, 2020; Parra & Zarauza, 2021), and there are varied genres of writing with rhetorical demands of its own (Negretti et al., 2022). Therefore, it requires complex competencies to adapt the record, convincing argumentation, correct use of grammar and syntax, content and form to a variety of readers and purposes (Gil Calderón, 2024; Sologuren & Venegas, 2022; Yonai & Blonder, 2020); thus, writing is the place where the researcher demonstrates part of the quality and level of human talent he possesses (Hernández-López & Ataydе-Manríquez, 2021).

These and other challenges of writing are reflected when writing the different sections in the universal structure for writing scientific articles: Introduction, Methodology, Results and Discussion (IMRyD), each of which presents particular challenges for the researcher (Codina 2022; Holgueras-Galán et al., 2023; Nundy et al., 2021; Laitin et al., 2021; Taherdoost, 2022) and for the discipline of knowledge, since each section retains variants of writing according to the discipline and discursive gender (Coto et al., 2020). For example, articles are usually brief in the areas of health, while they are more extended in the Social and Human Sciences, (Perković Paloš et al., 2022).

On the other hand, in the Social Sciences at an international level, pressure has increased to write and publish more articles than books (Mrva-Montoya & Luca, 2021), due to the widespread tendency of researchers to write more books and monographs than articles (Giménez Toledo, 2020). Regarding age and research experience, some studies indicate that, in the Social and Human Sciences, researchers begin by publishing few articles, advance by writing more book chapters and books in the middle ages, until they achieve more books and chapters when they have more experience and age (Savage & Olejniczak, 2021).

By contrast, in other disciplinary fields, women decrease the number of publications as they advance in age and experience due to factors such as taking care of the home, raising children or the prejudices that exist against them (Beaudry et al., 2023). If the phenomenon is analyzed from the approach of how men and women write (Haghani, 2022), in relation to their age (Michiels et al., 2022), or years of research experience (Castelló, 2022; Savage & Olejniczak, 2021), the results will also be diverse (Christ et al., 2021; Beaudry, et al., 2023; Haghani, 2022; Oliveira-Ciabati et al., 2021; Ribarovska et al., 2020; Son Bell, 2022).

As observed, this phenomenon of the competence to write scientific articles has multiple edges, so it is complex to study it due to the amplitude of slopes from which they can be investigated. This complexity is even greater in the case of Latin America, where scientific articles require greater global participation and citation outside the region (Spatti et al., 2021), despite the fact that the impact has been increasing by 1.6% per year (Clarivate, 2023), although it still remains below the world average (Caballero & Fajardo, 2023).

Faced with these and other perspectives, the competence in academic writing (Ponce Carrillo and Alarcón Pérez, 2020) and scientific writing (Sayer, 2019), because they are transversal in the professions (Vieno et al., 2022), in addition to requiring educational planning focused on research (Aldana-Zavala, Vallejo-Valdivieso & Isea-Argüelles, 2021), deserves to be considered within education and permanent training (Muñoz Galeano, 2024), seeking its evaluation within a certain context to accumulate evidence (Castro Espinoza & Castillo Arredondo, 2016), and promote educational equity fair and democratic cooperation between researchers. Therefore, this study aims to: a) determine the competencies to write a scientific article in Mexican researchers assigned to the National System of Researchers in the area of Social and Human Sciences; b) identify whether there are differences in performance to write articles according to gender, research teaching experience, number of articles and books published; and c) determine the impact of competencies to write arti-

cles in the publication of articles, books and book chapters, controlling the effect of research experience, age, gender and other publications.

2. Methodology

2.1 Participants

In this quantitative-descriptive and cross-sectional study, 129 people were selected by convenience sampling from a total of 8033 members of the Social and Human Sciences area belonging to the National System of Researchers of Mexico, who answered a digital form, whose characteristics are indicated in the following section. The average age was 52.7 years (±12.8). 75% are male and 97.68% have a doctorate. They have an average of 22.8 years of experience in teaching and research (±14.6), an average of 56.2 scientific articles (±85.5), 10.0 book chapters (±15.7) and 3.1 books published throughout the professional career of the group (±5.2).

2.2 Instrument

The instrument applied to measure self-perception about writing skills was the *Scale for Evaluating Scientific Articles in Social and Human Sciences-EACSH*. It evaluates the degree of quality in the writing of a scientific article by researchers with different degrees of expertise. The instrument has a reliability of 0.937, and consists of 19 items distributed in eight dimensions: cover and abstract (1-3), introduction (4, 5), methodology (6-9), results (10-12), discussion (13-16), references (16), appendices (17) and style and format (18, 19). It was validated in content and construct by López-López et al. (2019); each item is valued with five levels: very low, low, medium or acceptable, medium high and very high, and responds on average in 12.5 minutes. When validated, eight factors were found by exploratory factor analysis. The same applies to the confirmatory factor analysis carried out in this investigation, whose goodness of fit criteria are shown in Table 1.

Table 1. *Goodness of fit of EACSH*

Adjustment rates	Recommended value	Value obtained
Chi-square (χ^2)	Non-significant	269, $p < 0.001$
Degrees of freedom (gl)	--	126
Chi-reduced square (χ^2/gl)	< 3.0	2.14
Tucker–Lewis index (TLI)	> 0.90	0,860
Comparative Adjustment Index (CFI)	> 0.90	0,897
Mean Quadratic Error of Approach (RMSEA)	< 0.08	.094

Note: Recommended values based on Hair et al. (2014).

2.3 Statistical analysis

First, a descriptive analysis of the information was carried out, determining the percentages of the performance level of the researchers with respect to the quality of the writing of scientific articles in each dimension of the *EACSH*. Then, it was analyzed by a *t*-test for a sample if the performance in the eight dimensions was lower or higher than the theoretical median of 3.0, which is the mean or acceptable value. It was also sought to determine the existence of significant differences between the performance to write articles according to gender, the research teaching experience, the number of articles and books published. A Welch *t* test was used for the gender variable, and analysis of variance (ANOVA), for the other cases. In each ANOVA a *post-hoc* test was used to evaluate differences between specific groups, using the Tukey method after determining compliance with the assumption of homoscedasticity with a Levene test.

Although the assumption of normality is not met, parametric tests were used, since various studies show that both the *t* test of Welch (Delacre et al., 2017; Guiard & and Rasch, 2004; Rasch et al., 2011) and the ANOVA (Blanca et al., 2017; Delacre et al.,

2019; Nguyen et al., 2019) are robust to the violation of the assumption of normality in large samples that comply with the assumption of equality of variance. In fact, the disadvantages of switching to non-parametric tests far outweigh their advantages, especially with the possibility of making type I error. In all cases, parametric test results were compared with their non-parametric counterparts (Mann-Whitney U and Kruskal-Wallis, respectively), with no differences in the analyses obtained. For ease of interpretation, only parametric test results were reported. Finally, linear regression was performed to evaluate the impact of the different dimensions of writing on the publication of articles, books, and book chapters, controlling various sociodemographic factors (years of research experience, age and gender). All data was processed using Jamovi statistical software, v2.3.18.

3. Results

First, the levels obtained in the writing of articles were evaluated, both in general and by dimensions of the article. To measure whether the results differed statistically from a mean self-assessment, a sample t-test was used, comparing the averages obtained with the theoretical mean of the instrument (value = 3). In general, it was found that the level of writing of the researchers was high, with significant differences with respect to the theoretical mean of the instrument, and a large size of the effect measured by Cohen's d, which ranged from 1 to 2 standard deviations of the mean value. The writing of Results and List of references is seen as the greatest strengths, while the greatest opportunities are in the writing of Style and Format and Appendices (Table 2).

Table 2. *Means obtained in the self-evaluation of the competences to write and difference with the theoretical mean*

Dimension	Average	Standard Deviation	Test		Effect Size		
			Statistic	Value	Cohen's d	Upper limit	Lower limit
Abstract Portfolio	4.36	0.676	22.8	< .001	2.01	1.71	2.31
Introduction	4.40	0.787	20.2	< .001	1.78	1.50	2.06
Methodology	4.43	0.686	23.6	< .001	2.08	1.77	2.39
Results	4.51	0.656	26.1	< .001	2.30	1.97	2.63
Discussion	4.43	0.688	23.6	< .001	2.08	1.77	2.39
Reference List	4.67	0.700	27.1	< .001	2.38	2.04	2.72
Appendices	4.08	1,005	12.2	< .001	1.07	0.85	1.29
Style and format	3.85	0.792	12.2	< .001	1.07	0.85	1.29
Escalatotal	4.35	0.582	26.4	< .001	2.33	1.99	2.66

Note. The upper and lower limit of the effect size was calculated with a 95 % confidence interval.

There were no differences between genders in research experience, nor in the number of books and chapters published. The only relevant difference was in the number of published articles, as men published significantly more articles (mean = 65.0) compared to women (mean = 32.5; t(123.6)=2,920, p = .004, Cohen's d = .455).

Table 3 shows some Pearson correlations obtained between the variables of publication of articles, books and chapters, and some sociodemographic variables such as research experience and age. The results showed that the research experience correlated with both age, as expected, and with the three types of publications, albeit with variable effect sizes. For example, the relationship between research experience and publication of articles was stronger (r = .470, p < .001) than between research experience and book chapter publication (r = .294, p < .001). To prevent publications of one type from interfering with the correlations of another, the analyses were replicated, this time controlling the effect of other types of publications in each case. In this second round of analysis, only the publication of articles (rp = .419, p < .001) maintained a strong relationship

with the research experience. The publication of chapters had a weak relationship with research experience (rp = .179, p = .044), while the publication of books (rp = .148, p = .097) no longer showed a significant relationship with research experience.

Table 3. *Correlations between sociodemographic variables*

		1	2	3	4	5
1	Experience in research	-				
2	No. of published articles	.470***	-			
3	No. of books published	.342***	.285**	-		
4	No. of published chapters	.294***	.131	.462***	-	
5	Age	.884***	.606***	.352***	.310***	-

Note: * p < .05; ** p < .01; *** p < .001

Subsequently, the differences between the means obtained in each dimension of the instrument and the total score were evaluated according to the variables gender, years of research experience, and number of articles and books published (table 4).

Table 4. *Level of writing of articles by dimensions and criteria*

Criteria	Cover	Introduction	Methodology	Result	Disc.	Refer.	Appendix	Style	Total
Gender									
Femenine	4.41 (.568)	4.55 (.529)	4.55 (.570)	4.53 (.469)	4.45 (.672)	4.56 (.801)	4.28 (.813)	3.89 (.801)	4.42 (.444)
Masculine	4.34 (.717)	4.35 (.859)	4.38 (.722)	4.50 (.713)	4.43 (.699)	4.69 (.670)	3.99 (1,057)	3.85 (.796)	4.33 (.628)
Research experience									
0-9 years	4.41 (.601)	4.67 (.416)	4.60 (.510)	4.62 (.506)	4.39 (.698)	4.63 (.839)	4.15 (.989)	3.81 (.798)	4.44 (.466)
10-19 years	4.20 (.578)	4.21 (.824)	4.25 (.662)	4.35 (.660)	4.44 (.630)	4.65 (.608)	3.84 (1,003)	3.81 (.803)	4.23 (.546)
20-29 years	4.37 (.647)	4.28 (.924)	4.35 (.655)	4.50 (.518)	4.49 (.610)	4.85 (.366)	4.25 (1.118)	3.95 (.686)	4.36 (.508)
30 years or older	4.42 (.776)	4.42 (.833)	4.47 (.777)	4.56 (.761)	4.43 (.758)	4.63 (.774)	4.12 (.973)	3.85 (.838)	4.38 (.681)
No. of published articles									
0 to 14	4.27 (.567)	4.39 (.687)	4.47 (.630)	4.45 (.643)	4.33 (.685)	4.57 (.778)	3.71[a] (1.152)	3.64 (.879)	4.28 (.519)
15-39	4.42 (.528)	4.54 (.605)	4.43 (.584)	4.59 (.470)	4.63 (.450)	4.84 (.442)	4.38[a] (.794)	4.04 (.491)	4.47 (.389)
40-99	4.39 (.677)	4.39 (.899)	4.33 (.638)	4.48 (.527)	4.37 (.761)	4.67 (.645)	4.12 (.893)	3.97 (.770)	4.34 (.581)
100 or more	4.33 (.986)	4.21 (.988)	4.48 (.954)	4.51 (1.015)	4.36 (.852)	4.54 (.932)	4.08 (1,100)	3.69 (.987)	4.31 (.866)
No. of published books									
0 to 4	4.31 (.703)	4.38 (.819)	4.39 (.712)	4.51 (.676)	4.40 (.723)	4.69 (.722)	4.04 (1,050)	3.82 (.831)	4.33 (.613)
5-9	4.74 (.288)	4.72 (.667)	4.77 (.312)	4.62 (.460)	4.68 (.409)	4.33 (.707)	4.33 (.707)	3.94 (.527)	4.58 (.313)
10-14	4.57 (.575)	4.50 (.632)	4.52 (.668)	4.28 (.799)	4.62 (.527)	4.83 (.408)	4.17 (.983)	4.00 (.837)	4.44 (.517)
15 or more	4.44 (.576)	4.25 (.535)	4.45 (.628)	4.55 (.499)	4.46 (.529)	4.63 (.518)	4.25 (.707)	4.00 (.463)	4.39 (.416)

Note. For comparing gender means, Welch t was used; for the rest of the analyses ANOVA was used. The values in parentheses correspond to the standard deviation. PORT = Cover and abstract; INT = Introduction; MET = Methodology; RES = Results; DIS = Discussion; REF = References; APE = Appendices; EST = Style and Format; TOT = Total Scale. There were no statistically significant differences in the t-tests or ANOVA. In post-hoc comparison (Tukey), only differences were found between (a) the Appendices means, for researchers with 0 to 14 published articles and researchers with 15 to 39 published articles.

In general, no differences were observed in any of the variables considered; although in the *post-hoc* tests a significant difference emerged between the means of the Appendices dimension between researchers with fewer than 15 published articles, and those between 15 and 39. However, this differen-

ce disappears at higher publication ranges. It is interesting to note that, in the dimensions Introduction, Methodology and Results, it is the researchers with less years of experience who are best evaluated, although there is no significant difference with the other ranges of research experience.

Finally, the impact of each dimension of the instrument in terms of the publication of articles, books and chapters was evaluated through linear regression, controlling the influence of age, gender, years of research experience, and other publications (table 5). Again, the results suggest a better fit of the model for the publication of scientific articles, which explained 51.4% of the variance, while the book and chapter publication models explained 23.4% and 20.1%, respectively. In the case of the article publication model, in the control variables, both research experience ($\beta = .505$, $p = .001$) and gender ($\beta = .153$, $p = .035$) had a positive impact on the number of publications. In general, the self-evaluation dimensions of the scientific writing had a limited impact, excepting the Methodology ($\beta = .238$, $p = .035$), which is the only one that appears as significant. It is noteworthy that the dimension Appendices ($\beta = .152$, $p = .067$) also shows an interesting impact, close to statistical significance.

As for book and chapter publishing models, no dimension appears to have significant impact, although in the case of the chapter publishing model, the Introduction dimension has an impact close to statistical significance ($\beta = .201$, $p = .084$). It is interesting to note that there seems to be a mutual dependence on book and chapter publishing models. For example, in the book publishing model, the most impactful variable is chapter publishing ($\beta = .364$, $p < .001$). Also, in the chapter publication model, the variable with the greatest impact is book publication ($\beta = .380$, $p < .001$). Therefore, although both are two different types of publications, they have a close relationship not shared with the publication of articles, which seems to work with a different logic from a requirements perspective based on the variables considered in the present study.

Table 5. *Linear regressions to evaluate the impact of instrument dimensions on article, book and chapter publications*

	Published articles		Published books		Published chapters	
Variables	**B**	**p**	**B**	**p**	**B**	**p**
Cover	- 052%	.638	.194	.140	- 032%	.813
Introduction	- 044%	.650	- 162%	.155	.201	.084
Method	.238	.035	.002	.989	- 041%	.770
Results	- 005%	.958	- 130%	.288	.101	.420
Discussion	- 081%	.412	.117	.313	-.009	.943
References	- 042%	.671	-.129	.271	- 114%	.338
Appendices	.152	.067	-.016	.875	.096	.345
Style	- 053%	.625	.088	.497	-.013	.920
Research experience	.505	.001	- 078%	.676	.109	.569
Age	.126	.408	.195	.278	.162	.379
Gender	.153	.035	.065	.453	.098	.271
Published articles	-	-	.173	.129	-.099	.394
Published books	.123	.129	-	-	.380	<.001
Published chapters	- 068%	.394	.364	<.001	-	-
F	8.80***		3.85***		3.34***	
R^2	.717		.317		.287	
R^2 adjusted	.514		.234		.201	

Note. *** $p < .001$

Discussion and conclusions

The first objective of the study was to describe the researchers' self-assessment of their competence to write the different dimensions of scientific articles. In this regard, it was found that, on average, they showed high scores in Results and List of references. This finding in Results is similar to what Colombian researchers obtained (Ramírez-Castañeda, 2020), probably because they are the ones who are familiar with the data; they have processed it, they know it in detail, they can interpret it and, therefore, they have the domain to translate and communicate the findings.

The opposite is true of Filipino researchers. They have the greatest weakness in writing in their own language (Echanique & Portillo, 2020), as well as the Social Sciences researchers of Latvia (Duvoba et al., 2020). This difficulty can be caused by the scarce research experience they have as the sources point out (Duvoba et al., 2020; Echanique & Portillo, 2020). However, it is important to note that in the Mexican sample, this difference was not observed according to experience. In fact, in Introduction, Methodology, and Results, researchers with less experience (0-9 years) had a higher average score (Introduction: 4.67; Methodology: 4.60; Results: 4.62) than the most experienced, who lowered the average in the group of 10 to 19 years (Introduction: 4.21; Methodology: 4.25; Results: 4.35), and were increasing progressively to those with more experience (more than 30 years; Introduction: 4.42; Methodology: 4.47; Results: 4.56), although these differences were not significant.

The similarities and differences found may mean several interpretations. Not all researchers have the same difficulties-facilities when writing the different sections of the article. The language in which they write is also not important, as Philippines and Mexicans wrote in their native language, while Colombians wrote in English. Even less so, the characteristics of the journal in which they submit their works, as well as the subject they develop, determine that the writing is easy or difficult. The important thing is the writing of the section itself, as each presents its own challenges and requirements. Some studies claim that of all sections, the Discussion may represent the greatest challenge due to its argumentative nature in relation to the findings and their meaning (Lele-Rozentale et al., 2021). Precisely, in the Discussion, the average obtained increased with experience, and stabilized in the groups with more experience. Again, these differences are not statistically significant, but they set a striking pattern.

The result in List of references seems to indicate that researchers are aware that properly constructed references play an important role in locating the cited sources and assessing the quality of the research. In addition, it is the section that the journals' databases use to index the article, obtain the h-index and the identity of the authors and the journals cited in the article (Aksnes et al., 2019; Mammola et al., 2021). Knowing these values, it may be of the reasons why Mexicans put dedication and attention in the elaboration of this section.

The Methodology, little smaller than the previous two dimensions, continues to show a large size of the effect when compared with the theoretical mean of the instrument. This good performance can be because the researcher is the one who designs the study with a high degree of accuracy, the procedure and the possible solutions to the difficulties found. In contrast, Vietnamese researchers barely develop this section in their articles (Trinh et al., 2020), because they are new to the world scientific writing; while this section cannot be evaluated in Argentinian Social Science articles because journals do not adjust articles to the IMRyD in these disciplines (Piovani, 2019).

In this study, Mexican researchers showed greater opportunity for improvement in Style and Format, and Appendices. In relation to the first, there are several possible explanations. One is that most do not use reference managers to format articles because they are elderly people with an average age of 53 years, as happened with most researchers in Ghana, revealing not to use such managers and also an average of 51 years old (Bugyei et al., 2019).

Although this does not explain why a better result was obtained in List of references, another possibility is that journals, although based on standardized rules of style and format, have their own slight variants but that produce serious deviations from the norm that generate rejection by journals as happened with 65% of Latin American articles submitted for publication (Ganga-Contreras et al., 2022). Finally, we cannot rule out that some authors write their articles before identifying a journal without strictly adhering to publication standards. As for Appendices, probably the opportunity for

improvement is because the section is for complementary material of the article (Nikolov, 2022), so they better concentrate on writing the relevant content. If so, when responding to the scale, researchers probably did not give both dimensions the necessary importance to the corresponding items.

The second objective sought to determine whether there were significant differences in the quality of writing by gender, research teaching experience and the number of articles and books published. In general, there was no significant difference in being male or female; similar to the finding of Sword et al. (2020) with researchers from various countries, in which gender did not play a statistically significant role. However, there are studies that present some editorial differences such as that of Boettger and Wulff (2019): women wrote with more adverbs and passive verbs than men; although they agreed to use the same style markers in their rhetoric. Therefore, the difference seems to lie more in the style than in the quality of the writing, writing freely, although retaining already established criteria; relevant characteristics in expert researchers of different disciplines (Dorfler & Eden, 2019).

Regarding the writing of scientific articles and the research teaching experience, no significant differences were found, although the levels (0-9 years of experience) scored slightly higher in Introduction, Methodology, and Results than the other groups. It is possible that this higher self-assessment is related, precisely, to the lack of experience and opportunity to observe other experienced researchers, as well as to the absence of being immersed in various scenarios to receive feedback and stimuli about their writings. These factors, if reversed in opportunities, will be ideal means to develop self-efficacy and confidence when writing scientific articles (Mason & Merga, 2021). Researchers with 30 or more years of experience, while similarly self-evaluating, probably have a higher, more complex level of writing and self-critical thinking, and a tendency to strive for greater excellence (Negretti et al., 2022).

Regarding the publication of books and articles, no significant differences were found. Perhaps, because competing for funding on an international scale requires writing high-standard and quality articles and projects (Yonai & Blonder, 2020). Therefore, researchers are aware of the relevance of good writing. Another explanation is that scientific writing is so specialized that it has a relatively standardized style to communicate the different phases of research, which becomes challenges without margins of options (Da Silva, 2022).

However, a difference was found in Appendices in the *post-hoc* tests for those who had published between 0 and 14 articles compared to those who published between 15 and 39 articles. One possibility of the phenomenon is that, by increasing the number of publications, it also increases the amount of relevant information that can be included in an Appendix. This differs from Supplemental Material which includes a hyperlink that redirects the reader to a digital repository hosted on the journal's website (Taber, 2016). This is an attractive alternative for young researchers, as authors who use it are cited more frequently (Taylor & Francis Group, 2023).

There was also a difference between publishing scientific articles, books and book chapters. On the other hand, although there is a strong relationship between research experience and the publication of articles, the same does not happen with the publication of books, but to a lesser extent, with the publication of chapters. Regarding the publication of books, some claim that it is the most relevant aspect in Social Sciences (Engel et al., 2018), while others consider that all starts by publishing few articles, then more books and book chapters as they advance in research experience (Savage & Olejniczak, 2021). This relationship invites to think that theoretical or reflective elements that do not require much research experience are included, so that neophyte researchers find in this space a freedom of writing not present in scientific journals. Or, that the editorial process includes revisions, sometimes less rigorous, that allow entering the world of academia. Finally, perhaps the most experienced researchers may feel that this is a safer space to invite novice researchers to collaborate for greater editorial freedom, without harming their larger investigations. Whatever the reason, it is a finding that needs to be reviewed in more detail in future research.

Thirdly, the impact of the different dimensions with respect to writing in the publication of articles, books, and chapters was evaluated, controlling the effect of research experience, gender, age, and other types of publications. The results showed that a high score in the ability to write the Methodology is essential in order to publish articles. This is

interesting, because some editors and reviewers of journals consider this section, along with gender and research experience, as relevant for the acceptance or rejection of the article (Ganga-Contreras et al., 2022; Suárez-Amaya et al., 2019). Concluding that, the more research experience, the more articles published; and being male increases the probability of publishing given the prevailing male bias, despite efforts to maintain balance (Franco et al., 2021; Oliveira-Ciabati et al., 2021).

The publication of books and chapters has a positive impact on each other, i.e. the publication of books positively influences the publication of chapters, and vice versa. This fact was also demonstrated by Savage and Olejniczak (2021). On the other hand, gender, research experience and dimensions of scientific writing were not significant. Neither did the publication of scientific articles affect the number of books or chapters published, nor did they significantly impact the number of articles published. This reinforces the idea that these are two distinct types of publications in this sample.

In conclusion, although researchers value positively their skills to write scientific articles, they have areas for improvement regardless of gender, age, research experience, number and type of publications. On the other hand, the main contribution of this study is that the Methodology, the investigative experience and being male are revealed as the predicting variables of the publication of articles. The factors studied lead to recommend greater support to female researchers and provide greater methodological training to seek educational equity, a democratic citizenship that promotes the social, cultural, economic and professional development of research.

The practical contribution of this study is to clarify how Mexican researchers of high level of Social and Human Sciences write, providing glimpses of the level of writing skills when comparing their performance with researchers from other countries. It has as strength the size of the sample that is wide, as well as its exploratory and descriptive character. One of the weaknesses is the intentional sample collected, reason for which the results cannot be generalized. It is therefore recommended to (a) replicate the study and, as far as possible, select the researchers by probabilistic sampling; (b) compare the results with high-level researchers from other countries, regions of Latin America, and other continents; and (c) replicate the study with early career and long-term researchers.

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Research competence in post-compulsory secondary education (baccalaureate)

Competencia investigadora en educación secundaria postobligatoria (bachillerato)

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Abstract

Research competence is a crucial cross-cutting skill in the baccalaureate stage (post-compulsory secondary education), which is specifically developed and assessed in subjects such as "Research Project," taught in Catalonia and other Spanish autonomous communities. The aim of this study was to investigate the perception of both baccalaureate students and teaching staff regarding the development of cross-cutting and specific research competencies through Research Project. To achieve this a research approach was carried out, which included the application of an ad-hoc questionnaire and in-depth interviews. The research sample comprised 1496 baccalaureate students from Catalonia and 15 teaching staff members who were tutors for Research Project. Among the most relevant findings, the alignment in the perception of both groups stands out. Both students and teachers primarily identify the development of competencies related to information search, critical thinking, and self-learning. However, students show a greater disagreement regarding the development of skills such as creativity, leadership, and decision-making. These results suggest that Research Project represents a valuable opportunity to foster the development of research competence. However, it is emphasized the importance of promoting this competence in a cross-cutting manner, both in the work carried out in the various curricular areas of baccalaureate and in prior education throughout secondary education.

Keywords: secondary education, baccalaureate, research competency, cross-cutting competencies, scientific literacy, research project.

Resumen

La competencia investigadora es una habilidad transversal crucial en la etapa de bachillerato (enseñanza secundaria postobligatoria) que se desarrolla y evalúa específicamente en asignaturas como el "Trabajo de Investigación", impartido en Cataluña y otras comunidades autónomas españolas. El objetivo de este estudio fue investigar la percepción tanto del estudiantado de bachillerato como del profesorado tutor sobre el desarrollo de competencias transversales y específicas de investigación a través del Trabajo de Investigación. Se llevó a cabo una investigación que incluyó la aplicación de un cuestionario diseñado ad hoc y entrevistas en profundidad. La muestra de la investigación abarcó a 1496 estudiantes de bachillerato y a 15 docentes tutores/as. Entre los hallazgos más relevantes, destaca la coincidencia en la percepción de ambos grupos. Tanto estudiantado como profesorado identifican principalmente el desarrollo de competencias relacionadas con la búsqueda de información, el pensamiento crítico y el autoaprendizaje. Sin embargo, los estudiantes muestran un mayor desacuerdo en cuanto al desarrollo de habilidades como la capacidad creativa, el liderazgo y la capacidad de elección. Estos resultados sugieren que el Trabajo de Investigación representa una oportunidad valiosa para fomentar el desarrollo de la competencia investigadora. No obstante, se subraya la importancia de promover esta competencia de manera transversal, tanto en el trabajo realizado en las diversas áreas curriculares del bachillerato como en la enseñanza previa durante toda la educación secundaria.

Palabras clave: enseñanza secundaria, bachillerato, competencia investigadora, competencias transversales, alfabetización científica, proyecto de investigación.

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1. Introduction

To build a sustainable future and a democratic society based on social justice, new imaginaries that conceive education as a public project and a common good are necessary (UNESCO, 2015, 2022). Education, in all its stages, must offer spaces for constructing ways of knowing, acting and being in the world that contribute to overcoming the current worldwide crisis. This implies approaching education from a competent and comprehensive perspective, but away from its more neoliberal orientation, guided by the framework of human rights and the revisited foundations of critical and humanist pedagogy.

Within this framework and based on the Budapest Declaration (1999), scientific literacy is essential to achieve full citizen participation and to respond to the social challenges that we must collectively overcome. Although the notion of scientific literacy has a long history (Bybee, 1997; Cañal, 2004; Hurd, 1958), it is polyhedral (Kemp, 2002) and sometimes questioned (Gil & Vilches, 2006). Today it is widely known that it is not enough to acquire scientific knowledge, but rather to develop ways of reasoning and acting in everyday situations where science and technology are present for informed decision-making (Almeida et al., 2022; Romero-Ariza, 2017). However, its teaching cannot be reduced to a technical orientation, but must be approached from a critical perspective (Torres & Solbes, 2016) and include its syntactic or epistemological dimension (García-Carmona & Acevedo, 2018; National Science Teaching Association, 2020), otherwise it will be highly unsuccessful for the common project mentioned above.

By highlighting the importance of its application in everyday situations, close to the reality of the students, its competence approach is reinforced, which is why scientific competencies are also discussed (OECD, 2023). According to the recommendations of the Council of the European Union (2018) on key competencies for inclusive and quality learning throughout life, scientific competence should be understood as the ability to "explain the natural world using the set of knowledge and methodology used, including observation and experimentation, in order to raise questions and draw evidence-based conclusions" in addition to "understanding the changes caused by human activity and the responsibility of each individual as a citizen". In the Spanish context, this framework has been adopted by the current educational legislation, the LOMLOE (Organic Law amending the Organic Law of Education), which considers that scientific competence must be developed throughout the entire process of schooling as a key competence. This is consistent with research on the subject, where it is considered that research training cannot be relegated only to higher education (Akerson et al., 2011; Curran & Kitchin, 2019; Menoyo, 2020). However, it is also important to point out the existence of critical voices that argue that the new curriculum derived from LOMLOE does not sufficiently address this competition (García-Carmona, 2022).

In Catalonia, within the post-compulsory secondary stage, all high school students must carry out a Research work (hereinafter, Rw), with the aim of developing research competence and understanding the fundamental elements of the scientific method. However, in addition to Catalonia that pioneered this practice in 1998, four other autonomous communities have incorporated research work into their curriculum: in the autonomous community of Murcia it was done experimentally in 2007 and became mandatory in 2010; in the autonomous community of Castilla y León it was introduced as a specialized option in 2012; in the autonomous community of Madrid it was offered optionally in the program of excellence in Baccalaureate since 2012; and, recently in 2022, the same Catalan proposal has been introduced in the Balearic Islands in all modalities of Baccalaureate. In the rest of the Spanish territory, the research works in the baccalaureate stage are carried out exclusively on the initiative of the teachers, either individually or at the center level, without a specific regulatory framework.

According to Article 18 of Decree 171/2022 of September 20, on the organization of high school education (in Catalonia), RW requires structured activities that students carry out applying the scientific method to investigate a specific subject, receiving tutoring by teachers. This work represents one tenth of the final note of this stage, align with one of the main objectives of the Baccalaureate related to "understanding the fundamental elements and procedures of research and scientific methods" (RD 243/2022).

This initiative is very relevant, since it is one of the few structured initiatives that deal with scientific competence in secondary education in a transver-

sal way. However, we found an absence of research around this, probably due to its specificity (Ferrés et al., 2015; Menoyo, 2020). Moreover, despite the important tradition of study in the didactics of science in pre-university stages, there is little research on the development of scientific competence in post-compulsory secondary education through transversal didactic proposals. In this regard, it is evident that there is a need to examine how this initiative contributes to the development of scientific competence.

Based on the evidence available in other areas, we can distinguish between different factors that are involved in the development of this scientific competence: (a) specific research competencies; (b) transversal competencies; and (c) attitudes towards science. In this article we will address how RW contributes to the development of the first two, leaving in a second term attitudes towards science, despite its relevance and interest (Muñoz et al., 2019; Palacios, 2021).

On the one hand, the specific research competencies refer to the actions involved in the research process and the communication of the results obtained (Franco-Mariscal, 2015; Rubio et al., 2018). Within the new scientific competency framework proposed by the OCDE (2023), this corresponds to the sub-competence of "constructing and evaluating designs for scientific inquiry and interpreting scientific data and evidence in a critical way". In a more detailed analysis, the proposal presented by Payá et al. (2018) stands out for its exhaustiveness in describing eight dimensions involved: 1) the definition of the problem; 2) the conceptual framework; 3) the planning and execution of the research methodology; 4) the structuring of the results obtained; 5) the formulation of relevant conclusions; 6) the drafting of the report; 7) the dissemination of the main results obtained; and 8) the consideration of ethical and social aspects in the research process.

On the other hand, there are transversal competencies that are interconnected with the research process and are necessary for its correct deployment, but that are not specific to it, but are useful for other situations. In other words, as called by Menoyo (2020) life competencies, related to four domains: (1) scientific integrity and responsibility; (2) solution capacity; (3) entrepreneurship; and (4) self-regulation.

In this regard, the relevance of investigating how the Research Work contributes to the development of both categories of competencies is evidenced, considering the perspectives of the two main actors involved in its conduction: the students and the tutor teachers. In summary, the article addresses the following research objective: to analyze the perception of high school students and tutor teachers on the development of specific and transversal research competencies through the elaboration of the Research Work.

2. Methodology

We opted for a methodological approach that combines both quantitative and qualitative strategies for obtaining information. This approach allowed to obtain a multidimensional vision of the studied phenomenon and to understand it in its globality. With the quantitative strategy, a deductive and extensive collection of information in the students is intended, while the qualitative one is oriented to collect the interpretations that the teaching group attributes to the development of the research competence of the students.

2.1 Information collecting tools

To understand the students' perception of the development of research competence, a scale was designed aligned with the approach proposed by the OCDE and other theorists, understanding these as a set of specific competencies specific to the research action, aligned with the logics of the scientific method and its processes (OCDE, 2023; Payá et al., 2018; Rubio et al., 2018; Valdés et al., 2013). On the other hand, to explore the perception of transversal competencies, a scale was designed under the approach proposed by Menoyo (2020) on life competencies. Both scales were structured in a five-point Likert format (5 "I totally agree", 4 "I agree", 3 "neither agree nor disagree", 2 "I disagree" and 1 "I totally disagree").

The research competence scale contains 14 items that address two main aspects: actions of the research action, and communication of the results obtained. Meanwhile, the cross-competency scale contains 13 items that address four cross-competency sets: scientific integrity and accountability; decisiveness; entrepreneurship; and self-regulation.

Both scales were subjected to a content validation process through a trial of experts, with the participation of eight university professors who are experts in research methods and competencies. In addition, a pilot test was carried out in which participated 31 high school students from a public institute located in the metropolitan area of Barcelona, who had completed their Research Work. It is worth mentioning that these students were not included in the study sample.

The scales showed good reliability, evaluated by Cronbach's Alpha internal consistency index (Nunnally & Bernstein, 1994), with a value of 0.92 for the research competence scale and 0.93 for the transversal competence scale.

The application of the scales was carried out online to the group in December 2021. All participants were informed about the objectives of the study and their responses were anonymous, as was their exclusive use for research purposes.

In order to know the perception of teachers, a semi-structured interview was developed consisting of 20 questions, which answered a network of previously defined deductive categories. Below are the questions raised in the dimension "research competencies", which have been the object of analysis in this work:

- What do you think research work offers to the formation of high school students?
- What research competencies do you think the student can acquire when doing the research work?
- Do you think students are aware of these learnings?
- The research competence is a transversal competence, do you think that enough work is done in the different curricular areas?

2.2 Sample of participants

The sample of the participating students was 1496 high school students, from various institutes in Catalonia. A non-probabilistic sampling was used for convenience, considering representativeness criteria of the four Catalan provinces (47.2% of the metropolitan area of Barcelona, 23.5% of the regions of Girona, 8.8% of Tarragona, 7% of central Catalonia, 3.9% of Ponent and 0.6% of the Terres de l'Ebre). The median age was 17 years, with 61% of students being male, 36.6% female and 2.4% non-binary. With regard to the ownership of the centers, 73% were public and 23% agreed. As for the type of baccalaureate course, 49.8% belonged to the scientific-technological field, 44.1% to the humanistic-social and 6.1% to the artistic.

As for teachers, the sample corresponded to 15 high school teachers from different institutes in the province of Barcelona, specialists in different subjects or curricular areas (Catalan, English, chemistry and physics, natural sciences, social sciences and humanities). The only inclusion criterion was to be a teacher or have had previous experience in RW tutoring. The selection was made by means of an intentional or convenience sampling, considering the possibilities of access to the field of study by the research team and depending on the adaptation level of the objectives of the study.

2.3 Data analysis

Central trend indices (averages and standard deviations) were calculated for the quantitative analysis of the scales using the SPSS statistical program, in its version 24.

The analysis of qualitative data from interviews was carried out using the content analysis strategy (Krippendorff, 2002). Through this analytical method, the information obtained was classified into a system of categories (both deductive and inductive) that shows all aspects of the studied reality and assigns them a new meaning. As a support tool for managing all qualitative information, the ATLAS.ti program was used, in its version 22.

3. Results

3.1 The Student Perspective

Regarding the perceptions about the research competencies developed thanks to the Research Work (RW), as detailed in Table 1, a moderate development is observed. Scores on a scale of 1 to 5, range from 3.2 to 3.8, receiving the highest perception of development competencies review of bibliographic sources, writing through a formal record and discussion of the data analyzed. On the other hand, the sample slightly disagrees with having developed competencies related to the formulation of signi-

ficant research questions, emotional management when speaking in public or in academic writing with scientific rigor and without spelling errors.

Table 1. *Average scores of the "research competencies" scale perceived by the student with the conduction of the Research Work*

Elements	Score
Review of bibliographic sources	3.8/5
Drafting by means of a formal register	3.7/5
Discussion of the analyzed data	3.7/5
Consistency in the wording of the work	3.6/5
Selecting relevant information	3.6/5
Searching for rigorous scientific sources	3.6/5
Argumentative capacity	3.6/5
Digital Competence	3.6/5
Knowledge of office package	3.5/5
Oral communication	3.5/5
Building data collection tools	3.4/5
Academic writing with scientific rigor and without spelling errors	3.4/5
Emotional management when speaking in public in defense of work	3.3/5
Formulation of significant questions for the scientific-professional field	3.2/5
Overall result	3.5/5

In terms of transversal competencies, the results obtained reflect an average agreement in the perception of their development after the conduction of the Research Work (RW), with a total average even lower (3.3 on a scale of 1 to 5) than the scale of research competencies. Competencies perceived as more developed are autonomous learning, critical ability and reasoning ability, as shown in Table 2. On the other hand, the skills that are perceived as less developed are creative ability, leadership and choice, which are linked to personality qualities on which the conduction of RW does not have any influence.

Table 2. *Average scores on the scale of "transversal competencies" perceived by the student with the conduction of the Research Work*

Elements	Score
Autonomous learning	3.7/5
Critical Capacity	3.5/5
Ability to reason	3.4/5
Scientific and research integrity	3.3/5
Entrepreneurial capacity and proactivity	3.3/5
Adaptability	3.3/5
Resolving capacity	3.3/5

Elements	Score
Responsibility	3.2/5
Self-discipline	3.2/5
Self-assurance	3.2/5
Ability to choose	3.2/5
Leadership Capacity	3.1/5
Creative ability	3.0/5
Overall Score	3.3/5

3.2 The faculty perspective

According to the data obtained, the student develops various research competencies throughout the conduction of the Research Work (RW). In this article, only the results belonging to the macro-categories of specific research competencies and transversal competencies are exposed. The units of meaning (UM), which support the interpretations made by the research team, include a numerical reference to identify the participant subject (example, P1=Participant 1).

3.2.1 Specific powers of the act of investigation

The information from the metacategory "specific research competencies" (n=56) indicates that the high school students, at the end of the process of elaborating their research work, have acquired a better understanding of what research requires, i.e. they manage to develop knowledge and basic skills in the different dimensions that make up the scientific competence in a teaching-learning context based on research.

From the interpretative analysis of the available data, it is deduced that learning related to the dimension of "Management and use of information" predominates. This means that RW contributes to the ability to review bibliographic sources and their critical and objective assessment.

According to the perception of the interviewed faculty, this informational competence is defined as the ability to "face a more academic work with the use of citations, a rigorous bibliography and that they are aware of issues of plagiarism and other elements…" (P3). In this line, some tutors highlight the importance of students looking for "experiential information…a more real and truthful, i.e. not to search for information on the Internet since there is everything on the Internet…" (P9).

According to the results obtained, something that many teachers and tutors agree on is the difficulties students face in relation to the specific competence in research. Among the most mentioned challenges, the following stand out: the search for rigorous sources; the discussion of the analyzed data, i.e. the transformation of the information into knowledge or the interpretation of the information; the drafting by means of a formal register; and the correct citation of the consulted references.

On the other hand, although less frequently, other learnings in the multiple dimensions that make up the scientific competence that high school students acquire during research work are also highlighted. Table 3 below provides a brief summary of the information provided by the interviewed teachers.

Table 3. *RW contribution to the development of specific research skills according to the tutor*

Dimension of research and learning developed	Information from data analysis
Theoretical Specific training in an area or on the topic they are researching	Q1: "First of all, a specific training of a topic of interest to them, be better done or less...". Q5: "I think it's very useful that enter the university having done more or less scientific research on a topic that they have chosen to investigate."

Dimension of research and learning developed	Information from data analysis
Research approach, planning or design Formulation of objectives and questions Development of hypotheses Discrimination of variables Study Planning Design of quantitative or qualitative methodology	Q13: "Of course they have learned research skills…to design and plan an experiment, to hypothesize, and obviously the first thing they have to do is ask questions, etc."
Development of research Experimental and laboratory work Data analysis and data representation Drawing conclusions	Q6: "…they have learned how to deal with data, which is ultimately a research competence or, if you want, treatment of scientific methods."
Linguistics Writing ability. Formal writing and academic rigor. Reading comprehension and analysis of written texts. Oral and written competence	Q2: "…the research works give them academic rigor. I think this is a very important and necessary aspect because they are used to carrying out work based on Internet sources, in a general way, randomly without any rigor." Q4: "communicative competence is fundamental, both oral and written…".

Finally, it should be noted that most teachers point out the importance of addressing and developing research competence in a deeper and earlier way, not only during high school, but also in previous courses.

> (…) research competence is a question that should be derived from ESO (…). (P14).

> (...) In my point of view, we should have started this scientific methodology from the early childhood stage and change registration when we talk about women, science or when we talk about humanistic learning. (Q8)

These statements by teachers support the legal framework of the high school curriculum, which states that research competence has a transversal character (even if it is a specific subject as is the case of the RW subject in Catalonia). However, it is considered that students should be introduced, from high school or even from ESO, in the logic of scientific research and in carrying out research work.

The information collected throughout the fieldwork reveals a duality in the perception of teachers with respect to the transversal character of the research competence. On the one hand, they indicate that it is addressed in a timely manner in some subjects of the curriculum, but, on the other hand, they consider that it is not sufficiently enhanced. This is reflected as follows:

> More work should be done... perhaps one works on time in different areas or subjects that require a specific job with a specific task, but they are small areas of work and there is no transversal continuum, as if there should be of the work of the research competence. (Q7)

> The research competence, regardless of the baccalaureate that the students do or the elective subjects that they can choose in third or fourth year, is not sufficiently developed from my point of view, among other things because there would be much more joint work, more group work … (P4)

The statements of these tutors also point to the difficulties they face in trying to address more transversely the development of research competence. Among the causes mentioned are the lack of knowledge about how to apply transversality, the rigidity of a fragmented and inflexible curriculum, and the lack of coordination among teachers, in addition to other aspects. Likewise, they stress that the framework for carrying out scientific research is not limited only to the natural or exact sciences, but can also be applied in disciplines such as the arts, humanities, sociology, politics, etc.

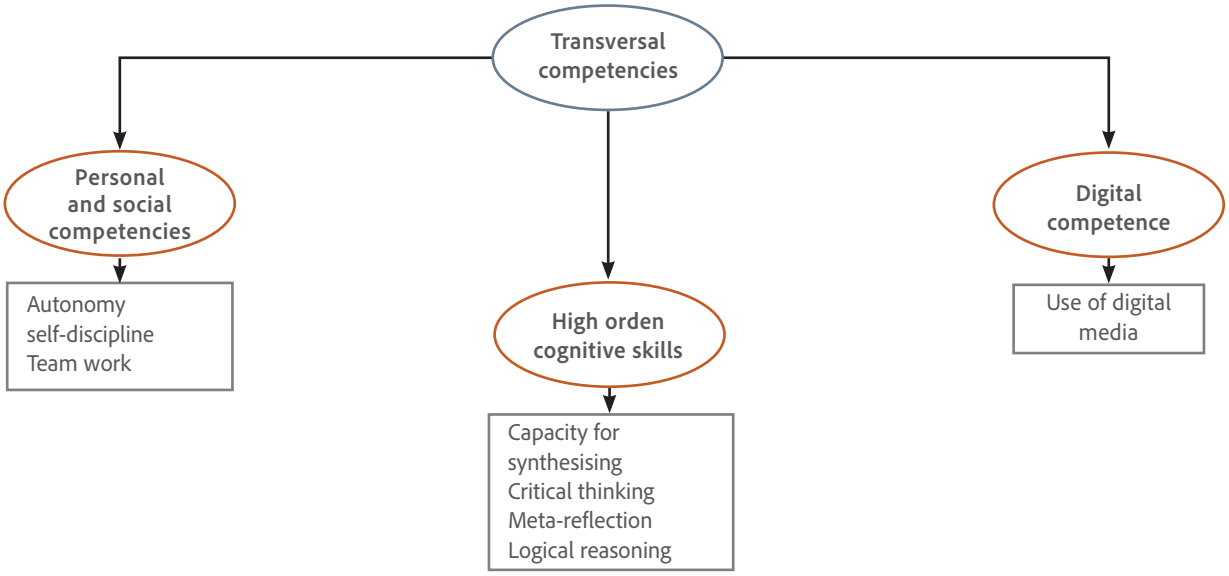
3.2.2 Cross-cutting competencies

According to the data collected, for some teachers, the research work not only provides a practical approach to the scientific method, but also a series of learning at the cognitive and personal level: "... I worry more about the personal part than the academic one, I must also say that what they learn is very

good at the cognitive level, but also at the personal level" (P1).

Thus, some transversal and useful competencies for life are also developed through the development of research competencies in high school students. Based on the interpretation of the meanings attributed by the interviewed faculty regarding this issue, Figure 1 presents, as a synthesis, the transversal or generic competencies enhanced with the development of the research work.

Figure 1. *Generic competencies that promote the conduction of RW, according to the perception of the tutor*



Teacher perception reveals a development of personal and social competencies, with a greater number of units of meaning that highlight autonomous learning and self-discipline: "They learn to carry out a work autonomously..." (P2). They also point out, although less significantly, teamwork, especially in those research projects carried out in pairs.

On the other hand, the tutor teacher mentions the development of cognitive skills, which are higher order cognitive processes widely used when researching. Some of these skills, the most mentioned, include: synthesizing, arguing, critically valuing and reflecting on learning. Regarding this last competence, the teachers affirm that the students are not fully aware of all the learning acquired until they reach the end of the research work. In this regard, they point out:

> This meta-reflection, which is a posteriori, is interesting for them to see the magnitude of the learning they have had... but at first, I think that all this is a "let's do" and they are learning, but they are not aware of it. (P10)

4. Discussion and conclusions

The research has allowed to identify the specific research competencies and the transversal competencies most developed by the high school students thanks to the conduction of the Research Work, from the perspective of both the students and their tutor teachers.

A first conclusion is the coincidence between students and teachers in the perception of the most developed competencies with RW. Both consider that the search for information is the most developed within the specific research competencies. Likewise, they also agree that autonomy, self-learning and critical thinking are the most developed within transversal or generic competencies.

Other works aimed at enhancing research competence in secondary school students have also shown improvements in the management of information and the communication of results (Franco-Mariscal, 2015). This same study also highlights the development of critical thinking in its experience

with secondary school students exposed to the conduction of research works.

As Morduchowicz (2018) indicates, "the school needs to train a student who knows how to think about the place of information in his/her life, who understands how it affects his/her perception of the world and who learns how to use it, to demand the best quality of information and to make the best decisions. In short, the student's objective is not to "copy and paste" the first link that appears in the search engine" (p.160).

Likewise, numerous authors claim the need to develop critical capacity and autonomous learning, since these competencies involve important intellectual or cognitive aspects from both the academic and citizen dimension. Promoting critical thinking in students favors their active and proactive participation in the face of the problems of their social context, becoming a tool that they can use to change their reality (Romero & Chávez, 2021). In addition, it facilitates the analysis and evaluation of everyday situations, the elaboration of judgments and reasoned arguments against situations in their near context, and the promotion of autonomous learning in line with the Sustainable Development Goals (Patiño, 2014).

Despite all this, the tutoring faculty agrees that the opportunities for students to carry out research work are scarce, since research is addressed in a timely manner in the curriculum. This could explain why other specific and cross-cutting research competencies that are also needed are not as developed. In this sense, it is appropriate to clarify that high school in Catalonia focuses on the University Entrance Tests (PAU), relegating research training to the background, beyond the specific framework of the subject of Research Work.

The competencies that the students perceive as less developed are the creative capacity, the leadership or the capacity of choosing, aspects related to personality qualities in which the simple conduction of RW does not manage to affect. However, from the LOMLOE it is claimed the need for the student to learn during the research process to identify and raise relevant problems, and the resolution capacity during the entire process of conducting the study. In addition, teachers do not perceive or consider that RW contributes to the development of personal skills, such as creative ability, leadership or adaptability.

The results suggest that RW is a good strategy to promote the development of competence and research, but on its own it does not manage to have a very important impact on the broad set of both transversal and research competencies. It is pertinent to ask whether this is due to the design of the subject or to the fact that prior secondary education does not prioritize investigative learning (Rojas et al., 2012). Probably both factors influence the observed results.

The research has allowed to deepen the contributions of the research work of high school to the development of specific and transversal research competencies. However, it presents some limitations derived on the one hand from the sample of teachers (limited to few participants) and the instrument aimed at students, of a very deductive nature. On the other hand, the results raise previously commented questions that should be answered. This encourages further research into the phenomenon, with methodological proposals that include the voice of young students and with the expansion of the sample of teaching participants, as well as the inclusion of participants who are experts in competencies and research.It may also be interesting to study the phenomenon with different methodological approaches, including pre-post designs, with the potential to establish the effectiveness of RW in the development of competencies.

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Assessment of research competence in the educational field: an analysis of measurement instruments

Evaluación de la competencia investigativa en el campo educativo: un análisis de los instrumentos de medición

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Abstract

There is a growing interest in the acquisition, promotion, and assessment of the competencies necessary for research among university students. However, within the field of educational evaluation, one confronts the complexity of establishing precise measures that inform about the performance of this competence. This study examined the measurement instruments employed to assess the research competence of university students in the educational field. The research followed the PRISMA protocol for conducting systematic literature reviews and performed a critical analysis of the identified measurement instruments. The aspects under investigation included: proposed use, target population, construct's conceptualization, instrument format, and validity evidence's generation. Findings indicated that these instruments are employed both to assess the acquisition and mastery of research competence and to evaluate the effectiveness of pedagogical interventions aimed at fostering it. A lack of representativeness of the student population in disciplines with an educational focus was identified. The components and indicators of research competence share a common organization into dimensions spanning from metacognitive skills to contextual conditions within which research is practiced. There was an observed tendency towards the use of questionnaires and a prevalence of traditional approaches in validation procedures.

Keywords: research competence, higher education, university students, student evaluation, measuring instrument, educational research.

Resumen

Existe un creciente interés en la adquisición, promoción y evaluación de las competencias necesarias para la investigación en estudiantes universitarios. Sin embargo, en el ámbito de la evaluación educativa, se enfrenta a la complejidad de establecer medidas precisas que informen sobre el desempeño de esta competencia. Este trabajo examinó los instrumentos de medición utilizados para evaluar la competencia investigativa de estudiantes universitarios en el campo educativo. El estudio siguió el protocolo PRISMA para la conducción de revisiones sistemáticas de literatura y realizó un análisis crítico de los instrumentos de medición identificados. Los aspectos bajo estudio fueron: uso propuesto, población objetivo, conceptualización del constructo, formato del instrumento y generación de evidencias de validez. Los hallazgos indicaron que los instrumentos se utilizan tanto para evaluar la adquisición y dominio de la competencia investigativa como para valorar la efectividad de intervenciones pedagógicas destinadas a fomentarla. Se identificó una falta de representatividad de la población estudiantil en disciplinas con enfoque educativo. Los componentes e indicadores de la competencia investigativa comparten una organización común en dimensiones que abarcan desde habilidades meta-cognitivas hasta condiciones contextuales donde se practica la investigación. Se observó una tendencia hacia el uso de cuestionarios y una prevalencia del enfoque tradicional en los procedimientos de validación.

Palabras clave: competencia investigativa, educación superior, estudiantes universitarios, evaluación del estudiante, instrumento de medida, investigación educativa.

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1. Introduction

The academic community has focused on the acquisition, promotion and evaluation of the necessary competencies in and for research in university students of various areas of knowledge. This trend has contributed to undertaking studies that have allowed characterizing this competence, as well as proposing methodologies for its study in higher education (Ianni et al., 2019; Paz & Estrada, 2022; Valdiviezo-Villegas et al., 2023; Sandoval-Henríquez & Sáez-Delgado, 2023). The knowledge, skills and attitudes related to scientific work are considered fundamental within the curricular and training projects of universities and institutions of higher education, especially due to its impact on the professional practice of students, the scientific advancement of the fields of study and the contribution to both economic and socio-cultural impulse at regional and national levels (Ciraso-Calí et al., 2022; Colás-Bravo & Hernández, 2021). The investigative competence is a polysemic and multifactorial construct that admits diverse approaches to determine the knowledge, skills, attitudes and values that constitute it. Colás-Bravo and Hernández (2021) point out that some components include problem solving, creativity, argumentative skills, and critical thinking. Likewise, Castillo-Martínez et al. (2021) add the domain over the designs and research approaches, as well as techniques and strategies for data collection and analysis. For their part, Ciras-Calí et al. (2022) incorporate the understanding of principles, concepts and key processes of the discipline from which it is investigated.

In a generalized way, the investigative competence refers to the set of meta-cognitive, cognitive, methodological, operative and affective-attitudinal components used autonomously and flexibly by the student to identify, solve and report on problems from a specific discipline (Espinoza et al., 2016; Estrada, 2014; Martínez-Rizo, 2019; Sandoval-Henríquez & Sáez-Delgado, 2023; Villa, 2005). The acquisition and promotion of this competence is influenced by the student's performance, the teacher's pedagogical intervention and the curricular objectives of the universities' training projects (Hernández et al., 2019). Therefore, Cardoza et al. (2023) argue that it is necessary to formulate policies, programs and strategies aimed at the evaluation of these competencies at the university. These evaluative practices are based on evaluation models distinguished by theoretical perspectives on the teaching-learning process and methodologies with implications in their applications and uses (Mellado-Moreno et al., 2021; Moreno-Olivos, 2021).

In the field of educational evaluation, one of the consolidated lines of research is that aimed at assessing and reporting on the acquisition and progress of the competences developed by the university student during his/her professional training. This is reflected in the extensive academic production around models, techniques and instruments for competency-based assessment in school contexts (Boritz & Carnaghan, 2003; Mejía, 2012; García-Cabrero & Ledesma, 2022; Manzanares & Sánchez-Santamaría, 2016). One of the persistent challenges in assessing professional competencies is to establish how to measure their performance.

The main function of measurement instruments in evaluative processes is to generate a measure that provides relevant information about the construct of interest. This information is essential to support decision-making according to the objectives and purposes of the evaluation program. In this sense, its objective is to provide scores or values of the variables of the construct under evaluation that allow accurate interpretations according to the purposes of the evaluation. Given the importance of these instruments in both summative and formative evaluations, their design and development must follow guidelines or standards recognized by the academic community to ensure their conceptual and technical quality (*e.g.* AERA, APA and NCME, 2018; Downing & Haladyna, 2011; Geisinger et al., 2013; Lane et al., 2016). Some key aspects in its development include the proposed use, target population, conceptualization of the construct, instrument format and generation of validity evidence.

The *proposed use* involves explicitly and clearly indicate how the information provided by the instrument is expected to be interpreted and used. For example, in making decisions about student admission, monitoring academic performance, improving academic performance or developing pedagogical interventions (Linn, 2010). This use or purpose of the instrument has a significant impact on the validity of inferences and conclusions (Hattie & Leeson, 2013). Another important aspect is the delimitation

of the *target population*, i.e. specifying who makes up the intended group of examinees or supporters. This provides an overview for the sampling process and is crucial for the applicability, representativeness and generalization of the results (AERA, APA and NCME, 2018).

One of the main challenges of educational evaluation lies in the *conceptualization of the construct* that is intended to measure. The theoretical and operational definitions of the construct represent a conceptual framework that points to the key components of the construct of interest, such as knowledge, skills, or behaviors. The latter are stated in the form of indicators, so that each component can be captured or recorded using an instrument. Since research competence, like other constructs in educational research, has a complex and multidimensional nature, its conceptual and operational definition must derive from systematic studies to identify and select the components that make it up (Jornet et al., 2011; Lane et al., 2016b).

This frame of reference serves as a starting point for selecting the *format of the instrument*, which varies according to the type of information or result that is expected to generate, its purpose, administration, as well as its modes of operation. These are classified into tests, questionnaires, self-report inventories, scales, observation rubrics, portfolios among others (Ary et al., 2010). Selecting which one to use depends on its relevance and suitability to capture more effectively the indicators set out in the framework.

Finally, the *generation of validity evidence* is a fundamental process to guarantee both the conceptual and technical quality of measurement instruments and evaluative processes in the educational field. Currently, this process is conducted from an argumentative approach (AERA, APA and NCME, 2018). In this perspective, validity refers not only to the numerical value obtained by a statistical index or test, but to the consistency and coherence of the evidence generated to support the inferences and uses of the results of the instrument (Kane, 1992; 2013; Ramos, 2015). This evidence derives from empirical and logical analyses of the information collected for this purpose (AERA, APA and NCME, 2018) as internal consistency indices or alignment processes. In other words, it refers to the body of evidence collected from various sources and through different analysis strategies to inform inferences and uses of the results of the instrument according to the purpose of the evaluation program.

Educational research, as an interdisciplinary field, provides various instruments to inform on the acquisition, mastery and performance of competences among university students. In addition, the specialized literature on the variables of research competence, the interventions aimed at improving it and its evaluation is extensive and timely documented. Systematic reviews of the literature (Sandelowski & Barroso, 2007; Paterson, 2012) are a systematic approach to synthesizing and integrating this body of information to provide an overview of its progress and current status.

Specifically, studies have been conducted from this approach to identify the various components that encompass research competence (*e.g.* Valderrama et al., 2022), to explore how it has been studied (*e.g.* Valdiviezo-Villegas & Leyva-Aguilar, 2023; Sandoval-Henríquez & Sáez-Delgado, 2023) or to analyze the instruments applied to report such competence in disciplines such as medicine or nursing (*e.g.* Ianni et al., 2021; Chen et al., 2021). However, in previous reviews, the recognition of the traits and conditions of research practice in the educational field has been absent. Such as the nature of the phenomena under study, currents and theoretical positions, methodologies, as well as the pedagogical purposes raised in the study programs to train professionals with orientation in this area (Martínez-Rizo, 2019; Villa, 2005). Under this perspective, the objective of this research is to examine the measurement instruments used to evaluate the research competence of university students in the educational field, focusing on fundamental aspects in its design and elaboration, such as: proposed use, target population, conceptualization of the construct, instrument format and generation of validity evidence.

2. Methodology

This research followed the guidelines established by the PRISMA protocol (Urrútia and Bonfill, 2010) for conducting systematic literature reviews, in addition a critical analysis (Sandelowski & Barroso, 2007; Paterson, 2012) of the identified academic production was carried out. This method involved a systematic approach focused on the critical and interpretative integration of literature, beyond a des-

cription of it. The databases consulted were Web of Science, Scopus and Scielo considered as the main repositories of articles related to the educational field in Anglo-Saxon and Ibero-American countries. For searching the documents, 17 terms recovered from previous literature reviews on research competence were used *(e.g.* Castillo-Martínez & Ramírez-Montoya, 2021; Valdiviezo-Villegas & Leyva-Aguilar, 2023), as well as similar exercises carried out in other areas of knowledge (*e.g.* Chen et al., 2021; Ianni et al., 2019). These terms, along with Boolean operators, were used to formulate 10 search strings (see table 1). All identified documents were exported to the Mendeley program for storage and management.

Table 1. *Search strings*

ID	Search string
CB1	("research competence" OR "academic competence") AND ("assessment" OR "measurement")
CB2	("research competence" OR "academic competence") AND "instrument"
CB3	("investigative skill" OR "investigative competence") AND ("evaluation" OR "assessment")
CB4	("investigative skill" OR "investigative competence") AND ("measurement" OR "instrument")
CB5	("research ability" OR "research capability") AND ("evaluation" OR "assessment")
CB6	("research ability" OR "research capability") AND ("measurement" OR "instrument")
CB7	("research competence" OR "research skill") AND ("evaluation" OR "assessment")
CB8	("research competence" OR "research skill") AND ("measurement" OR "instrument")
CB9	("research-based competence" OR "research-based skill") AND ("evaluation" OR "assessment")
CB10	("research-based competence" OR "research-based skill") AND ("measurement" OR "instrument")

The inclusion and exclusion criteria are set out in Table 2. Regarding the *field of study*, it was verified that the articles were related to some discipline within the field of education (*e.g.* pedagogy, educational psychology or teaching). On the other hand, for the *sample* criterion, it was found that the reported sample was composed totally or partially by university students enrolled in bachelor's, master's, specialty or doctoral programs. In relation to the thematic emphasis, it was assessed whether the components subject to measurement were directly related to the investigative competence, i.e. articles where the object of study (*e.g.* deep thinking or creativity) was not explicitly linked to the research work were excluded, even if these components are part of the competence of interest. Finally, the *construct* criterion *subject to measurement* discriminated those investigations in which the application of some instrument was not reported.

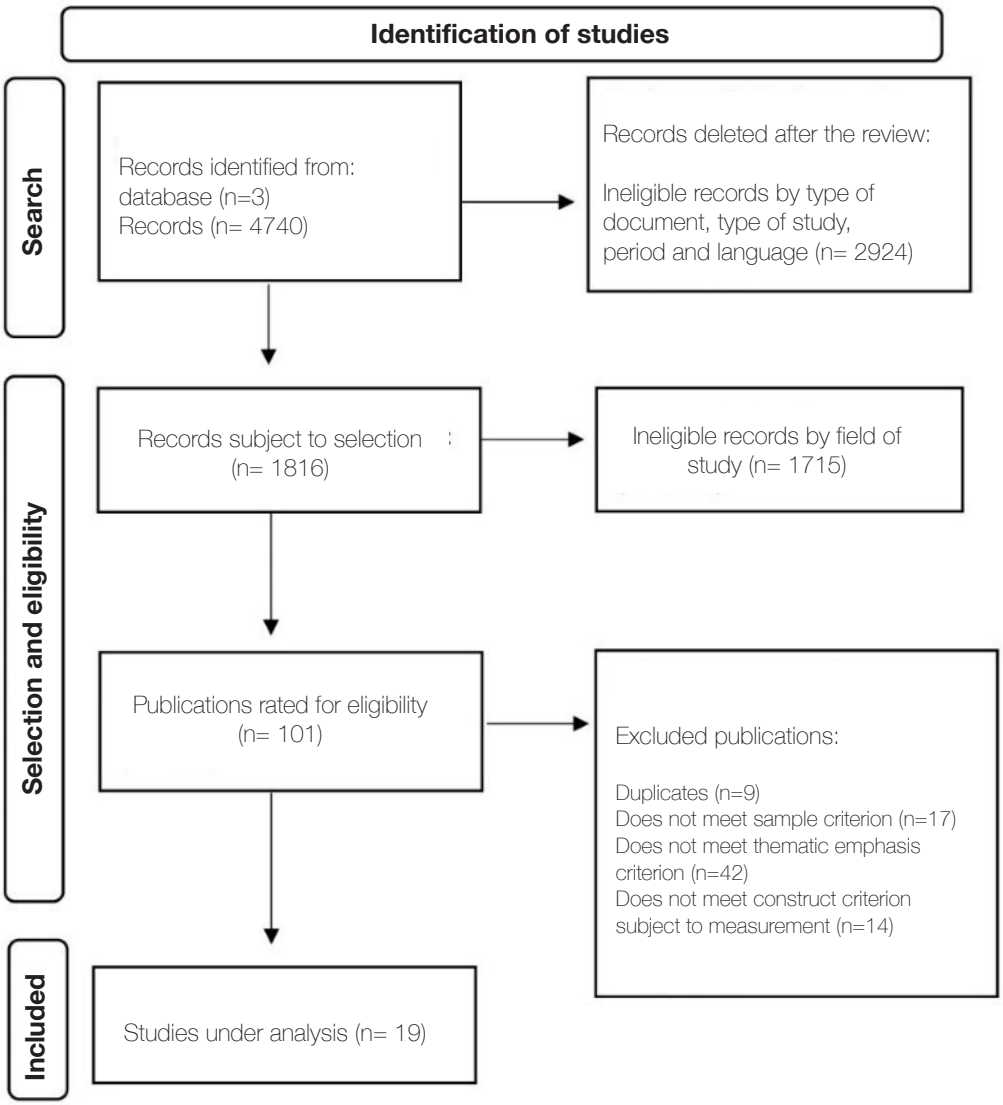
Table 2. *Inclusion and exclusion criteria*

Criterion	Inclusion	Exclusion
Document Type	Articles.	Books, book chapters, theses, conference proceedings, reports, reviews.
Type of study	Empirical.	Theoretical-analytical.
Period	2013–2023.	Prior.
Language	Spanish and English.	Another language.
Field of study	Disciplines with an explicit educational approach.	Other disciplines or without information about their educational orientation.
Sample	College students.	Students at other educational levels, teachers and researchers.

Criterion	Inclusion	Exclusion
Thematic emphasis	Components related to investigative competence.	Component isolated or without referring to the investigative competence.
Construct subject to measurement	At least one component is measured by one or more instruments.	The use of measuring instruments is not reported.

The databases yielded an initial result of 4740 documents. Once the criteria around the type of document, study, period and language were applied, it was reduced to 1816. Subsequently, titles, abstracts, keywords were reviewed and the filters available in the databases were applied to verify the criterion area of knowledge. This led to a preliminary basis of 101 studies. After the above, we read the sections corresponding to the Method to identify the *sample*, Introduction to assess the thematic emphasis and, particularly, the collection techniques used to verify the *construct* criterion *subject to measurement*. From this, a database with 19 articles was consolidated (see Figure 1).

Figure 1. *PRISMA diagram of the search and selection process*



Note. Adapted from Urrútia and Bonfill (2010).

3. Results

The results are organized according to the aspects involved in the design and development of measurement instruments such as: proposed use, target population, conceptualization of the construct, format of the instrument and generation of validity evidence.

3.1 Proposed use

The construction of measuring instruments has been driven by various reasons and purposes. Mainly, they have been developed as resources to report on the degree of acquisition and mastery of the student's knowledge, skills and attitudes in and for the field of educational research (*e.g.* Díaz-Espinoza & Cardoza-Sernaqué, 2021; Gess et al., 2019; Mendioroz et al., 2022; Muşlu-Kaygısız et al., 2018; Reyes-González & García-Cartagena, 2014; Ríos et al., 2023). On the other hand, they have also been built to collect information for evaluations of the effectiveness or incidence of educational programs or strategies aimed at promoting research competence (*e.g.* Carlín-Chávez et al., 2020; Marrs et al., 2022; Su & Long, 2021; Wongdee, 2019). To a lesser extent, these have been used in diagnostic evaluations that have ultimately served as a starting point for developing intervention models or programs (*e.g.* Gómez-Escorcha et al., 2019; Olazábal & Aguila, 2020; Sanabria et al., 2014). The intended purpose of an instrument has an impact on the potential inferences and conclusions that can be drawn from its scores. The clear description of its purposes allows an adequate interpretation of the information obtained, otherwise, there is a risk of distorting these interpretations and arriving at conclusions that the scores or results cannot support (Kane, 1992; 2013). In this sense, clarity and explicit use are indicators of quality of an instrument.

3.2 Target population

Educational research is a field of knowledge and interdisciplinary professional practice enriched by different perspectives on educational phenomena. The findings indicate that the samples are composed of students enrolled in a variety of study programs, differentiated by their curricular and training objectives. On the one hand, there are those who study programs aimed at training professionals in a specific discipline, such as: Pedagogy (*e. g.* Rodríguez et al., 2023), Child Pedagogy (*e. g.* García-Gutiérrez & Aznar-Díaz, 2019), Educational Psychology (*e. g.* Díaz-Espinoza & Cardoza-Sernaqué, 2021; Marrs et al., 2022) or Educational Communication (*e. g.* Juárez and Torres, 2022).

On the other hand, a significant part of the target populations is made up of students who are training as professionals of education, i.e. teaching in a discipline or special school contents, mainly related to primary education (*e.g.* Mendioroz et al., 2022; Núñez-Rojas et al., 2021), mathematics for basic education (*e.g.* Reyes-González & García-Cartagena, 2014; Sanabria et al., 2014) and early childhood education (*e.g.* Mendioroz et al., 2022; Muşlu-Kaygısız et al., 2018). This diversity reflects an interest in obtaining information on the acquisition and development of research competence in students in the educational field. This, in turn, emphasizes the importance of recognizing the traits of both the profession and the training programs according to their purposes, disciplinary conventions, sociocultural context and institutional conditions (Hernández et al., 2019; Martínez-Rizo, 2019) that intervene in the practice of educational research. Table 3 summarizes the findings in relation to the proposed uses and target population expressed by the reported samples.

Table 3. *Proposed uses and target population of the measurement instruments analyzed*

Main Reference	Proposed use	Sample
Carlín-Chávez et al. (2020)	Report on the effectiveness of a didactic strategy focused on research projects for research skills.	n=25 Program: physical education.
Díaz-Espinoza & Cardoza-Sernaqué (2021)	Estimate research capabilities and attitude towards educational research.	n=269 Programs: education administration, education and educational psychology.

Main Reference	Proposed use	Sample
Fuster-Guillén & Santa-María (2020)	Correlate variables of deep thinking, as a component of research competence, with the ability to solve social problems.	n=141 Program: education.
García-Gutiérrez & Aznar-Díaz (2019)	Report on the acquisition and development of research competence.	n=244 Program: children's education.
Gess et al. (2019)	Generate a measure for the evaluation of research competence.	n=138* Program: education.
Gómez-Escorcha et al. (2019)	Diagnose the mastery degree over the knowledge required to formulate a research project.	n=25 Program: educational planning.
Juarez & Torres (2022)	Report on the impact of the training project as a didactic intervention for the development of research competence.	n=58 Programs: educational communication, pedagogy and art education.
Marrs et al. (2022)	Offer a measurement of research competence to assess the quality of training or intervention programs.	n=456 Programs: education, educational psychology and special education.
Mendioroz et al. (2022)	Indicate the student's perceived assessment of their own performance with respect to the research competence.	n=208 Programs: early childhood and primary education.
Muşlu-Kaygısız et al. (2018)	Determine the degree to which students can evaluate and make a judgment on the quality of scientific evidence or literature.	n=947 Programs: science and mathematics teaching in basic education, early childhood education, primary education.
Núñez-Rojas et al. (2021)	Expose the students' perceptions on the promotion of research competence through didactic strategies such as training projects and action research.	n=84 Programs: early childhood, primary and secondary education.
Olazábal & Aguila (2020)	Diagnose the degree of dominance over research competence.	n=33 Program: Teaching foreign language English.
Ravelo-Peña et al. (2019)	Provide a measure to identify the current state of the theoretical-methodological domain that students possess about the process to conduct research.	n=46 Program: education with specialty in pedagogy-psychology.
Reyes-González & García-Cartagena (2014)	Provide a measure of students' abilities to conduct research.	n=19 Programs: teaching in physics, chemistry and mathematics.
Ríos et al. (2023)	Provide a measure of the mastery degree of research competence in students.	n=304 Programs: education.
Rodríguez et al. (2023)	Inform about knowledge, recognition and attitudes towards educational research.	n=952 Program: primary education, early childhood education and pedagogy.
Sanabria et al. (2014)	Offer a measure as an input for the elaboration of a pedagogical intervention model for the promotion of research competence.	n=6 Programs: teaching in social sciences, biology and mathematics.
Su & Long (2021)	Report on the incidence of two didactic strategies, the conceptual map and an online visual resource based on the text, for improvement in the construction and evaluation of arguments.	n=72 Program: teaching for music, physics and literature.
Wongdee (2019)	Indicate the development of research competences from a pedagogical intervention that implements an activity-based learning model.	n=79 Program: industrial education.

* Represents a partial amount of the total sample reported.

3.3 Conceptualization of the construct

There are different approaches in the conceptualization of investigative competence due to its complex nature. This plurality is seen in the components of the competition, where the same aspect can be defined in different ways. Therefore, in this study it was chosen to adhere, as possible, to the definitions and organizing principles established by the authors of the studies analyzed (see table 4). Despite this decision, the analysis revealed patterns that allowed identifying components in which different conceptions of research competence converge. The following stand out:

- *Meta-cognitive and cognitive skills*: include problem analysis, interpretation of findings, understanding of concepts and disciplinary principles, critical, reflective and argumentative thinking (*e.g.* Fuster-Guillén & Santa-María, 2020; Marrs et al., 2022; Mendioroz et al., 2022; Muşlu-Kaygısız et al., 2018; Su & Long, 2021).
- *Methodological knowledge*: refers to the domain of the stages and processes involved in the research process and the methodology in the research (*e.g.* García-Gutiérrez & Aznar-Díaz, 2019; Gess et al., 2019; Gómez-Escorcha et al., 2019; Núñez-Rojas et al., 2021; Olazábal & Aguila, 2020; Ravelo-Peña et al., 2019; Wongdee, 2019).
- *Verbal, written and digital communication*: it involves the ability to share, publish and disseminate the knowledge obtained by research in different formats such as articles, theses or papers (*e.g.* Gómez-Escorcha et al., 2019; Juárez & Torres, 2022; Reyes-González & García-Cartagena, 2014; Ríos et al., 2023; Sanabria et al., 2014).

In addition, other components related to:

- *Feasibility or operability of the research project*: the student's ability to plan and effectively execute a project outside available resource (Carlín-Chávez et al., 2020; Gess et al., 2019).
- *Effective and attitudinal components*: related to the willingness, duties, perceptions and motivations of the student towards research (Díaz-Espinoza & Cardoza-Sernaqué, 2021; Rodríguez et al., 2023).
- *Contextual conditions*: the recognition of the characteristics of the environment and institutional conditions as a fundamental aspect in the elaboration and execution of research projects (García-Gutiérrez & Aznar-Díaz, 2019).

A distinctive component was also observed for students in programs for the training of teaching professionals, which refers to the *application in educational practice* of the results and advances generated through educational research (Gómez-Escorcha et al., 2019; García-Gutiérrez & Aznar-Díaz, 2019; Olazábal & Aguila, 2020). It is important to note that the definitions of the components of research competence, reported in the literature, are usually descriptive and ambiguous. This makes it difficult to identify the relationship between conceptual definition and operational statements, which serve as indicators to be scored or captured by instruments.

Table 4. *Components subject to measurement of investigative competence*

Main Reference	Components
Carlín-Chávez et al. (2020)	Methodology of scientific research, scientific-technological impact, potential results of the proposal, applicability and exposure.
Díaz-Espinoza and Cardoza-Sernaqué (2021)	Cognitive and technological skills, information search, elaboration of theoretical and methodological framework, report of results, bibliographic references, research experience, cognitive, affective and behavioral attitude.
Fuster-Guillén and Santa-María (2020)	Cognitive, communicative, investigative, operational, problem-solving and attitude skills.
García-Gutiérrez and Aznar-Díaz (2019)	Field analysis using observational methodology and information technologies, analysis of the data obtained, understanding of the reality, reporting, linking educational practice and theory, promotion of educational research and innovation, personal and professional development, reading of specialized literature.

Main Reference	Components
Gess et al. (2019)	Mastery of the research process, reflection of one's own practice, methodical and methodological knowledge.
Gómez-Escorcha et al. (2019)	Basic competencies (*e.g.* integrated application of knowledge, skills and abilities to diagnose and interpret reality, know theories and epistemic models), methodological and professional competencies (knowledge and skills for teaching practice).
Juarez and Torres (2022)	Formulation of research problems, raising questions to carry out information searches, selection and evaluation of the relevance and quality of resources, critical analysis of data, socialization of findings; communication skills.
Marrs et al. (2022)	Skills for state-of-the-art development, methodological skills, reflection on findings, communicative skills and content knowledge.
Mendioroz et al. (2022)	Comprehensive (*e.g.* information interpretation), critical (*e.g.* information evaluation), creative (*e.g.* relationship building) and meta-cognitive (*e.g.* decision making) competencies.
Muşlu-Kaygısız et al. (2018)	Scientific thinking.
Núñez-Rojas et al. (2021)	Planning, action, observation, reflection and organization.
Olazábal and Aguila (2020)	Design of pedagogical research, analysis of information based on methodologies in the field of pedagogy, implementation of tasks for solving pedagogical problems, communication of the results.
Ravelo-Peña et al. (2019)	Cognitive dimension (*e.g.* mastery of research content), research activities (*e.g.* reflection and collaborative work) and management of the pedagogical collective from the discipline (*e.g.* planning of research activities).
Reyes-González and García-Cartagena (2014)	Observation skills, processes and scientific communication.
Ríos et al. (2023)	Formulation of the problem approach, theoretical-conceptual framework and state-of-the-art, methodology, communication of the results and evaluation.
Rodríguez et al. (2023)	Willingness and participation in the research, self-assessment, teaching intervention and institutional conditions.
Sanabria et al. (2014)	Technological, meta-cognitive (*e.g.* reflection and learning strategies) and investigative competence.
Su and Long (2021)	Skills for evaluating and constructing arguments.
Wongdee (2019)	Clarity and consistency of the relationship between variables and context, consistent and argued problem approach, objectives consistent with hypotheses and operational definitions of the variables, elaboration of the state-of-the-art or literature review, knowledge about methodology, results consistent with objectives and elaboration of projects in accordance with academic regulations.

3.4 Format of the instrument

The selection of a format for the instrument depends on how the construct has been defined in operational terms, which in turn determines the type of information collected. In other words, decisions about what type of instrument to design and apply condition the scope and way in which the construct subject to measurement is captured. The results show an inclination towards the use of questionnaires to report on the research competence of students (*e.g.* Fuster & Santa-María, 2020; García-Gutiérrez & Aznar-Díaz, 2019; Gómez-Escorcha et al., 2019; Marrs et al., 2022; Mendioroz et al., 2022; Muşlu-Kaygısız et al., 2018; Núñez-Rojas et al., 2021; Reyes-González & García-Cartagena, 201; Ríos et al., 2023; Rodríguez et al., 2023). However, formats such as the observation rubric (Juárez & Torres, 2022), surveys (Olazábal & Aguila, 2020; Ravelo-Peña et al., 2019), knowledge tests and attitudinal scales (*e.g.* Wongdee, 2019) have also been used. In addition, instruments with different administration methods have been used such as the self-assessment scales (Díaz-Espinoza & Cardoza-Sernaqué, 2021; Gess et

al., 2019). Also, formats that operate through the analysis of materials such as protocols to evaluate research projects (Carlín-Chávez et al., 2020) and verbal reports (Sanabria et al., 2014) have been used.

The predominance of the questionnaire follows a tradition in educational measurement that considers numerical scores as main indicators of acquisition, and dominance and performance related to a competition (Ary et al., 2010; Linn, 2010). Against this background, it is important to promote the use of multiple tools to obtain information on components of research competence that could be inaccessible through questionnaires. Examples of this are found in the studies published by Fuster & Santa-María (2020) and Reyes-González & García-Cartagena (2014).

3.5 Generation of evidence of validity

Validity evidence is essential to support the possible interpretations derived from the scores obtained through the measurement instruments. In the studies analyzed, it is common to generate the evidence through empirical analyzes (AERA, APA and NCME, 2018), i.e. through statistical tests. For example, the Cronbach alpha index is commonly reported with values ranging from 0.780 to 0.967 (Díaz-Espinoza & Cardoza-Sernaqué, 2021; Fuster & Santa-María, 2020; García-Gutiérrez & Aznar-Díaz, 2019; Marrs et al., 2022; Mendioroz et al., 2022; Núñez-Rojas et al., 2021; Ríos et al., 2023; Rodríguez et al., 2023); and Kairse-Meyer-Olkin test (KMO), used mainly to verify the adequacy of items to the construct subject to measure or to estimate the relevance of conducting factor analysis, is reported with values in a range of 0.701 to 0.973 (Muşlu et al., 2018; Núñez-Rojas et al., 2021; Ríos et al., 2023). In some studies, agreement indices between experts or judges are used to provide evidence of content validity with values between 0.80 and 0.950 (Su & Long, 2021; Wongdee, 2019).

It is important to note that in some cases no evidence of validity is reported (Carlín-Chávez et al., 2020; Gómez-Escorcha et al., 2019; Juárez & Torres, 2022; Olazábal & Aguila, 2020; Ravelo-Peña et al., 2019; Reyes-González & García-Cartagena, 2014; Sanabria et al., 2014) which underlines the importance of properly documenting the psychometric properties of the instruments used.

Analysis of this aspect suggests a traditional approach to validation focused on obtaining numerical values through indices, coefficients and other statistical tests as the only argument that the scores obtained allow to make informed inferences. However, a distinctive case is the work of Gess et al. (2019) where a validation process is conducted from an argumentative approach. In this case, the authors make assumptions such as: 1) the scale reflects the research competence in the social sciences, distinguishing it from the natural sciences, 2) the scores account for the student's performance, or 3) the scale is applicable to students of various disciplines within the social sciences (*e.g.* educational sciences or sociology). From this, they perform empirical and logical analyses to generate evidence of validity that supports these assumptions and, therefore, the use of the results of the instrument.

4. Discussion and conclusions

Research from the Educational Evaluation has highlighted the inherent complexity of determining how to obtain measures or values that accurately reflect the acquisition and performance of the competences acquired by university students. Therefore, the development of measurement tools requires both careful planning and systematic procedures if the results are to be used effectively in decision-making. The objective of the study was to examine the instruments used to inform research competence in the educational field of university students. The analysis focused on the main aspects involved in its design and development, such as: proposed use, target population, conceptualization of the construct, format of the instrument and generation of validity evidence.

During the last decade (2013-2023), the development of tools has focused mainly on the following objectives: 1) reporting on the degree to which students have acquired and developed the various components that make up research competence; 2) providing information based on which to assess the effectiveness of pedagogical interventions aimed at promoting such competence; and 3) providing data for diagnostic evaluations. The intended use of a measurement instrument is not limited to simply stating its purposes and purposes, it's clear and explicit definition delimits the inferences, conclusions and decisions that its results can support, linking

directly with the generation of validity evidence (Hattie & Leeson, 2013; Kane, 1992; 2013).

Given the traits of educational research in terms of its theoretical perspectives, methodological resources and academic conventions, the evaluation of research competence in this area requires instruments sensitive to these distinctions. During the selection process in the systematic review, a significant reduction of articles that met the *field of study* criterion was observed, aimed at identifying those investigations that explicitly referred to disciplines with an educational approach. The latter agrees with the findings presented by Sandoval-Henríquez & Sáez-Delgado (2023), where it is highlighted that academic production on the topic of interest concentrates in the health (*e.g.* medicine and nursing) and natural sciences (*e.g.* physics, biology and chemistry).

On the other hand, it is important to distinguish between the training of professionals in a discipline with an educational focus (*e.g.* educational psychology or pedagogy) and the training of professionals for initial teacher education or training. While each one is framed in training projects with curricular objectives and demands both professional and different social (Martínez-Rizo, 2019; Villa, 2005). In this sense, the selection of the students that make up the target population must be carried out carefully to develop instruments sensitive to these distinctions and provide coherent information on the achievement of research competence.

As this competence is a complex and multifactorial construct, its definition represents a challenge for Educational Evaluation. Despite this, the findings highlight a certain structural uniformity in the conceptualization of the construct, i.e., of the investigative competence in and for the educational field. The components and indicators follow a common organization according to meta-cognitive, cognitive, methodological dimensions, as well as aspects related to communication, viability and operability, affective-attitudinal attributes and contextual conditions where research is practiced. These dimensions or categories are in line with those established in the specialized literature (Ciras-Calí et al., 2022; Colás-Bravo and Hernández, 2021; Espinoza et al., 2016; Martínez-Rizo, 2019; Sandoval-Henríquez & Sáez-Delgado, 2023).

On the other hand, it is important to note that in most of the studies analyzed the definitions are usually presented from a descriptive level and often the operational definitions of each component subject to measurement are absent. This lack of clarity limits the discussion about the meaning given to research competence and how to measure its different components, as well as it hinders collaborative, cumulative and consistent work among the academic community.

The diversity of definitions of research competence leads to a variety of possible formats for measurement instruments. Although the questionnaire is the commonly used format, others were also identified as the rubric of observation, tests, attitudinal and self-assessment scales, evaluation protocols of thesis projects or verbal reports. In the selection of one or the other format, its scope and limitations should be considered when reporting on a specific component of the investigative competence. Thus, it is necessary to assess the relevance of the format according to the proposed uses and the type of information that each one offers (Ary et al., 2010; AERA, APA & NCME, 2018; Naglieri, 2013). In addition, the use of multiple formats can be promoted to capture more fully a complex competence such as research (Fuster & Santa-María, 2020; Reyes-González & García-Cartagena, 2014).

Finally, the procedures to generate evidence of validity have been carried out from a traditional approach. The notion of validity in the analyzed studies refers mainly to a property of the instrument that is verified by obtaining a numerical value through statistical tools. These values are considered as the only argument to support the results of the instrument. However, the study conducted by Gess et al. (2019) who carried out the validation from an argumentative approach stands out.

Therefore, it is suggested to generate evidence of validity from the argumentative approach. This involves using various sources of information and analysis strategies to obtain consistent and coherent evidence that bases both the components of research competence subject to measurement and the possible uses and interpretations of the results obtained by the instrument (AERA, APA & NCME, 2018; Kane, 2013; Ramos, 2015).

This study highlights the need for deeper analysis on both conceptual and operational definitions of research competence, as well as its distinctive features in the training of professionals in disciplines

with educational orientation and in the training for teaching professionals. It also underlines the importance of reviewing procedures to obtain more comprehensive evidence of validity.

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Educational frontiers with ChatGPT: a social network analysis of influential tweets

Fronteras educativas con ChatGPT: un análisis de redes sociales de tuits influyentes

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Abstract

The unprecedented adoption of OpenAI's ChatGPT, marked by reaching 100 million daily users in early 2023, highlights the growing interest in AI for educational improvement. This research aims to analyze the initial public reception and educational impacts of ChatGPT, using social network analysis of the 100 most influential tweets. Using the ForceAtlas2 algorithm and thematic content analysis, the study explores the appeal of ChatGPT and its prospects as an educational tool. The findings underscore ChatGPT's potential to revolutionize teaching methods, facilitate personalized learning, and bridge gaps in access to quality education. In addition, the analysis sheds light on ChatGPT's role in promoting critical thinking and interactive learning, its utility in creating educational content, and its ability to enhance teacher-student interactions. These findings point to a shift toward AI-enhanced education and argue for the integration of ChatGPT and similar technologies into learning environments. The discussion argues for empirical research on the educational impact of ChatGPT and urges a cautious approach to its adoption. It highlights the need for frameworks that harness the power of ChatGPT while addressing ethical and practical challenges. Finally, this study describes the initial reception of ChatGPT and highlights its transformative potential in education. It calls for strategic AI integration to optimize educational processes, and emphasizes the importance of continued research to navigate the evolving role of AI in learning.

Keywords: AI, ChatGPT, OpenAI, SNA, tweets, education.

Resumen

El uso sin precedentes de ChatGPT de OpenAI que alcanzó 100 millones de usuarios diarios a principios de 2023 es una muestra del creciente interés en la IA para la mejora educativa. Esta investigación pretende analizar la recepción pública inicial y las implicaciones educativas de ChatGPT, utilizando el análisis de redes sociales de los 100 tuits más influyentes. Mediante el algoritmo ForceAtlas2 y el análisis de contenido temático, el estudio explora el atractivo de ChatGPT y sus perspectivas como herramienta educativa. Los resultados subrayan el potencial de ChatGPT para revolucionar los métodos de enseñanza, facilitar el aprendizaje personalizado y reducir las brechas en el acceso a una educación de calidad. Además, el análisis informa sobre el papel de ChatGPT en la promoción del pensamiento crítico y el aprendizaje interactivo, su utilidad en la creación de contenidos educativos y su capacidad para mejorar las interacciones entre profesores y alumnos. Estas conclusiones apuntan a un cambio hacia una educación mejorada por la IA y abogan por la integración de ChatGPT y tecnologías similares en los entornos de aprendizaje. El debate aboga por la investigación empírica sobre el impacto educativo de ChatGPT e insta a adoptar un enfoque cauteloso en su adopción. Destaca la necesidad de marcos que aprovechen el poder de ChatGPT al tiempo que abordan los retos éticos y prácticos. Por último, este estudio describe la acogida inicial de ChatGPT y destaca su potencial transformador en la educación. Hace un llamamiento a la integración estratégica de la IA para optimizar los procesos educativos y subraya la importancia de seguir investigando para navegar por el papel evolutivo de la IA en el aprendizaje.

Palabras clave: IA, ChatGPT, OpenAI, SNA, tuits, educación.

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1. Introduction

The development of artificial intelligence applications and the wide range of applications of the products they produce in many fields is one of the most important reasons why the new developments in this field are eagerly followed by users. Following the launch of the GPT-3 natural language processing model, which caused a great sensation with its features in 2020, OpenAI company launched the ChatGPT chat bot in November 2022. The results obtained from the use of ChatGPT have led to the beginning of a revolutionary period in artificial intelligence. Developed using the GPT-3.5 language model, an improved version of GPT-3, ChatGPT is the result of OpenAI's ongoing work on increasingly secure and useful artificial intelligence systems (OpenAI, 2023). The ability of ChatGPT to perceive texts written by humans to a good extent and to generate text that is indistinguishable from a text created by a human using its natural language processing ability has contributed to its popularity. In March 2023, the GPT 4 is available as final version. GPT 4 also accepts visual inputs.

After its launch, ChatGPT attracted more than one millions of users within just one-week, surpassing adoption rates of other popular online platforms such as Netflix, Facebook, and Instagram (Sier, 2022). In particular, discussions surrounding the current state of artificial intelligence technology were sparked for days as individuals shared on social media the texts generated on ChatGPT. The responses provided by ChatGPT to users' texts were shared on social media and used to discuss the evolution of artificial intelligence from the past to the present, as well as possible future scenarios. As one possible scenario for the future, Grant and Metz (2022) suggest that large language models (LLMs) like ChatGPT could serve as inspiration for the next generation of search engines capable of generating detailed and informative answers to complex user questions.

The fact that ChatGPT shows non-existent sources and provides incomplete and inaccurate information has been one of the most debated topics. For example, van Dis et al. (2023) cited the case where ChatGPT provided a general and non-research-based answer to the question asked by depression patients about the recurrence rate of their illness after treatment. One of the main factors leading to this situation is the lack of content taught to ChatGPT that covers the question asked. Texts containing such misinformation resulting from the use of ChatGPT can provide false references for newly created texts. Neutrality and ethical values are among the most important qualities in texts based on research. One of the most important problems of significant LLMs such as ChatGPT from the perspective of researchers is that they do not have a transparent structure accessible to everyone (van Dis et al., 2023). This situation is contrary to the movement towards transparency and open science, as it prevents technology companies from hiding the internal workings of chat-based artificial intelligence and can make it difficult to reveal the source or gaps in information of chatbots (Rudin, 2019).

In educational settings, ChatGPT can assist in a number of ways, including designing assessments, producing essays, and translating languages. It can also be used to pose and answer a variety of questions, summarize texts, and interact with it in a manner similar to that of peers (Sok, 2023). As there are a number of innovative features offered by ChatGPT, it is an advantage for teachers to improve pedagogical practices by designing and integrating interactive classroom activities (Sok & Heng, 2023). The chat format of the platform also renders it interactive and accessible to individuals with varying degrees of technical expertise (Adeshola & Adepoju, 2023). The integration of AI-powered chatbots, such as ChatGPT, has the potential to revolutionize education by providing personalized and interactive learning experiences (Woodland, 2023). These chatbots, such as Google's Bard and OpenAI's ChatGPT, can provide dynamic conversations, instant feedback, and personalized learning materials that cater to individual needs and learning styles (Firat, 2023a). They increase learner engagement and motivation, enable continuous learning beyond the traditional classroom, and empower students to explore different subjects and expand their knowledge (Grassini, 2023). In addition, these AI technologies serve as valuable tools for educators, automating administrative tasks, generating instructional materials, and providing personalized feedback to students (Adıgüzel, et al., 2023). By harnessing the power of AI chatbots, educators can individualize their teaching approach, adapt to diverse student needs, and create more engaging learning environments

(Lozano & Blanco Fontao, 2023). However, concerns have been raised about the potential reduction in analytical skills and the need for critical evaluation of the chatbot's output (Currie & Barry, 2023). Overall, the integration of AI-powered chatbots has the potential to transform education by enhancing the learning experience and optimizing instruction.

Social media platforms have become indispensable communication networks where local or global prominent events are discussed and followed to determine the agenda. As a type of digital communication, various digital activism phenomena have emerged on social media using hashtags (#), and social media users have started a kind of digital social movement by showing their attitude towards whether or not to participate in the issue that stands out in a specific event, such as on X (previously Twitter) with the use of hashtags (#) (Yogatama et al., 2022).

1.1 Social Network Analysis and X (previously Twitter)

Social networks are one of the most important communication tools in today's digital world (Valencia-Ortiz, et al., 2023). Social media tools, which enable millions of people around the world to communicate with each other through shared visual and textual content, are among the most important data production platforms. Various techniques have been developed to analyze opinions about a product, predict election results, and examine how fake news spreads through social networks (Camacho et al., 2021). One of the most prominent techniques is social network analysis, which is used to map and measure formal or informal relationships, focusing on the structure of social relationships and the flow of information that connects interacting units. It aims to understand what facilitates or hinders the flow of information, who knows whom, the type of information and the communication channels (Serrat, 2017). Social network analysis method fits this research, which aims to identify the initial public reception and educational impacts of ChatGPT.

When examining the literature, many studies focus on X, one of the most important microblogging sites (Battisti et al., 2022). Microblogs allow users to share small content pieces such as short sentences, instant photos, or video links, enabling rapid and intensive content sharing among users (Kaplan & Haenlein, 2011). The user capacity of X, as well as the structure and volume of the generated content, are the main reasons why it is frequently used by researchers who want to conduct social network analysis. ChatGPT is a highly effective tool for natural language processing (NLP) tasks. Its capabilities are being increasingly recognized by programmers and researchers, who are exploring its potential for creative applications in their work (Barari & Kumar, 2023). Therefore, in this study, we used the X platform to determine the first impressions, impact, and potential implications for education of ChatGPT, an innovative and rapidly expanding AI technology.

Various studies can be found in many different areas regarding social network analysis conducted with X data such as predicting election results (Grover et al., 2019), sentiment analysis (Alharbi & de Doncker, 2019), the finance sector (Battisti et al., 2022), tourism (Lu & Zheng, 2021), and education (Carpenter et al., 2020) to identify changes in these fields. When examining the characteristics of the X network, Kwak et al. (2010) found that most users use X to discuss their daily activities or their opinions on current issues. Compared to other social media tools, X is closely related to hashtag movements, social movements, and various forms of social campaigns (Li et al., 2021).

1.2 Related Studies

In line with the rapid popularization of ChatGPT, the academic literature on artificial intelligence tool is also expanding rapidly. The reasons for the high interest in ChatGPT have been attracting the attention of researchers since its public launch. As ChatGPT is still a new tool, academic publications on the tool have been limited. Most of these publications are in preprint type. The foci of the publications can be classified into the two themes as ChatGPT's benefits and ChatGPT's usage areas.

In the related literature there are some studies emphasizing the benefits of ChatGPT. For Cotton et al. (2023), one of the main advantages of ChatGPT's AI model is providing a platform for asynchronous communication. This feature can be used as an essential solution to prevent learners from feeling isolated in open and distance learning. Moreover, this feature enables students to send questions and

discuss topics without the need for simultaneous presence, resulting in increased student participation and collaboration (Li & Xing, 2021). Another advantage of ChatGPT is that it can facilitate collaboration among students. For example, ChatGPT that allow students to work together on projects and assignments can be used to create student groups (Lewis, 2022). Additionally, ChatGPT can be used to enable remote learning for learners who cannot attend classes for various reasons. ChatGPT also has the potential to be used for various purposes in education, such as support services, material production, measurement, and evaluation (Firat, 2023a).

The second theme that the literature focuses on is ChatGPT's areas of use, which is more relevant to this research. Haque et al. (2022) conducted a social network analysis using 10,732 X data to determine the topics surrounding ChatGPT and found that the contents can be classified under nine main headings. Through their research on X data and early adopters of ChatGPT, they identified several topics, including Q&A testing, chatbot intelligence, implications for search engines, future career and opportunities, impact on business development, implications for search engines, and impact on educational aspects. Similarly, Taecharungroj (2023) conducted a study on tweets related to ChatGPT from November 30 to December 31, 2022, and found that news, technology, reaction, creative writing, essay writing, prompt writing, code writing, answering questions, impacting tech, and impacting humans were the predominant topics.

A review of the related literature shows that there is a focus on predictions based on individual experiences and potential uses according to the capabilities of the tool rather than data-based insights. There are also studies (Haque et al., 2022; Taecharungroj, 2023) that have analyzed social network posts related to ChatGPT. However, these studies are limited to topic analysis, descriptive classification and content analysis. For this reason, it is considered that there is a need for social network analysis research using valid and reliable layout Algorithms such as ForceAtlas. Thus, not only the topics will be reached, but the network structure between these topics will also be identified.

1.3 Research Purpose

The goal of this research is to explore the initial user perceptions and the underlying factors that led to the remarkable emergence of interest in ChatGPT. This will be accomplished through a social network analysis of the 100 most influential tweets about ChatGPT, collected from January 26 to February 1, 2023. By examining these interactions, this study aims to uncover users' reactions, expectations, and views on artificial intelligence. Such insights are expected to shed light on the various applications and implications of ChatGPT in different domains.

2. Methodology

The research employed social network analysis as a method, and data collection and analysis processes were conducted through the SocioViz platform. The data were collected two months after the emergence of ChatGPT because more realistic opinions about a new technology can mature only after a while. The 100 most popular tweets containing the keyword "ChatGPT" posted between January 26 and February 1, 2023, were subjected to social network analysis. The network map of the most influential users is provided in Figure 1.

Figure 1. *Network of most influential users*

As seen in Figure 1, there is no complex network structure among the users who posted popular ChatGPT tweets, and only two clusters are observed. The magenta-colored cluster is centered around the user @shifortech, who was found to mention other users in his tweet, highlighting the potential danger of ChatGPT. In the red, orange, and green-colored cluster, it was determined that three users retweeted a tweet containing the content "8 AI tools to save you 100s of hours of manual work" that mentions nine users.

The forceAtlas2 Layout Algorithm was used in the social network analysis of X posts. ForceAtlas2 is a continuous graph force-directed layout algorithm for network visualization (Jacomy et al., 2014). In ForceAtlas2, nodes repel each other like charged particles, while edges pull the nodes, they are connected to like springs. These forces create a movement towards a balanced state in a network structure. Therefore, the position of a node depends on its relationship with other nodes. Consequently, the position of a node cannot be interpreted in isolation; instead, the coherence of node groups is interpreted. This structure facilitates social network analysis.

Nodes that form a close community in the social network can be evaluated and thematized together. Noack (2009) demonstrated that the proximity between nodes represents communities, while Newman (2004) revealed that actors in a network have more relationships within the community than outside it. The essence of the algorithm is to convert structural closeness into visual closeness, making the analysis of social networks easier. Two important settings used in the adjustment of the forceAtlas2 Layout Algorithm are given below.

- *Gravity*: This setting prevents components (islands) that are disconnected from each other from moving away from each other. It positions the nodes in the center of the network. Its main purpose is to compensate for the repulsion of nodes moving away from the center and to keep the network together.
- *Scaling* (Constant): This setting adjusts the gravitational and repulsive forces. It is used to reduce or increase the size of the graph.

In this study, the default values of gravitational force (-2000), central gravity (0.3), and spring constant (0.04) were used in the social network analysis. Finally, the Prevent Overlapping setting was enabled to reduce overlapping and enhance readability and aesthetic appearance.

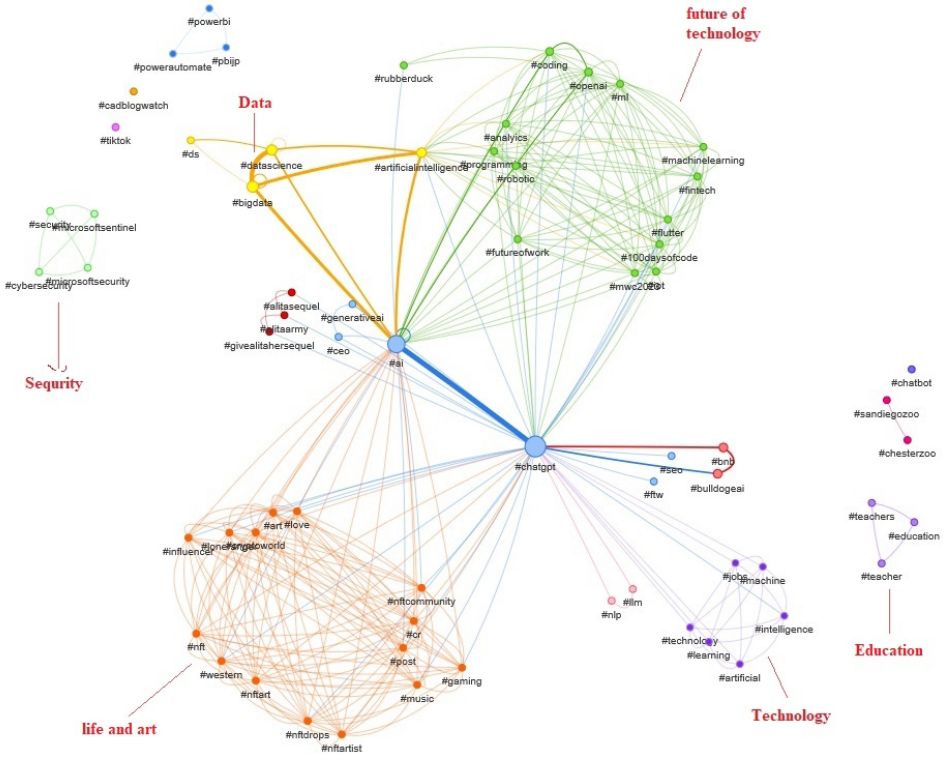
To name the clusters that form in social networks, we used the thematic content analysis technique. Thematic content analysis identifies patterns and concepts based on the similarities and differences in the examined content (top words or hashtags). This technique provides an analytical framework for uncovering hidden structures within the whole. Thomas and Harden (2008) identified three basic steps in this analysis: (1) coding the data line by line, (2) organizing the codes to develop descriptive themes, and (3) integrating the themes to form comprehensive themes. In this research, the steps recommended by Thomas and Harden (2008) were followed.

The COPE (Committee on Publication Ethics) has been followed in this research. The main ethical considerations in this research were protection of the participants' privacy. Tweets data have been anonymized with the themes and keywords. Participants' names were not used in the text of the article.

3. Results

The prominent hashtags in the analyzed posts were identified as #chatgpt (17), #ai (13), #bigdata (6), #datascience (5), and #artificialintelligence (4). The network formed by the hashtags used in 100 posts is presented in Figure 2 below.

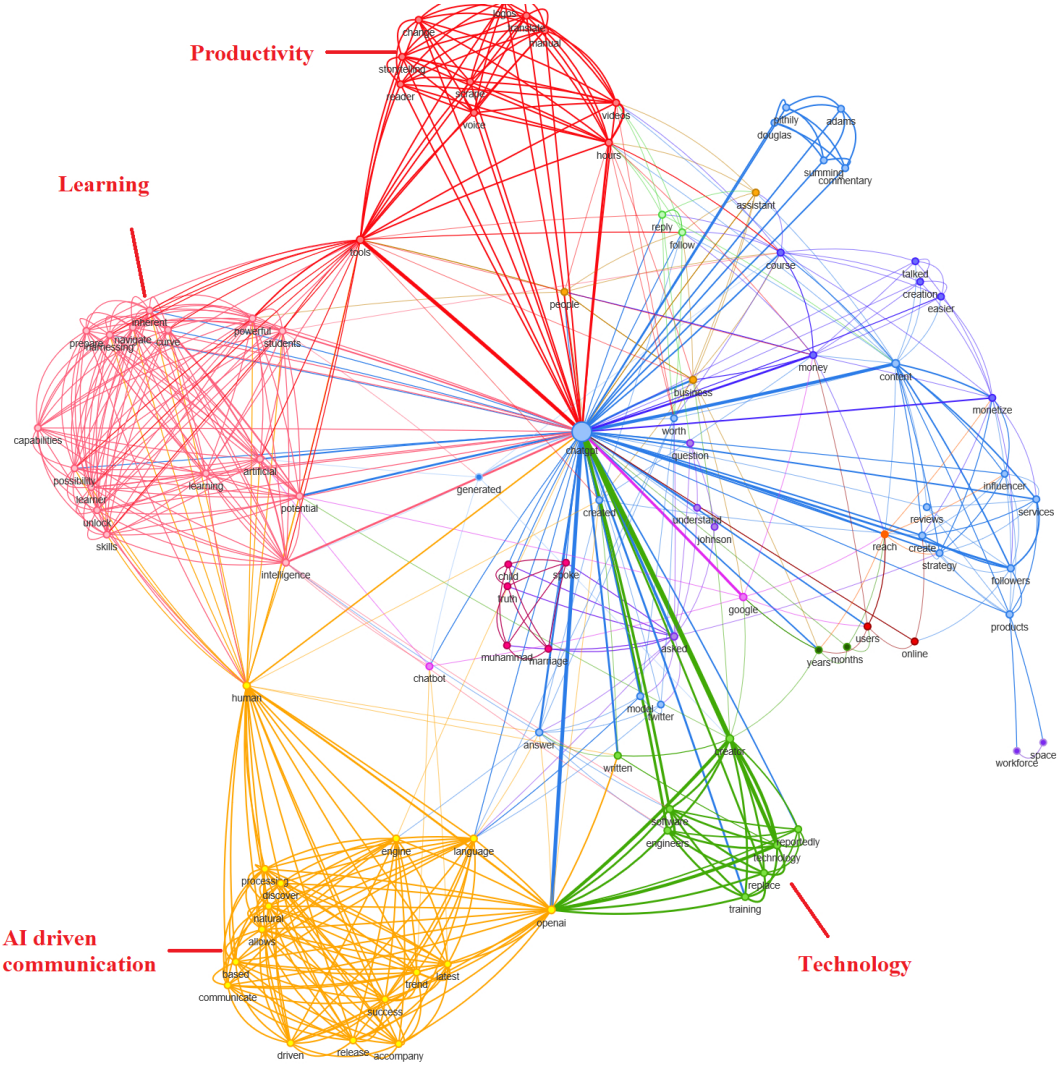
Figure 2. *Network map of hashtags on ChatGPT*



Six clusters were distinguished in the hashtag network. We analyzed the hashtags gathered in these clusters using thematic content analysis. The themes we identified in order of importance were life and art, future technology, data, technology, security, and education.

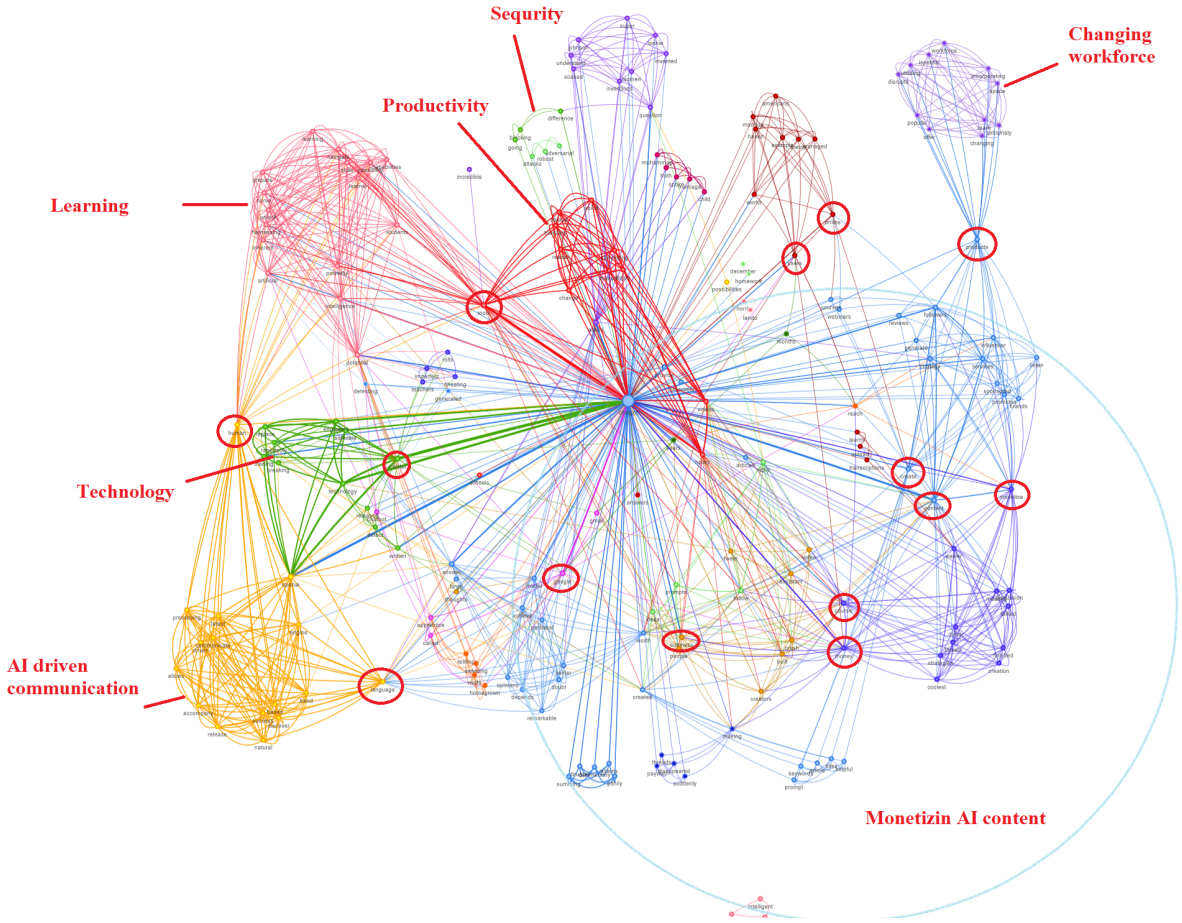
The top words used in the tweets were chatgpt (89), openai (10), content (10), tools (9), creator (9), technology (7), human (6), google (6), language (5), and products (5). We inferred from the top words that ChatGPT is primarily perceived as a content creation tool. The network map of the top 100 keywords used in the 100 tweets is presented in Figure 3 below.

Figure 3. *Network map of top 100 words*



We have identified 4 clusters in the top 100 keyword network. We analyzed the words in these clusters using thematic content analysis. According to the importance of the themes obtained, these are learning, AI-driven communication, productivity, and technology, respectively. The theme of technology emerged in both hashtag and top 100 keyword networks. This finding is not surprising since the opinions related to ChatGPT, which is an artificial intelligence technology, were analyzed. However, the emergence of education-learning themes in both analyses is noteworthy. This finding suggests that ChatGPT is particularly focused on learning and educational use. As seen in the figure, the key words on the right side of the network did not form clear clusters, so we also analyzed the top 200 words network. The network map of the top 200 words is presented in Figure 4.

Figure 4. *Network map of top 200 words*



The network structure of the top 200 words mentioned in tweets about ChatGPT confirmed the findings obtained from the analysis of the top 100 words. In addition, we identified two new themes related to the commercial aspect of ChatGPT. The first one is the changing workforce theme, which is quite clearly clustered. The second one is the monetizing ai content theme, which has an unstable cluster structure and consists of multiple sub-themes such as earning easy money from content, new marketing techniques, increasing followers of influencers, emergence of new business areas, alternatives to Google, and smart assistants. However, when the connecting words in the green circle are examined, concepts such as money, monetize, business, Google, create, content, and course are found. Therefore, we decided to combine them under the monetizing ai content main theme. We also identified strong connecting nodes in the rest of the network. The most remarkable ones are the human, tools, products, and language nodes. The human node strongly connects the ai driven communication and learning clusters, while the tools node links the productivity and learning themes. The language node serves as the connecting node between monetizing ai content and ai driven communication, while the products node connects monetizing ai content and changing workforce.

4. Discussion and conclusions

The findings of this study, which aimed to demonstrate the impact of ChatGPT on X users, indicate that ChatGPT can be a versatile model that can be applied to various tasks for different purposes. In the study, we analyzed the most popular 100 tweets between November 30, 2022 and February 1, 2023 in which ChatGPT was used. We found that the tweets were grouped under six different hashtag themes: life and art, future technology, data, technology, security, and education. One of the most important

findings from the hashtag analysis is related to how ChatGPT is perceived. The obtained themes showed that ChatGPT is perceived as a content creation tool. This perception seems to be in line with the structural nature of the Generative Pre-trained Transformer (GPT) model. In the top 100-word network, the themes of learning, AI-driven communication, productivity, and technology stood out according to their weights. It is noteworthy that technology and learning-education themes were present in both analyses. This finding emphasizes the potential of ChatGPT to be used for learning and education purposes as an innovative technology.

In the literature, it is possible to come across many studies proving that artificial intelligence has played a leading role in the emergence of technological innovations in many areas over the past few years. One of the areas where artificial intelligence has been applied and has had a great impact is education. In particular, integrating artificial intelligence into various applications such as mobile devices, robots, and games to facilitate education and learning has become widespread (Chen et al., 2022). Artificial intelligence enables personalized and adaptive teaching methods, which provide special support and increase awareness of knowledge gaps, to be more effective and efficient (Guan et al., 2020). The use of language models like ChatGPT in education appears as a potential area of interest due to their rich and wide range of applications (Firat, 2023a). Using these models, it will be possible to create personalized and effective learning experiences for individuals at every level of education, in line with each individual's unique learning preferences, abilities, and needs (Kasneci, 2023). Rudolph et al. (2023) pointed out that using artificial intelligence applications such as ChatGPT in time-consuming tasks such as evaluation is an important opportunity for improving teacher skills. Teachers can benefit from ChatGPT to develop their teaching strategies and allocate more time to individual students (Firat, 2023a).

In the network analysis of the top 200 words, two main themes were identified related to the commercial aspect of ChatGPT: changing workforce and monetizing AI content. These findings are consistent with existing literature. The "impact on business development changing" theme of Haque et al. (2002) and the "impacting humans" theme of Taecharungroj (2023) align with our themes of changing workforce and monetizing AI content. The ability of AI to process large amounts of data at low cost demonstrates its potential significance in marketing (Huang & Rust, 2021). Furthermore, the "productivity" theme can be said to overlap with the "Entertainment and Exercising Creativity" section of Haque et al. (2022). ChatGPT's ability to generate various types of content, such as essays, prompts, code, and interviews, in a way that is similar to what a human could produce, is believed to play a significant role in the emergence of the "creativity" and "productivity" themes.

Since its inception, ChatGPT has experienced a significant rise in popularity, with a plethora of opinions emerging regarding its diverse applications. In this study, we rigorously analyzed the top 100 X posts pertaining to ChatGPT, which debuted in November 2022, employing social network analysis. The analysis was conducted on SocioViz, utilizing the ForceAtlas2 algorithm. Through our exhaustive analysis, we identified nine overarching themes: life and art, future technology, data, security, education and learning, AI-mediated communication, productivity, workforce transformation, and monetization of AI content.

Our research findings have yielded several salient insights. We executed a thematic content analysis on the hashtags present in the social network analysis, and discerned themes including life and art, future technology, data, security, and education. Additionally, an analysis of the most prominent keywords led to the identification of learning, AI-mediated communication, productivity, and technology. Notably, both hashtag and keyword analyses highlighted the prominence of technology, coupled with learning and education. A noteworthy observation was the strong interlinkage between the human node in AI-mediated communication and the education-learning cluster. The tools node also exhibited an association between productivity and education-learning themes. These observations underscore ChatGPT's burgeoning interest within educational domains, primarily attributed to its anthropomorphic AI-mediated communication capabilities. Moreover, ChatGPT is perceived as an instrumental tool for enhancing productivity within educational settings.

In an extension to the analysis with the top 100 keywords, we expanded our scope to encompass

the top 200 keywords. This enabled us to unearth two additional themes through social network and thematic analysis - workforce transformation and monetization of AI content. The keyword "products" served as the nexus between these two themes. These insights suggest that ChatGPT, as one of the early triumphant exemplars of artificial intelligence, has considerable influence on production-centric business processes. The analyzed posts insinuate the potential of AI in transforming the business landscape. Predominantly, there is a consensus on the efficacy of AI in expediting content production and revisions. Supporting sub-themes encompass streamlined monetization through content, novel marketing strategies, bolstering influencer followings, the advent of new business verticals, potential alternatives to established platforms such as Google, and the emergence of intelligent assistants.

4.1 Limitations and Suggestions

This research is circumscribed by the Social Network Analysis (SNA) of the top 100 tweets encompassing ChatGPT within a narrow timeframe from January 26 to February 1, 2023. Given the accelerated trajectory of ChatGPT's popularity, the dataset represents a snapshot, and the volume of tweets and discussions has since proliferated. A more exhaustive SNA could be achieved through the aggregation and analysis of an extended dataset, spanning a more extensive time frame. Finally, based on the findings of this research, it is possible to list some suggestions:

- *Integration of AI in Education:* Our findings underscore the significance of integrating AI into educational platforms. The expansion of integration avenues, such as ChatGPT's Learning Management System (LMS) integration as highlighted by Firat (2023b), will bolster the employment of AI for educational objectives. AI has the potential to alter individual learning habits and behaviors, with ChatGPT being particularly beneficial for students in areas like homework assistance. Hence, it is imperative for educational institutions to make the necessary preparations for incorporating AI into curricular programs and activities. For instance, implementing GPT Output Detectors can be an effective measure to identify content generated through AI.
- *Navigating Workforce Transformation and AI Monetization:* The themes of workforce transformation and monetization of AI content emerged prominently in our analysis. This suggests that AI, and ChatGPT in particular, exerts a profound influence on the business landscape. Given the rapid pace of AI adoption, it is paramount for industries to swiftly adapt to these changes. Experimental studies aimed at understanding the actual impact and validating the predictions concerning ChatGPT will be instrumental.
- *Addressing the Transition to Paid Models:* As of May 2023, ChatGPT's transition from a free model to a paid model, particularly after achieving an excess of 100 million daily users, is noteworthy. This shift may affect accessibility and user dynamics. It is crucial to monitor and assess the impact of this transition on user engagement and application in various domains.

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Building learning communities through online learning for English language teachers

Crear comunidades de aprendizaje a través del aprendizaje en línea para profesores de Ingles

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Abstract

With the rapid development of the fourth industrial revolution, online education has become essential because of its practical needs. By building learning communities in an online learning environment fosters collaboration, shared expertise, and continuous professional growth. The article analyzes the benefits and necessity of online learning for English language teachers. The research has a quantitative approach with a descriptive design to investigate the building learning communities through online learning for English language teachers at the University of Khanh Hoa. This approach allowed us to gather numerical data and analyze trends, while the descriptive nature of the research design provided a comprehensive understanding of the current status and impact of online learning communities. The result of the study clarifies the expectations of online learning for professional development, including fostering collaboration, shared expertise, continuous professional growth, engaging teachers form connections, seek advice, share insights, leading to an increased sense of professional fulfillment and enriching the teaching experience for English language educators at the University. These communities facilitate the exchange of ideas, enhance teaching practices, and contribute to a vibrant professional network. By fostering a culture of collaboration and continuous learning, the University can empower its English language teachers to excel in their roles and create a more engaging and effective learning environment for their students.

Keywords: online learning, English language teachers, learning community, industrial revolution, professional development, technological changes.

Resumen

Con el rápido desarrollo de la Cuarta Revolución Industrial, el aprendizaje en línea se ha vuelto esencial por sus necesidades prácticas. La creación de comunidades de aprendizaje en un entorno de aprendizaje en línea fomenta la colaboración, la experiencia compartida y el crecimiento profesional continuo. Este artículo analiza las ventajas y la necesidad del aprendizaje en línea para el profesorado de inglés. La investigación tiene un enfoque cuantitativo con un diseño descriptivo para investigar la construcción de comunidades de aprendizaje a través del aprendizaje en línea para el profesorado de inglés en la Universidad de Khanh Hoa. Este enfoque permitió recopilar datos numéricos y analizar tendencias, mientras que la naturaleza descriptiva del diseño proporcionó una comprensión exhaustiva de la situación actual y el impacto de las comunidades de aprendizaje en línea. El resultado aclara las expectativas del aprendizaje en línea para el desarrollo profesional, incluido el fomento de la colaboración, experiencia compartida, crecimiento profesional continuo, participación del profesorado en la creación de conexiones, búsqueda de asesoramiento, e intercambio de ideas, lo que lleva a un mayor sentido de realización profesional y enriquece la experiencia docente del profesorado de inglés en la Universidad. Estas comunidades facilitan el intercambio de ideas, mejoran las prácticas docentes y contribuyen a crear una red profesional dinámica. Al fomentar una cultura de colaboración y aprendizaje continuo, la Universidad puede capacitar a sus profesores de inglés para superar sus funciones y crear un entorno de aprendizaje más atractivo y eficaz para sus estudiantes.

Palabras clave: aprendizaje en línea, profesorado de inglés, comunidad de aprendizaje, revolución industrial, desarrollo profesional, cambios tecnológicos.

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1. Introduction

The Fourth Industrial Revolution brought many advantages in education. Education can leverage online platforms, online courses, digital learning materials, learning videos, and other online resources to provide diverse and rich knowledge to learners. Teachers can use advanced technology to create innovative, flexible and interactive teaching methods. Education can focus on developing STEM skills, creative thinking skills, problem-solving abilities, life skills, and teamwork abilities. Education can provide advanced courses and continuous training to improve qualifications and adapt to technological changes and the labor market. Inclusive cooperation and connectivity in education play an essential role in meeting the challenges and opportunities of today's world. Schools and educational institutions can work together to share materials, teaching methods, experiences, and resources. This cooperation can take place at local, national and international levels. It may include the organization of joint courses, the exchange of lecturers and students, or the building of collaborative networks between schools and educational institutions. Education can facilitate connections and collaborations among different sectors, including industry, research, government, and society. This connection helps build bridges between education and the real world, and encourages the sharing of knowledge, experience and resources across disciplines to meet modern requirements and challenges.

To meet the needs of society, higher education needs to prepare and train human resources with appropriate knowledge and skills. This includes providing knowledge in artificial intelligence, information technology, data management, and soft skills such as creative thinking, problem-solving, and teamwork. Higher education has an important role in encouraging creativity and research in new technological fields. This can be done through creating appropriate learning and research environments, providing resources and financial support for research projects and entrepreneurships, and creating flexible and up-to-date learning programs in response to rapid technological change. Higher education can promote interdisciplinary and combined training by offering multidisciplinary learning programs that allow students to study and work in competitive environments.

In Vietnam, to take advantage of the advantages brought by the industrial revolution, the government has promoted the training of high-quality human resources. To do that, universities have started by improving the teaching staff in general and English lecturers in particular. At the University of Khanh Hoa, online learning for professional improvement has been focused in recent years. Learning in this form initially shows that there are certain achievements (McConnell et al., 2013) that have been stated in terms of building professional learning communities. Also, online learning for professional development will help lecturers manage time and distance well. Learners can be proactive about their time to focus on learning at any time. As (Ching & Hursh, 2014) said, the method of learning online learning is improving because of the efforts of all parties. Online learning enhances learner-expert interaction (Prenger et al., 2017; Sprague, 2006; Dede et al., 2009)

The study of online learning plays a very important role for English lecturers in general and English lecturers at the University of Khanh Hoa in particular for the following reasons: Online learning research provides English lecturers with access to materials, sources of knowledge and the latest research in the field of English and language teaching. Online research and learning help teachers update their knowledge and develop the latest teaching methods to apply in the classroom; Online research and learning helps English language instructors develop technology skills and use online tools and platforms to interact with students and deliver learning content. Instructors can learn how to use teaching technologies such as: learning management systems, learning videos, learning software, and mobile applications to create a better learning experience; Online research and learning allows English language instructors to learn and apply interactive online methods to interact with and support students. Tools such as online forums, live chats, and instant feedback systems help instructors reach and interact with students remotely. This opens up opportunities to create diverse learning environments and stimulates student engagement and collaboration.

The development of information technology has contributed to the development of education in recent years. That growth has spurred the learning community to flourish. In addition, online learning also facilitates English language teachers to impro-

ve their expertise, research and training, as well as academic exchanges. Therefore, online learning is an environment for English lecturers to interact, exchange, learn and share teaching and research experiences with each other.

1.1 Research questions

To conduct research for this topic, the author posed the following three research questions:

- What role does online learning play for English teachers at the University of Khanh Hoa?
- What are the advantages and limitations of online learning for the professional development of English lecturers at the University of Khanh Hoa?
- What are the suggestions for building online learning and professional development for English language teachers today?

1.2 Theoretical basis

Online education is a form of learning that takes place on the Internet. It is often referred to as "*eLearning*" (Cross, 2004; Nichols, 2003) in a number of other terms. The first online classes were launched in 1986 by John F. Kennedy University in California – USA. Learning and material delivery through online software and other mobile applications. The outstanding feature of online training is the high interaction and diversity between lecturers and learners. Under that feature, instructors and learners can communicate directly with each other through applications: chat, zoom, email, forums, webinars, etc. The study of online education has created forums for serious discussion, and from these discussions, scientists have differing views (Singh & Thurman, 2019): "We collected 46 definitions from 37 resources and conducted a content analysis on these sets of definitions"(Martin et al., 2020) suggested that between 2009 and 2018, there were 619 articles mentioning online education. In addition, there are also many authors who have evaluated online education (Castro & Tumibay, 2021), online education after COVID-19 (Castro & Tumibay, 2021; Chakraborty et al., 2021; Paudel, 2021; Dhawan, 2020). These views are aligned, but there are gaps between them that need to be filled. From research, I found that the reason for the difference is due to different approaches and practices. In addition, the strong development of information technology has made its specific definitions obsolete. I found that the emergence of the internet will bring researchers on this issue closer together.

Online professional learning communities (Gorham & Ogata, 2020) is an online environment created to connect and interact between experts, professionals, and learners in a specific field. The goal of this community is to share knowledge, experiences, ideas and create professional development for its members. Forums and social networks allow experts and learners in the same field to interact, ask questions, and share expertise. Members can discuss industry-related issues, seek solutions, and create professional relationships. Members can participate in online courses, discuss with faculty and other students, share ideas, and receive feedback on academic work. Online seminars and events in the professional field provide opportunities for professionals and learners to network, share research, present presentations, and discuss professional topics. Members can share resources, assign tasks, and support each other during research (Zhang & Liu, 2019; Goodyear et al., 2019; Yu & Chao, 2022; Verdi, 2022; Gore & Rosser, 2022; Tipping & Dennis, 2022). In *online professional learning communities*, learners can reflect and collaborate with each other and with experts outside their organization using the Internet and mobile technology, as well as access information and other resources with few restrictions on time, place, or speed. *Online professional learning communities*, human beings who communicate online and share common interests, goals, knowledge, and ideas. This exchange of information benefits the entire community. (Bedford, 2019) emphasizes online professional learning represented by a variety of software and the viewer can be supported using information technology. In addition, some argue that online professional learning will help us human beings push boundaries (O'Toole, 2019; Prado et al., 2022; Birch & Lewis, 2020; Cullinane et al., 2022; Akoglu et al., 2019; Tulowitzki, 2021). In the process, the teacher will benefit from this program and guide learners on how to approach them to master knowledge. It is clear that the online professional learning mentioned here is an educational model in which from teachers to administrators, educational institutions can learn and share experiences and ideas to improve the qua-

lity of education. As such, the question is, what are the benefits of online professional learning?

To answer the above question, I think that the benefits of online professional learning are flexibility. Knowledge transmitters can exchange information quickly thanks to the internet. Online learning will help teachers and learners have more time and space for exchange; minimize costs; provide opportunities to better meet individual academic interests and goals; benefiting various educational development goals; provide comprehensive and timely access to valuable internal resources, such as stored data, as well as resources that are not available locally, such as professional knowledge; prompt guidance to the teacher in the implementation of pedagogy; timely professional advice and design authorization, collect data and evaluate flexibly.

Face-to-face learning is the reason why English teachers face barriers such as: the difficulty of arranging time in accordance with the class organizers, flexibility in creating learning and exchange environments, lack of resources. These barriers can be addressed by online professional learning. In online professional learning environments, the utility of digital enables teachers to solve problems, plan, curriculum, evaluate and reflect proactively (Hawari & Noor, 2020; Kim et al., 2022; Churchill, 2020; Chang et al., 2022; Li et al., 2022). In this environment, learners return to their inherent "subject " position. Lecturers go from being engaged in learning to becoming important nodes of network development. From this approach, English teachers began to apply digital tools for learners to move from a "*verb*" state to a "*master*" state from". Professional online professional learning not only promotes teachers' capacity to develop but also helps them innovate teaching methods which promotes learner learning performance (Jia et al., 2022; Li et al., 2020; Wang & Zhu, 2019; Alomari et al., 2019; Huang et al., 2020). Professional online learning methods will help teachers move from a physical teaching environment to a real environment virtual reality. This transformation will bring many advantages to teachers, learners and education administrators. The use of a professional online professional learning environment is one of the strategies to promote professional success. Current research has shown that the integrated flexibility of online environments offers many benefits, including allowing teachers to absorb topics and materials in a convenient way. I think that, in the future, learning a professional online learning environment, the teacher will become a designer. There, teaching and learners will break down the barriers of time and learning space, since teaching will shift to exchange information and knowledge.

2. Research methodology

To investigate the topic of online learning for professional development for English language lecturers at the University of Khanh Hoa, the following research methods were used:

To conduct the study, a survey and evaluation on the use of online learning and its role in the professional development of English language teachers at the University of Khanh Hoa were carried out. The survey and evaluation method allowed to gather information from a rich source of data. By conducting surveys and interviews, I could collect opinions, viewpoints and experiences from research participants, which helped to better understand the views and opinions of English lecturers at the University of Khanh Hoa on the role of online learning. This method aided to identify the data pattern accurately and represented the focus group to study. By choosing a representative sample data, the article will ensure the accuracy and reliability of the research results. Survey and evaluation methods provided digitized and quantitative data, to apply statistical analysis methods to dig deeper into relationships and trends. By analyzing the data, conclusions can be drawn and assertions about online learning in professional development for English language teachers are made.

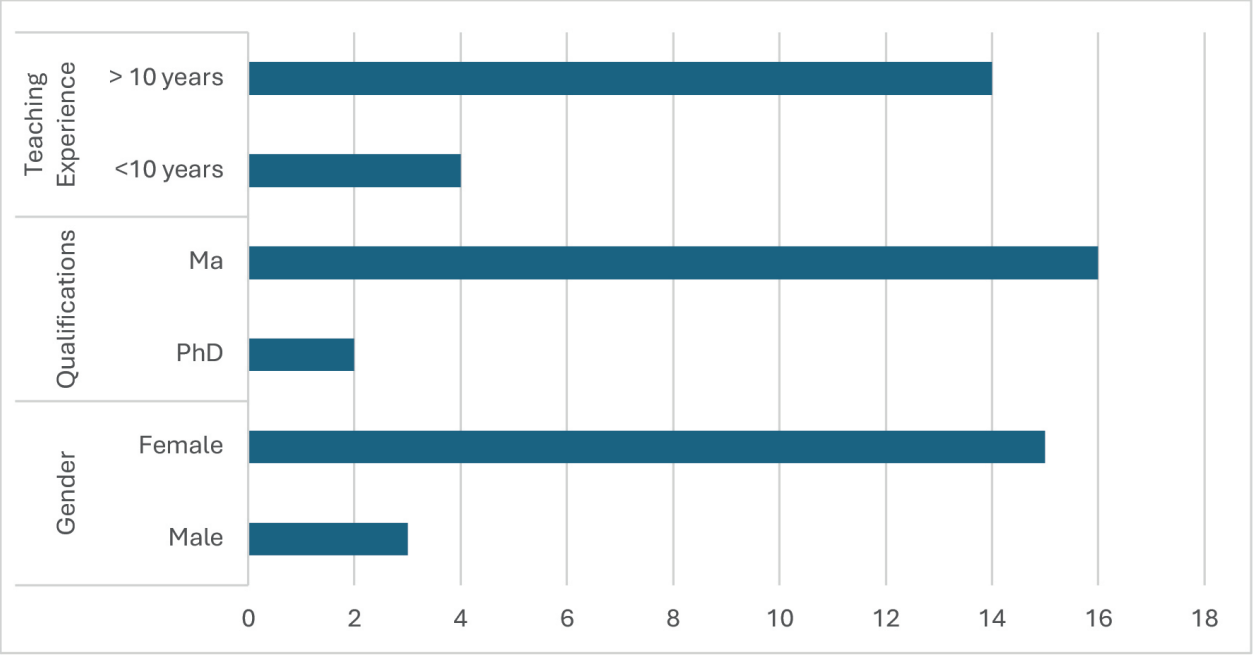
Surveys and interviews to collect information about teachers' views, experiences and opinions on online learning were used. This method helped to directly interact with lecturers. In this way, personal views, and feelings about the role of online learning can be better understood. This enabled to build an overall and multidimensional picture of the research topic. This method was used to capture insights from individuals and create direct relationships with faculty. Ask specific questions and get a variety of answers in order to dive deeper into teacher's experiences and perspectives on e-learning. Studying in person or through materials to better understand the realities and challenges teachers face during online learning. Using survey, interview and observational

methods will diversify information and consider a variety of perspectives on the role of online learning.

In order to have a multidimensional approach, it is important to understand and analyze the research findings of previous works related to online learning in professional development for English language teachers. This approach gives an overview of the current situation and research trends that have been carried out in the field.

For successful research, a specific plan to answer the questions was made. These samples were surveyed among 18 faculty members, including 16.6% male and 83.3% female. Qualifications include: 100% have completed a master's program, whereof 11.1% have completed a doctoral program. Teaching experience, 22.2% of lecturers have less than 10 years of teaching time, 77.7% of lecturers have more than 10 years of teaching time.

Table 1. *Demographic information of participants*

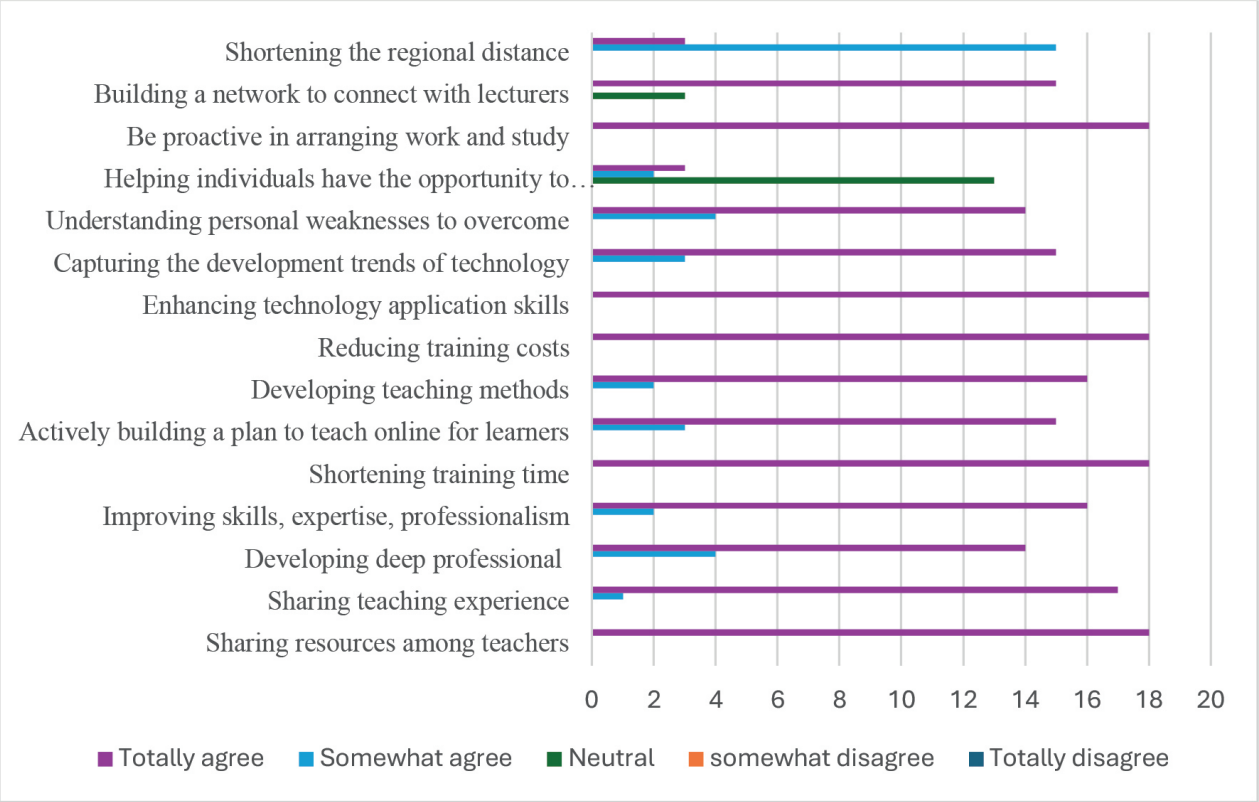


To conduct research and collect data, an online and in-person survey were applied in May 2023 to assess the primacy and necessity of virtual professional learning for professional development of English language teachers at the University of Khanh Hoa. This survey was conducted in a convenient way, with acceptable survey methods, wide survey scope, large samples, survey costs low environmental protection because there is no waste from it (Nayak & Narayan, 2019; Andrade, 2020; Ball, 2019). Survey questions were designed around learning materials for teachers' professional development. The questionnaire was designed with 15 multiple choice questions and 17 open-ended questions. The validity and reliability of the questionnaire was established when Cronbach's Alpha coefficient of all entries was greater than 0.6 (Li, 2021). This questionnaire system was initially experimented with 10 randomly selected instructors. The experiment showed that respondents struggled with some of the answers provided. They felt that the answers did not cover all the views they expected. Faced with this situation, the author has adjusted the answer plan to solve the above situation with the value of "undecided".

3. Results

The survey was conducted using the Google App and sent to English lecturers at University of Khanh Hoa. The study applied descriptive research methods to analyze the data obtained, and its findings focused on key aspects such as: benefits of online learning, the need for online professional learning, and expectations for online professional learning.

Table 2. *Benefits of online professional learning*



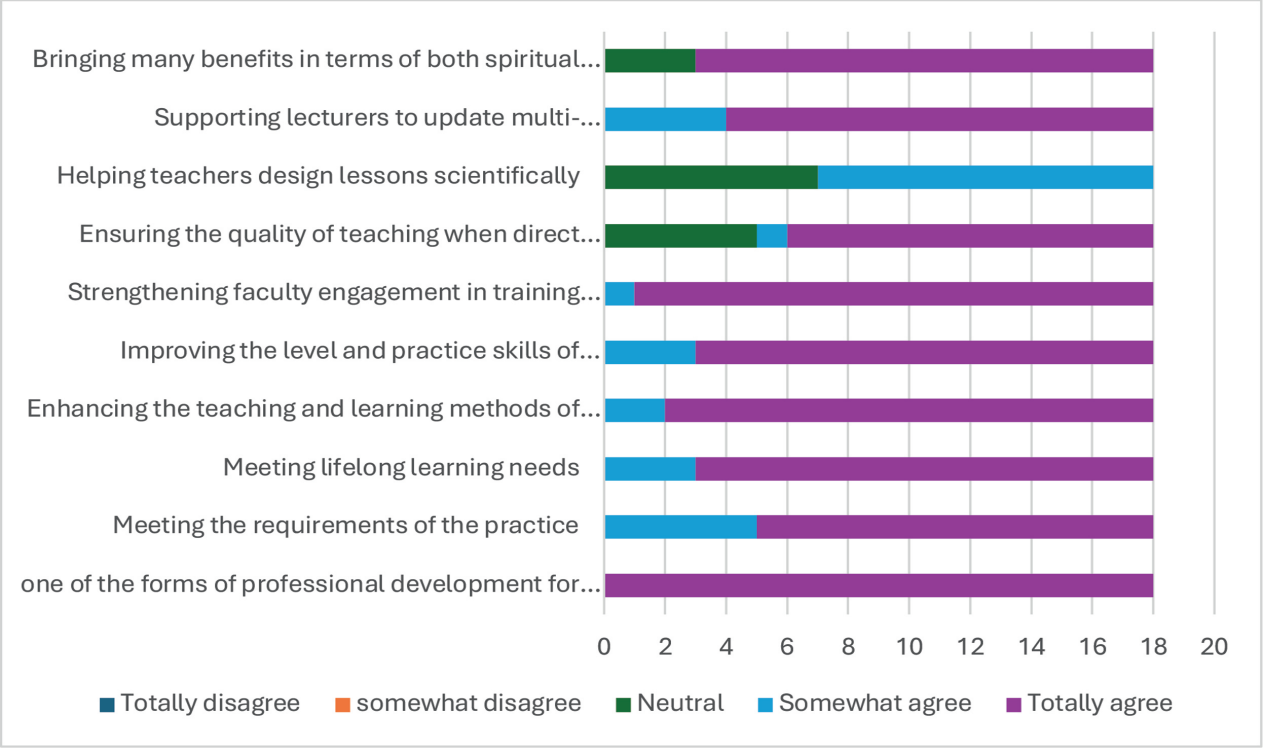
From the above data, 100% of trainers believe that the benefits of online professional learning are the sharing of resources among trainers, the shortening of training time, and the cost of training, improve skills in applying technology to teaching.

94.4% of lecturers said online professional learning helped them share their teaching experiences. This suggests the opportunity to reach out and learn from other instructors in an online environment. 77.8% stated that online learning has helped them develop deep expertise. So they have the opportunity to access new knowledge and improve their qualifications through online courses. 88.9% affirmed that online learning has helped them enhance their skills, expertise and professionalism. This proves that they have learned new skills and applied them to their teaching. 83.3% ensured that online learning has helped them proactively develop plans for online teaching to learners. This suggests that they have embraced methods, tools, and resources to create a better online learning experience for learners. 88.9% said that online learning helped them develop teaching methods. This proves that they have explored and applied new teaching methods in an online environment. 83.3% affirmed that online learning has helped them grasp the evolving trends of technology. This reveals that they have approached and mastered new technologies to use in the online teaching process. 77.8% agreed that online learning helped them better understand personal weaknesses and overcome them. This shows that they have identified areas where they need to improve and take measures to overcome those weaknesses. 83.3% said that online learning has helped them build networks with other instructors. The findings reveal that they have had the opportunity to exchange, share and learn from the online faculty community, creating a network of links with people who share common interests and goals in the field of teaching. The data shows that online professional learning has benefited faculty by helping them understand personal weaknesses and develop skills, as well as building networks to interact with and learn from other faculty communities.

72.2% said that online professional learning is beneficial in faster advancement. The data reveal that accessing and learning from online courses and materials help individuals develop skills and knowledge, thereby creating opportunities for career

advancement. 16.7% cited the benefit of online professional learning as the ability to network with faculty. The data underscore that online learning provides opportunities to interact and connect with expert lecturers in the field, which in turn supports learning and knowledge sharing.

Table 3. *English teachers' comments on professional learning online*



From the data, 100% fully agreed that online professional learning is one of the forms of professional development for faculty. This indicates an acknowledgment and appreciation of the role of online professional learning in providing opportunities for faculty to develop and enhance their professional qualifications. 72.2% strongly agreed that online professional learning meets the requirements of practice. This reveals a strong and widespread belief among survey participants regarding the positive impact of online professional learning on faculty members. This suggests that online learning provides the knowledge and practical skills needed to apply in the daily work of faculty. 83.3% of recognized that online professional learning meets the need for lifelong learning. This indicates that they see the value of online learning not only as a short-term process, but also as a tool to continue to grow and update their knowledge throughout their professional lives. 88.9% admitted that online professional learning enhances the learning and teaching methods of faculty. This indicates that online learning brings new tools and methods to improve the quality of learning and teaching. 83.3% agreed that online professional learning enhances information technology practical skills. This underscores that they see the value of online learning in providing the knowledge and skills needed to work with and apply information technology in the field of teaching. 94.4% strongly agreed that online professional learning enhances faculty engagement within the institution. This shows that they see the value of online learning in creating cohesion and interaction between lecturers and institutions, thereby improving the quality of teaching and learning experience. 66.7% strongly accepted that online professional learning ensures teaching quality when face-to-face teaching does not achieve results. The data highlights that online learning can be an effective alternative when traditional forms of teaching do not deliver the desired results. Nobody agreed that online professional learning helps lecturers design lectures scientifically. This suggests that there is a dis-

cernment in the opinions of survey participants, and there may be different opinions about the possibility of online learning in designing lessons. 77.8% strongly agreed that online professional learning supports teachers to update multidimensional knowledge. This demonstrates that they see the value of online learning in accessing and capturing new and diverse knowledge from online resources and courses. 83.3% strongly agreed that online professional learning has many benefits in terms of mental and material benefits. The data indicates that they see the immense value of online professional learning in many aspects, including emotional impact and material impact. It can provide satisfaction and motivation to instructors of the faculty because of the opportunity to develop and enhance their professional qualifications. Satisfaction and confidence in acquiring new knowledge can also enhance work ethic and passion in teaching. Online professional learning can help instructors save time and costs on travel, space, and resources. They can access and learn from online courses in the comfort of their own homes or from any location with an internet connection. This can help teachers make the most of available time and resources to achieve better learning outcomes.

27.8% had a neutral opinion on online professional learning, ensuring the quality of teaching when face-to-face teaching does not achieve results. This suggests that there are participants who do not have a clear view or are unsure about the ability of online professional learning to ensure teaching quality. They may have had a negative experience or haven't seen a clear effect from it. 38.9% gave a neutral opinion that online professional learning helps teachers design lectures scientifically. However, both of these neutral opinions (27.8% and 38.9%) were quite high, indicating uncertainty and diversity of conceptions on the part of respondents about the ability of online professional learning to ensure the quality of teaching and scientific lesson design.

4. Discussion and conclusions

From the survey data, English language teaching lecturers at the Khanh Hoa University have highly appreciated the importance of online professional learning for their professional development. Lecturers are aware that, the increasing learning requirements of learners in order to provide high-quality human resources for society, they must continuously improve their teaching and research abilities. Nowadays, online learning is present in all educational levels, giving learners the opportunity to be connected with teachers, partners, educational contents and pedagogical resources, which increase motivation and participation (Campos, et al., 2020); that is why one of the optimal solutions offered is to participate in online professional learning to share teaching experiences and skills with colleagues. This sharing will help English teachers solve work-related problems quickly and effectively. In fact, the majority of English teachers support the promotion of online professional learning and they expect this model to be implemented quickly.

In addition, English instructors believe that the implementation of online professional learning is fully in line with the 4th industrial revolution takes place. This revolution will blur the boundaries of perception to build a flat world. For online professional learning to become a trend, it is essential to reflect and develop new strategies since it not only enhances the expertise of lecturers but also shares learning resources among the internal and external school lecturers, which is a challenge, since the use of online resources can foster English teachers' creativity and students' critical thinking (Féliz et al., 2023).

In order to implement online learning for professional development at Khanh Hoa University, it is necessary to have a development orientation and regular check on its operation. Frequently evaluate the effectiveness associated with the professional title of the lecturer. Online learning gives English teachers the opportunity to access new knowledge and update the latest trends and teaching methods. According to Martín (2020) it requires changes in the teacher's role to be a designer of learning situations. On an online platform, they have access to materials, courses, and a wealth of knowledge from leading experts across the globe. This helps lecturers improve their professional qualifications and provide students with the latest knowledge. Online learning grants an environment of interaction and networking with other faculties and peers around the world. English lecturers at the University of Khanh Hoa can participate in specialized forums, discussion groups, and social networks to exchange experiences and share the latest information. This helps them build a wider network of professional

connections, by enhancing their development and knowledge sharing. Online learning allows English teachers to familiarize themselves and improve their skills in using information technology, taking also into account that the ICT use has changed from the simple transmission of information to carrying out contents and new learning (Andraca et al., 2022). They will approach and work with online tools and applications, from participating in online courses to using online learning platforms and tools to create instructional content. This helps English teachers become creative and flexible in applying technology in the teaching and learning process.

From the research results, online professional learning for professional development for English lecturers is very necessary not only at the University of Khanh Hoa, but also at other educational institutions. This is one of the forms contributing to improving knowledge and skills for lecturers. It is shown that online training helps English teachers access the latest knowledge, resources and trends in the field of teaching and learning. This helps to update and improve the professional knowledge in the four skills: listening, speaking, reading and writing. Instructors can apply technologies and tools in the teaching process, create interactive and enjoyable learning experiences among students, and improve teaching effectiveness. Through participation in online courses and communities, instructors can share experiences, learn from others, and create opportunities for collaboration and professional development. Online learning makes it possible for English language teachers to integrate new technology and applications, leveraging online learning tools and platforms to create a modern learning environment tailored to students' needs.

Online training plays an important role in the professional development of English language teachers. It not only provides new knowledge and tools, but also opportunities for professional exchange and grasp new trends. From the analysis of English teachers' opinions, online professional learning can be extremely important for development expertise.

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Teacher knowledge: insights for continuing education in Southern Brazil

Conocimiento docente: perspectivas para la formación permanente en el sur de Brasil

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Abstract

The pandemic caused by Covid-19 has caused education, on a global scale, to face increasing challenges in considerable aspects, from the social and economic inequality of students and teachers to the so-called learning deficit at all levels. Considering the essential dialogue between the university, through its teacher education courses and the basic education school, an applied research project was developed (participatory action research) whose theme presupposes technological innovation from a double perspective, as a means and an end. Means, through the proposed teaching methodology, integrated with technology with a view to changes and innovation in the work processes of basic education teachers when implemented. End, considering the pedagogical products generated after implementing the methodology, digital learning objects that, by nature, encompass different technologies for learning purposes. Furthermore, through the effective participation of teachers linked to the action research proposal, the results suggest the effectiveness of teaching resignification, made possible by continuing education, regarding their role as mediators and curators of the pedagogical process, aware that their knowledge of teacher involves the content, pedagogical and technological dimensions, as well as the role of information and communication technologies as an integral part of their pedagogical work.

Keywords: ICT, TPACK, Participatory action research, Technological innovation, mediation, cultural tools.

Resumen

La pandemia causada por el Covid-19 ha provocado que la educación a nivel mundial se enfrente a desafíos cada vez mayores en numerosos aspectos, desde la desigualdad social y económica entre estudiantes y docentes hasta el llamado déficit de aprendizaje en todos los niveles. Considerando el imprescindible diálogo entre las universidades, a través de sus cursos de formación docente y las escuelas de educación básica, se llevó a cabo un proyecto de investigación aplicada (investigación acción participativa) cuya temática presupone la innovación tecnológica en una doble perspectiva, como medio y como fin. Medio, por la metodología de enseñanza propuesta, integrada con la tecnología, con miras a cambios e innovación en los procesos de trabajo de docentes de educación básica al implementarlos. Fin, considerando los productos pedagógicos generados tras la implementación de la metodología propuesta, objetos de aprendizaje digitales que, naturalmente, abarcan diferentes tecnologías con fines de aprendizaje. Además, a través de la participación efectiva de los docentes vinculados a la propuesta de investigación-acción, los resultados sugieren una efectiva redefinición de la enseñanza, posibilitada por la formación continua, en cuanto a su rol como mediadores y curadores del proceso pedagógico, conscientes de que su conocimiento como docente evoluciona los contenidos. dimensiones pedagógicas y tecnológicas, así como el papel de las tecnologías de la información y la comunicación como parte integral de la enseñanza.

Palabras clave: TIC, TPACK, Investigación acción participativa, Innovación tecnológica, mediación, herramientas culturales.

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1. Introduction

Pedagogical practices at different levels of education, especially in basic education, demand proposals capable of developing autonomy and innovation skills with teachers and their students. From this perspective, the Brazilian educational context has not been fierce regarding the theoretically based practices around Information and Communication Technologies (ICT) that, in fact, translate the potential of these instruments in dialogue with the historical-cultural context with which students interact.

However, there is some resistance to understanding the presence and role of ICT in education, be it face-to-face, e-learning or even blended, both on the part of basic education educators and teacher trainers. This movement has generated consequences that involve, today, in a post-pandemic scenario, the so-called learning "deficit", which can and should be urgently addressed and based on academic research in partnership with basic education. UNESCO (UN Brazil, 2020) has pointed out systemic repercussions in this regard, which involves numerous aspects beyond education itself, and which requires collective and collaborative efforts between governments, the private sector and civil society.

Specifically, it is essential to pay attention to the teaching role in this context of qualification and resolution of problems related to education in an adverse context like this one. More than pointing out gaps in their initial training or even lack of theoretical and methodological knowledge when it comes to educational technologies, it is crucial to have partnerships in order to establish dialogues, training, and methodological proposals regarding teaching practice.

In this sense, recent studies conducted by "Mongaba: education, languages and technology" Research Group have shown that the purely instrumental character involving ICT and education, i.e., the emphasis only on the use and on "teaching about ICT" as something separated from the pedagogical process is a reality arising from initial teacher education, with very significant consequences in the performance of these professionals in basic education.

Thus, "learning with, through and about" technologies in a transversal way and integrated with social practices and current demands in the 21st century, with a strong theoretical basis regarding its character as a cultural instrument that alters the flow of human actions, remains quite latent in the academic investigative scenario in the educational area in Brazil, as the studies have pointed out (Kurtz et al., 2021; Kurtz et al., 2022; Kurtz & Silva, 2023; Kurtz, 2023; Silva, 2020).

In this way, concepts and frameworks typical of the technological sphere have been almost "naturally" associated with the perspective of innovation in education in several areas. For some time now, the dimensions involving Artificial Intelligence (AI) in education (Luckin et al., 2016) and Computational Thinking (Wing, 2006; 2014; Bower & Lister, 2015; Duncan et al., 2017) and frameworks such as TPACK (Technological Pedagogical Content Knowledge) (Mishra & Koehler, 2006) have been gaining ground in the Brazilian literature, even if timidly, not only linked to the scope of innovation, but of knowledge necessary for all teachers and their students, in all areas of knowledge.

In this perspective, it is assumed in this research that continuing education is the most viable way to set a perennial process so that teachers can develop their skills and competences. It is considered the importance of continuous teacher education and the need for constant reflection on pedagogical practice, as well as critically reflecting on its performance. The exchange of experiences between educators and the collective construction of knowledge are crucial, aspects that were also verified in the scope of the research reported.

In the same way, the principles of Schön's "Reflective Teacher" (Schön, 1992; 2000) are considered as one constantly engaged in the critical analysis of his/her pedagogical practice, seeking to improve his/her teaching strategies, understand the students' needs and adapt his/her performance to the demands of the contemporary world. The continuing education of the reflective teacher provides a space for reflection and theoretical deepening, allowing the educator to be updated on the new approaches, methodologies and educational resources available. Ultimately, the process contributes to filling gaps in their initial education, expanding their practices and promoting a more dynamic and contextualized education.

Initiatives that consider the scenario of gaps in pedagogical terms with regard to the role and use of ICT in basic education need to consider both the blended context and the different applications and

technological environments that not only enable meaningful pedagogical practices, but also qualify and potentialize them in a context permeated and transformed by technologies. ICT are, therefore, cultural instruments, starting from the ideas of Vygotsky (2007; 2008), which, once inserted in human social and cultural systems, alter these practices as well as human cognitive functioning. Ideas from "neo-Vygotskian" researchers (Wertsch, 1988; 2002) are fundamental in the sense of relating historical-cultural studies to the understanding of the mind and human learning, in the sense that subjects learn and, therefore, develop.

Given this scenario, the main purpose of the research is to verify how teachers in basic education conceive the role of technologies for pedagogical purposes before and after taking a continuing education course based on the previous epistemological assumptions.This objective is built keeping in mind the fact that the so-called 21st century skills make the role of the teacher stand out. One cannot think about the pedagogical process without associating it with technological fluency, whether of the teacher or the student.

Thinking from this perspective is no longer limited to a self-absorbed activity, but a collective one. The computer, if understood as a cognitive tool (Jonassen, 2007), amplifies certain skills, like any other cultural tool, from the sociocultural perspective. Following this perspective, both cognitive processes and human actions are guided by cultural instruments used by subjects. New cultural conditions require new cognitive competences (composed, in turn, of a range of skills that constitute them). These conditions are effectively carried out in everyday life, since children and adolescents manipulate ICT in a very intimate way, often unlike their parents and teachers. On the other hand, this common sense does not produce an awareness of the new concepts, skills and abilities intertwined in the pedagogical scope, since it is necessary to enhance the development of theoretical knowledge of this new cultural condition that even changes the human biological functioning, under the Vygotskian perspective.

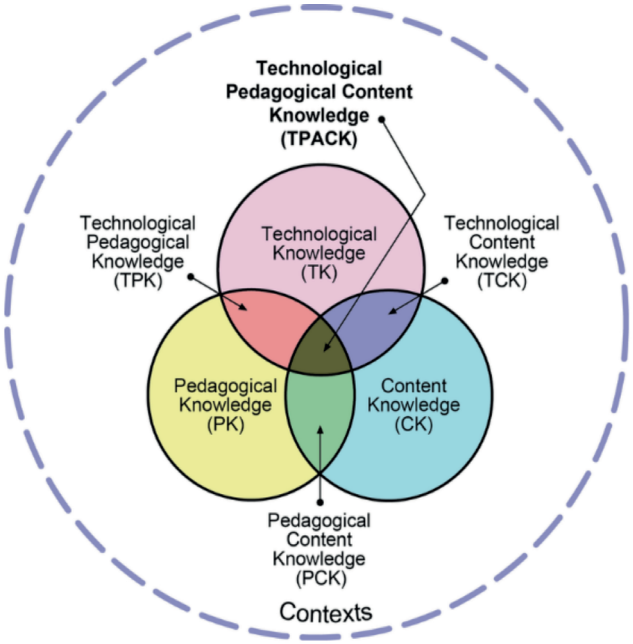
Thus, this report presents results from an umbrella project that investigates teacher education in different contexts, both in the south and northeast of Brazil. Specifically, it presents results based on research conducted in the southern region of the country, Rio Grande do Sul State, involving basic education teachers' self-perception of what constitutes teachers' knowledge, using the TPACK framework (Mishra & Koehler, 2006) as a basis. The research was selected and received funding from a public call by a Rio Grande do Sul Funding Agency (FAPERGS) in partnership with the National Funding Agency (SEBRAE/RS), for projects involving innovation in education in hybrid contexts (Proedu/2021 Call).

2. Rethinking initial and continuing education with, on, and through educational technologies

The context presented above demands an understanding that the changes necessary for education reach the classroom, as it is there that the process of effective construction of engaged, competent and socially empowered citizens takes place. School is guided by structures created in another historical context, visible in the means it uses and the objectives it aims at, which until recently made it impossible to make proposals that go beyond the so-called *status quo*.

Among these changes is the constitution of competences that associate the pedagogical dimension of content to the technological dimension, following the conceptual proposal of TPACK or "Technological Pedagogical Content Knowledge" (Figure 1), which expands Shulman's work (Shulman, 1986; 1987; 2004) from the proposal of North American researchers Punya Mishra and Matthew J. Koehler, from Michigan State University in 2006.

Figure 2. *TPACK (Mishra and Koehler, 2006)*



If we are – and this is not new in the educational sphere – in a new paradigm provoked by changes and drastic ruptures in the processes of human development and learning – obviously, new references guide the forms of interaction and social practices of the subjects. Therefore, new "pedagogical models" (teaching and learning relationships supported by learning theories) that, at their core, carry certain teaching methodologies, need to be developed.

Despite being investigated and disseminated in several countries for almost two decades, TPACK has shown itself in Brazil as something far from curricula and teaching methodologies, both in basic education and in initial teacher education. &, in a context/paradigm no longer characterized by the traditional and now outdated separation between "presence" and "distance" in social practices and education, in which "blended" becomes the protagonist, it is essential that these models are aligned with such context.

It is important to highlight that when it comes to articulating teaching and technology, for many educators the first movement is that of distancing, often linked to a concern of a technical and instrumental nature, something far from reflections articulated to theories and concepts that permeate and constitute the teaching profession itself. In many cases, there is a concern to reflect on aspects considered proper to "being a teacher of...", but when it comes to the role attributed to ICT in education, the subject becomes restricted to the "domain of...", as if these "orbited" instruments were external to the pedagogical process.

Based on these understandings, the need for "reflective practice" emerges (Schön, 2000). The reflection is linked to teacher education as an educational principle necessary for the innovation of knowledge that qualifies and questions what is taught, enhancing the transformation of pedagogical practices. It is important to assume that reflective practice provides teachers with means for their professional development, making them more aware and helping them gradually to distance themselves from impulsive and routine conduct. In this way, teachers can act intentionally, differentiating themselves as informed human beings, which is a characteristic of intelligent action (Dorigon & Romanowski, 2008).

It seems urgent to deconstruct the instrumental and technical conception of mere "use" of technologies in teaching, specially in preservice teachers' dimension, emphasizing the need for a pedagogical process that encompasses social and political aspects of ICT in the historical-social context and the role of the teacher in the midst of this scenario. Future teachers cannot be conceived from a paternalistic perspective, whose formation is merely technical, but rather as individuals capable of reflecting on the

world in which they critically and creatively live. The starting point for such a discussion should also involve the sociological and psychological prism regarding the use of ICT in the current context, in a transversal way, and not in one discipline or another, as our studies have shown (Kurtz & Silva, 2018; 2020; Kurtz et al., 2021). It is a pedagogical assumption that situates teaching and learning processes with, on and through technologies.

If models emerge at the core of new paradigms, and in education the so-called "pedagogical models" are associated with learning theories, such as Vygotsky's socio-interactionist, it is essential to pay attention to what configures teaching methodology in a blended context, considering scientifically supported proposals that combine numerous experiences in the field of education (García-Lázaro & Martin-Neto, 2023; Maureira-Cabrera et al., 2020; Daniels, 2016; van Huizen et al., 2005). The management or curatorship of the teaching process becomes the teacher's focus in the midst of this innovative scenario. The so-called "pedagogical distance" comes to be understood as the student's "cognitive presence".

However, can such skills and abilities be developed? Considering the Vygotskian historical-cultural approach, the issue of "being aware" of practices that already exist in the social context can be carried out, or the meaning of knowledge constituted about what to teach and by what means (Daniels, 2016). This confirms the importance of these questions being part of the preservice teacher's process. In this way, teachers will lead other teachers to integrate ICT in their practice, as the teacher cannot share experiences he/she does not have or point out ways that he/she has never experienced.

3. Methodology

Considering the "problem" of the research carried out - the theoretical and methodological gap with regard to the effective association between technologies and basic education -, we verified significant possibilities to fill it and, in fact, seek a leap in quality in the education of young students and education as a whole. With a view to achieving the research purpose, a continuing education course based on applied action-research was developed. Data collection involved theoretical and empirical scope, in the sense of investigating teachers' perceptions regarding the role of technologies in teaching in different areas, as well as degrees of involvement and resistance around technological competences in an educational perspective.

The participatory action-research started from a dense analysis of the context involved. The cycle foreseen predicted changes in teachers' practices within the scope of their joint and collaborative planning and future implementation within schools. After organizing the group of participants, the planning dimension took place involving elaboration and future implementation of digital learning objects. After that, a theoretical and methodological cycle started, holding eight training meetings carried out remotely with the participants and providing video tutorials recorded by the researchers on key concepts of the project. A portfolio was organized and displayed at the project's webpage (https://sites.google.com/unijui.edu.br/escolasinteligentes/p%C3%A1gina-inicial?authuser=0) and youtube channel (https://www.youtube.com/playlist?list=PLdDktqvuZA_aKO42Se40tEYei4ec_WDuc).

The research had 45 participants. They effectively participated in the course, which featured remote meetings held monthly between April and December 2022, always on the last Saturday of each month. The themes of the remote meetings were Cyberculture, Multimodality and Education, Practice and implementation of TPACK, Development of Computational Thinking in Basic Education, Experiences and possibilities involving Artificial Intelligence (AI) in basic education, Gamification and use of applications for mobile devices in basic education, and Blended teaching methodologies, based on team's and teachers' suggestions.

Among the 45 participants, 93% are female and the majority are between 30 and 50 years old. They are linked to the areas of Literature and languages, Physical Education, Literacy, History, Geography, Mathematics, Physics, Biology, and Chemistry. 50% have a *lato sensu* postgraduate degree, 25% a Master's degree and 11% a PhD. Others do not have postgraduate degrees.

In terms of data gathering, participants were asked to answer a questionnaire (adapted from Schmidt et al., 2009 apud Herring et al., 2016), which seeks to ascertain their self-perception regarding their TPACK before taking the course. Data analysis was developed with a five-point Likert scale to assess

participants' attitudes towards the use of technology in education, followed by a descriptive analysis to summarize and interpret data, identifying patterns and trends at this stage.

After the course, a qualitative dimension regarding participants' reports was conducted based on Discourse Textual Analysis (DTA) (Moraes and Galiazzi, 2020), and this is the dimension highlighted in this report. Specifically, the oral reports from the participants during the last meeting were recorded and transcripts were analyzed with the use of the qualitative software Atlas. ti. Considering DTA, the transcript was analyzed starting with the "fragmenting", or "unitarization" stage. In this phase, the text was examined in detail to be fragmented in meaning units. These were later interpreted and organized into a broader category, constituting the second DTA stage - the "categorization" process. Finally, the last stage, with the so-called "Metatext" was produced, i.e., the analytical textual production was carried out in which the categories were presented and interpreted from the perspective of the constructed theoretical framework, on a recurring basis: theory informs and is informed by the data and categories emerging from them, as it is presented in the following Results section.

4. Results and Discussion

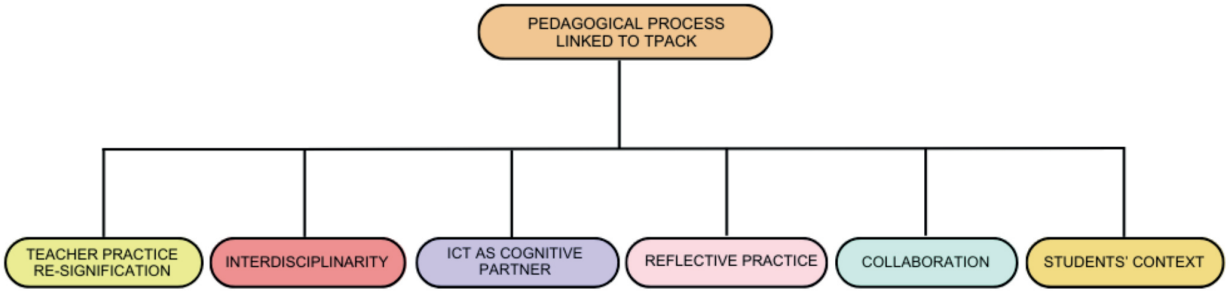
For the purpose of preliminary mapping about their view on educational technologies and self-perception involving technological pedagogical content knowledge (TPACK), the questionnaire proposed and validated by Schmidt et al. (2009) apud Herring et al. (2016) was adapted, and the 46 questions were "labeled" according to the grouping associated with a type of knowledge linked to TPACK.

In general terms, we observed that teachers had limited familiarity with educational technologies, often using them in isolation without holistic integration into their pedagogical practice. Teachers demonstrated a solid understanding of pedagogical strategies and underlying theories but faced challenges in assessing student performance and adapting teaching approaches to student needs.

Hence, before taking the course, participants recognized the interaction between technology and content in their pedagogical practices, but faced difficulties with thinking critically about the integration of technology in teaching and its impact on learning, with challenges in both preservice and effective inservice teaching practice. There were uncertainties involving elements regarding the habit, knowledge and technical skills for using ICT, as well as the approximation with technologies on the one hand; and on the other hand, greater confidence about solving technical problems. Gaps in their initial training regarding the pedagogical processes associated with the technological context, beyond the instrumental sphere of use, were clear in their opinion, suggesting that teachers perceive the lack of opportunity for reflection and critical thinking in their initial training.

However, after taking the course, experiences' reports showed significant changes in terms of participants' understanding and reflection-in-action regarding the role of ICT within their pedagogical practice. The analysis carried out on the transcripts of the recordings showed an interdisciplinary work on the part of the professors, who, through different didactic and technological resources, explored the themes discussed throughout the course, as Figure 2 illustrates.

Figure 2. *Main concepts from textual discourse analysis (DTA)*



Considering DTA, teachers' experience reports transcript was analyzed starting with the "fragmenting", or "unitarization" stage. In this phase, the text was examined and fragmented into 65 meaning units. These can be summarized as Figure 2 illustrates, regarding concepts that emerged from teachers' voices. These units were later interpreted and organized into an emergent category: "The continuing education course contributed to the re-signification of teaching practice and the role of ICT for pedagogical purposes".

In order to portray these dimensions, 4 excerpts are given in this results section. They are qualitatively representative of the 45 participants in the sense that the meaning units that make up this category related to how much the course challenged participants to effectively rethink the role of technologies in their lives and that of their students, as participating teachers' excerpts (named as P1, P2, P3, P4) illustrate.

From the work with cyberbully and corporeality, teacher P1 reported that students' engagement in "gamified" activities with unplugged computing simulations was much greater, enabling integration between theory and practice with students - with and without the presence of technologies. According to her:

> So …the first one that I developed for the sixth year, the theme was bullying in the life project I worked on and then first it was working, then the conversation through the titles of bullying ,,, the consequences … purpose of the law … videos we worked on … And then I presented these more theoretical questions I wanted to know about the subject and I integrared the physical education that I was working with them on the games … board games … so they created the games and they did it in parallel … Because of the two disciplines … I worked on the types of board games … how it was built and everything … history … and then they created a board game about bullying with constructions and questions, drawing scores of each game. For this, they used the material available …(...), there were times when I worked from technology to face-to-face and other face-to-face to technology so there I started from the discussion of it to later use it within the technological environment … so they used sheets … they created their own board games … and played between them… they created each one with their questions … And then they socialized with each other … they exchanged the games they created on the topic. (P1)

The cyberbully topic was developed by the teacher with other students involving specific technological tools, evidencing her conscious and integrative work of her content, pedagogical and technological knowledge. P1 effectively sought to develop not only activities with one or another digital resource, but integrated ones, transcending the instrumental focus as Jonassen (2007) and Kurtz and Silva (2018) observe, raising students' awareness about their technological knowledge for educational purposes (Zeng et al., 2022). Just like her, teachers argued having to adapt and develop different activities in different grades of elementary school. According to P1:

> So this was one of the activities carried out for the sixth year, another activity that I did during the year, also culminating in the Smart Schools project. It was the 8th year and the theme was then divided, so it was the use of technology for education, for one of their objectives… It was to learn about online game site applications, so that technology could also be used for knowledge because they have this access to technology much more or just for social networking, right, they don't have … sometimes they don't even know how to search for correct information, right … so the objective was more in that sense … life project and I was at the same time working with the Smart Schools project … and then the concepts of different developments … (P1)

Like P1, the participating teacher P2, who developed activities associating computational thinking and statistics through collaborative work, stated that the practical activity mediated by technologies was not only much more meaningful for students, but also fed the link between teacher and student and between students, considering their contextual needs. According to P2:

> The teacher's place within the process…that student in my point of view had a very significant speech….the other ways I worked with that student… I had no connection with him, and from the moment I involved him in a technological practical activity, he managed to express himself, he managed to say what he knew… (P2)

According to P2, it seems possible to perceive that the effective participation of the student was not possible through "traditional paths". According to her, the work gave the student a "voice", and through the continuing education course she was able to reflect on this process as a whole, considering Tardif (1991; 2010; 2013) and Schön (1992; 2000) theoretical assumptions on reflective teacher and teacher knowledge.

In addition, P3 expresses surprise with the course taken, deconstructing myths involving continuing education in the field of technology, in a metacognitive process of teacher reframing (Daniels, 2016; Ouyang et al., 2021; Popandopulo et al., 2021), i.e., a process in which teachers and students gradually become aware of the cognitive processes used in the act of teaching and learning. This conception reiterates Daniels' (2016) finding that most individuals have the capacity for reflection, which allows them to develop more original and enlightened ideas, as long as they are explicitly and intentionally mediated.

According to P3, the tools and applications explored in the course, in association with theoretical and epistemological reflections, made meaningful experiences possible for her and her students. According to P3,

> … then when I started to participate in this project I thought I started to rethink some things… Mainly in the sense that I could include the technology part within this project… We visited a sanitary landfill, a collection cooperative that also … make money with our garbage, with our waste that can be recycled in reality, just like this school in the students' homes … In this context of need to know the reality of the person who really does not have the conditions to live literally from the garbage that we don't use so it was really cool we had this visit and they assembled the material using the Canvas platform, google tools, PowerPoint as a tool that was the first moment where they used technology … I was thinking about the question, what do students know at school in terms of proper waste disposal? (...)

The scope of the project and training cycle was quite significant, as the excerpt from P3's speech illustrates. Environmental awareness was disseminated throughout the school and beyond, suggesting that technological mediation effectively enables a greater range of actions such as the one provoked by the teacher and her classes.

Another report that shows a significant change in understanding the role of technologies in the teaching and learning process is brought by P4, when she highlights the challenge to teachers and students regarding the creativity and reflection that can be introduced in pedagogical proposals mediated by technologies, such as reported by this teacher:

> The project exceeded my expectations and I believe of my colleagues as well because we had a space for reflection, systematization of doubts and support... There were several meetings outside our work shift and it was a learning moment and will also awaken in the teacher more and more the desire to continue working and to continue using these resources … And this will also awaken in the students this interest and this desire to learn in a different way and of course we will not limit only the use of technology with the electronic means but also the awakening to those ludic practical activities that are also technological tools that will improve the contact with the student and help to understand the themes that we have to present... to complement our work with new technologies bringing different activities...challenges for us and also for the students because just as we do not have mastery of a large part of the technologies that can be used in the classroom, the students are also unaware of it... challenge… I started to use a tool called Kahoot … and it was really cool … it was challenging even initially … I tested it at home with the family, right to learn not to embarrass myself, but it was really cool … It was very challenging at the beginning of this project …in the meetings we discovered that we have a group in common so we decided to think of an interdisciplinary activity and put this activity into practice…

Thus, P4's report illustrate results verified in continuing education regarding the significant change in understanding, on the part of the participating teachers, regarding the role, limitations and potential of ICT in the educational context. From mere tools to be used, they became cultural instruments created by man to "solve human problems", with changes brought about from different perspectives, some positive, others not so much.

According to this teacher report, and this was also shared by the participants, there is praise and recognition that the continuing education course was, in fact, a space for reflection, where tea-

chers were able to discuss their doubts and support each other, in an environment of collaboration and continuous learning between teachers. This space awakened a desire to dare and explore technological resources in their teaching practice, and, consequently, the interest and desire to learn differently in students. The diversity of activities, playfulness, games, and other issues based on the scope of the project made it possible to understand that innovation is possible regardless of the use of one technology or another, but is enhanced by an articulated use of these resources, especially in an interdisciplinary way, as recent literature has pointed out (García et al., 2020; Reyes-Cabrera, 2022; Martin-Párraga et al., 2022; Silva et al., 2024).

Thus, we realized that the methodology triggered from TPACK, through tools and applications, from the simplest to the most elaborate can effectively be implemented in schools, in deep conceptual association, as it is not enough to deal with new methodologies if the conceptual and epistemological basis of the teaching, research, teaching role and instruments or mediation means are not sufficiently clear.

Teacher knowledge (Tardif, 1991; 2010; 2013) thus became effectively meaningful and experiential for the participating teachers as they comprehended the knowledge they have and use in their daily pedagogical practice. By recognizing not only the importance of integrating technology into their practice but also actually experiencing study situations and methodological possibilities grounded in a strong epistemological framework, they demonstrated deep reflection regarding their teacher knowledge concerning the curriculum and experiential knowledge as originally proposed by Tardif in 1991.

5. Final considerations

In the realm of cloud computing, blended learning, and especially after the spread of programs based on generative Artificial Intelligence (AI), a field where machines are becoming increasingly proficient at creating content and simulating human-like behavior, it seems possible to state that concepts explored in this research should be integrated into undergraduate and teaching curricula, either into preservice and inservice teachers' programs. This is especially relevant because many educators, including those in Brazil, are still somewhat apart from critical and reflective practices regarding this digital and technological scenario.

Through research investigation and the completion of the continuing education program, it was collectively and collaboratively realized that ICT will no longer be underused in educational contexts due to teachers' fears or lack of knowledge. We have successfully bridged the gap between academia and the classroom, facilitating teachers' efforts in an educational landscape that is increasingly mediated and transformed by technology.

Certainly, we encountered challenges along the way, such as the drop-out rate among enrolled professors, which can be attributed to various factors like time constraints and health issues. Nonetheless, our experience with conducting a distance learning course with monthly synchronous meetings has been positive. This approach enabled participation from educators across various cities without the need for traveling, reducing the associated costs and inconveniences.

Furthermore, our collaborative efforts have resulted in mutual learning and strengthened partnerships, not only within the education sector but also in the broader academic community. We have been actively sharing our findings and insights nationally and internationally. This collaboration between researchers in education and computer science underscores the critical importance of interdisciplinary initiatives like ours.

Finally, in light of the Sustainable Development Goals (SDGs), it is evident that the initiatives undertaken and the strengthened partnerships mentioned play a pivotal role in striving for a more sustainable and equitable future. By integrating these global principles into our collaborative efforts, we are not only empowering educators and enhancing the quality of education but also actively contributing to the achievement of the SDGs, particularly those pertaining to quality education, sustainable development partnerships, and technological innovation.

Our next step follows the recent research conducted by Wang et al. (2023), focusing on mapping research to the SDGs, which aligns closely with the principles and objectives of the 2030 Agenda for Sustainable Development. Considering the authors' work, the University of Auckland's SDG Keywords Dictionary Project aims to enhance the identifica-

tion of SDG-relevant research using text-mining techniques applied to academic publications. This endeavor contributes to the broader mission of universities and institutions worldwide in measuring their impact on the SDGs, not only through research but also through teaching and community outreach. This collaborative approach exemplifies the spirit of the 2030 Agenda and reinforces the significance of academic endeavors in advancing sustainable development on a global scale.

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Cultures, policies and inclusive practices according to university students

Culturas, políticas y prácticas inclusivas según estudiantes universitarios

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Abstract

Diversity in university students is a reality that we cannot ignore, and it has constituted a topic of interest in recent years. This article intends to analyze the progress of inclusive education at university level from the students' perception according to three dimensions of inclusive education: creation of cultures, generation of policies and development of practices. In order to meet the objective, *the Index for inclusion adapted to higher education* was applied to 848 university students. Data was processed using descriptive statistics. The results indicate a significant appreciation of dimension A: Creating inclusive cultures (M = 2.00; SD = 0.39) in a very similar extent to dimension C: Development of inclusive practices (M = 1.97; SD = 0.48), while Dimension B: Developing inclusive policies, remains the most underestimated dimension (M = 1.84; DE = 0.43). The results show the response that is required from the university, aiming to generate mechanisms that guarantee access, permanence and completion of higher education, as well as the need to promote policies with an inclusive approach that responds to the diversity of university students.

Keywords: education, inclusive, practices, policies, cultures, diversity.

Resumen

A nivel del contexto universitario la diversidad estudiantil es una realidad que no podemos desconocer y que constituye un tema de interés en los últimos años. Este artículo pretende analizar el desarrollo de la educación inclusiva, a nivel universitario, desde la percepción del estudiantado en tres dimensiones: creación de culturas, generación de políticas y desarrollo de prácticas. Para cumplir el objetivo se aplicó el *Index for Inclusion adaptado a la educación superior*, a 848 estudiantes de la universidad. Los datos fueron procesados mediante estadísticos descriptivos. Los resultados indican una apreciación significativa de la dimensión A: Crear culturas inclusivas (M=2.00; DE=0.39) en una medida muy similar a la dimensión C: Desarrollo de prácticas inclusivas (M=1.97; DE=1.48), mientras que la dimensión B: Elaborar políticas inclusivas se queda como la dimensión más desestimada (M=1.84; DE=0.43). Los resultados evidencian la respuesta que se requiere desde la universidad, apuntando a generar mecanismos que permitan garantizar el acceso, la permanencia y la culminación de la educación superior, así como la necesidad de promover políticas con enfoque inclusivo que responda a la diversidad del estudiantado.

Palabras clave: educación, inclusiva, prácticas, políticas, culturas, diversidad.

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1. Introduction and state-of-the-art

There are more opportunities for accessing Higher Education (ES) since the processes of democratization and inclusion, guaranteeing the right that every citizen has. The purpose of achieving an education for all is based on the certainty that education contributes to eliminating inequalities caused by gender, income, disability status, ethnicity, religion, among others.

Although the literature has reviewed extensively the concepts of attention to diversity and educational inclusion, it is necessary to mention that diversity is an inherent characteristic of today's society, while inclusion is a principle that demands the ability to see diversity from respect for differences, requiring the participation of all people. Inclusion and diversity do not lie in thinking exclusively about individuals with particular characteristics, but in recognizing the other. It is a call to question, at a social and individual level, how we are understanding and interpreting the other (Montánchez et al., 2017).

For Langa and Lubián (2021), attention to diversity is part of the discourse of inclusion as characteristics that ensure quality education in the HE; in other words, Higher Education Institutions, recognizing their social responsibility, in addition to providing quality teaching and producing research, must "assume the social mandate of being a reference of values and human progress" (García et al., 2017 p. 5).

Attending to diversity in university classrooms is concomitant with the phenomenon of expansion of the HE. In 1970, 1 out of 10 people enrolled in university, while in 2017 they were 40 per cent of the relevant age cohort worldwide; however, despite the expansion of enrollment, there are still vertical and horizontal differences in HE (Salmi & D'Addio, 2020).

In Ecuador, thanks to the support of the regulations, there is an important advance in addressing diversity within universities. The Political Constitution of Ecuador (2008), in article 26:

> It recognizes education as a right of people throughout their lives and an inescapable and inexcusable duty of the state, which must be democratic, inclusive, diverse, of quality and warmth, and will promote equity, justice, solidarity and peace. (p. 17)

On the other hand, the 2030 Agenda establishes the Sustainable Development Goals in its objective 4.3 which states "by 2030 there must be equal access for all men and women to technical quality, vocational and higher education included in university education" (UNESCO, 2017, p. 40).

In this context, university policies should focus on strengthening capacities and finding solutions to social problems, maintaining the momentum of the first years that continued to the dissemination of the Organic Law of Higher Education (LOES, 2010), i.e. working to improve enrollment coverage, aimed at ensuring similar opportunities, promoting equal access through "scholarships, economic aid, quota policies or educational credits that seek to reduce educational inequalities" (Ramírez, 2012).

Salmi (2020) states that traditionally excluded groups have lower completion rates. These exclusionary processes can be caused based on gender, social class, socioeconomic status, cult, ethnicity, sexual orientation and disability status (Booth & Ainscow, 2015). Although these scenarios have been gradually changing in Ecuador and Latin America, there are still several pending issues. For Valenzuela and Yánez (2022), the opportunities to access the HE is not distributed equally; the effects of education are observed throughout life, access and the completion of HE, which contribute to reduce the inequalities generated.

Attending to diversity implies seeking and cementing social possibilities, it entails eliminating differences, which in moments involves divergences in university classrooms (Gil & Morales, 2019). An inclusive HE transforms its organization and functioning to address diversity by promoting changes in inclusive policies, practices and cultures, which promote the recognition of diversity through exchange, active and critical participation.

The recognition of a university that works for inclusion must lead to identify its commitment to society, building spaces where everyone's participation is recognized, discarding all kinds of exclusions, a university that pays attention to students who may be more exposed to marginalization, failure, and consequently exclusion (Barrio de la Puente, 2008; Fernández & Pérez, 2016; Gallegos, 2015).

Inclusive culture is understood as the act of establishing attitudes and values related to diversity as something respectable, which directs institutional decisions and actions (García, 2017). Booth and Ainscow (2002) argue that inclusive culture welcomes principles that are later concretized through the poli-

cies that an institution manages seeking to address diversity. Solla (2013) reaffirms this approach, indicating that inclusion involves the preparation of an institutional model based on diversity.

For Latin America, moving towards inclusive university systems continues to require strong political will from a social justice perspective that promotes the creation of educational and social policies that review the elements that generate exclusion (Blanco & Duk, 2019). Policies that constitute the framework in which the necessary contributions are established, to deploy practices that respond to diversity (Booth & Ainscow, 2002; Ferrer, 2019). The policies form the platform on which an educational model is sustained that is specified in the practices and helps to generate an inclusive culture.

Gibson (2015) argues that policies have driven inclusive education initiatives focusing on resource distribution. It questions arguments that suggest that adequate funding will enable the success of inclusive education as the only solution to existing problems. Education is, intrinsically, a political issue, therefore, it is an eminently political decision, which allows an improvement and advancement in inclusive education (Benet-Gil, 2020).

The development of inclusive practices involves making the necessary supports that enable all people to access spaces, relationships, resources and progress in educational activities. Talking about practices requires eliminating processes that involve discrimination, segregation and that hinder equal opportunities (Darretxe et al. 2021; García, 2017; De los Santos-Gelvasio, 2022). An example of this is the fact of promoting inclusive practices for the student population considered unequal, with the purpose of using an integrative approach that allows overcoming the challenges associated with the permanence of this population in the HE and offering the necessary accompaniment (Gross, 2014). In this way, an inclusive university embraces diversity, attending to the difference and recognizing the importance of teacher training in inclusion (González, 2016; Ruiz, 2019).

The approach to inclusive education is currently the most appropriate initiative to face exclusion, as it defends human rights and is based on the principle of equity, equality and social justice (Arnaiz & Guirao, 2015; Ruiz, 2019; Simón & Carballo, 2019; Solla, 2013). An inclusive university educates by respecting student rights, increases participation, seeks to reduce exclusion, creates a space of equity, guarantees equal opportunities for all, and restructures cultures, policies and practices (Hanne, 2017; Ferrer, 2019; Gil & Morales, 2019; Martínez, 2021). In this sense, the study proposes to know from the voice of the students of the University of Cuenca the appreciation of inclusive practices, cultures and policies, through the self-evaluation of the dimensions *of the Index for Inclusion*, with the purpose of having information on the presence of inclusive practices, values and policies that manifest themselves in the access, presence, collaboration, permanence and learning of the students (Arnaiz & Azorín, 2014; Booth & Ainscow, 2002; Echeita, 2013).

This work aims to know the current state of the formation of cultures, creation of policies and development of inclusive practices managed by University of Cuenca, from the view of students and teachers and with the aim of developing concrete actions to support the change towards the improvement of inclusive orientation practices in the HE.

2. Methodology

2.1 Focus and design

This research used a quantitative approach, with cross-sectional design and descriptive scope that allowed to characterize cultures, policies and inclusive practices based on the perception of the students at the University of Cuenca.

2.2 Participants

The study population was composed by the students at the University of Cuenca; the sample was stratified and calculated with a confidence level of 95% and a margin of error of 3%; it was composed of 848 students from the different faculties of the University under study. 60% self-identified as female, 38.8% as male gender and 0.7% as others. The ages ranged from 17 to 40 old (M = 21.2; 2.7); most were mestizos (86.8%), 71.6% were from the city of Cuenca and 28.4% from another city in Ecuador, 2% claimed to have a disability.

2.3 Instrument

The instrument used for information collection was the *Index for Inclusion* adapted to Higher Education, which comes from the original instrument proposed by Booth and Ainscow (2002). At the university level, the adaptation made by Salceda and Ibáñez (2015), encourages teachers and members of a university community to assess the real possibilities to increase learning and the partition of all students.

This guide assesses how inclusive an institution is through three dimensions: inclusive cultures, policies, and practices (each subdivided into two sections). The instrument is composed of 48 items and exhibits four response options, all three belonging to a scale (1= disagree, 2= quite agree, 3=totally agree). Option 4 determines whether more information is needed to answer the questionnaire.

Table 1. *Dimensions and sections of the Index for Inclusion adapted to Higher Education*

Dimensions	Sections	N° Items
A: Creating inclusive cultures	A.1. Building community	11
	A.2. Set inclusive values	8
B: Developing inclusive policies	B.1. Developing a university for all people	8
	B. 2. Organizing support to address diversity	7
C: Developing inclusive practices	C.1. Managing the educational process	8
	C.2. Mobilize resources	6
	Total	48 items

2.4 Procedure

The survey was applied between May and July 2019, after receiving the respective authorizations. For applying the instrument, the pollsters went to each of the faculties requesting the collaboration of the students, after having signed the consents, they proceeded to fill the items. It should be noted that the University of Cuenca, has a committee of Bioethics - COBIAS, a body that approved the study and guaranteed the observance of ethical principles.

2.5 Data analysis

To process the results obtained, the SPSS software version 25 was used through a descriptive analysis, in which the distribution frequency for the three dimensions and sections is observed. Data analysis was developed using measures of central tendency and dispersion.

3. Results

The results obtained are described considering the same dimensions that the *Index* contemplates *for inclusion, namely:* creation of cultures, development of policies and development of inclusive practices.

In general, there is a *regular* level of performance; dimension A presents a predominance in a measure very similar to dimension C, being Dimension B which presents a less favorable perception. It is also evident that the most deficient characteristics of each section correspond: in dimension A, section A.2. 'establish inclusive values'; in dimension B the lowest section corresponded to B.2. 'organize support to address diversity' and dimension C, in section C.2. 'resource mobilization'.

The students consider the university as a welcoming institution, a space where learning and participation opportunities are provided; however, it is necessary to establish values, and implement actions that seek to reduce discriminatory practices or reduce the barriers to learning that are still maintained in the university context.

Similarly, it is perceived that inclusive practices help to build learning, adapting content to attention to diversity and organizing groups that support inclusion, however, the data reveal that students are unaware of the resources of the faculty, therefore, these are not used or distributed fairly to support inclusion.

The least favorable assessment is oriented to the elaboration of policies, which according to the perception of the student is the least scored. The elements referred to deploy a university for all and the organization of supports to recognize diversity are still pending policies for the university. In addition, gaps are perceived in the training, the development of research and the socialization of these actions so that students feel recognized and cared for in their diversity.

Table 2. *General perception of the dimensions and sections evaluated*

Dimensions and sections	Average	SD
A.	2.00	0.39
A.1.	2.04	0.39
A.2.	1.95	0.46
B.	*1.84*	*0.43*
B.1.	1.87	0.46
B.2	1.80	0.48
C.	**1.97**	**0.46**
C.1.	1.99	0.48
C.2.	1.94	0.51

The analysis for each of the dimensions will be presented to detail the results.

Dimension A presents two sections related to the organization of an inclusive, equitable and quality space (Table 3). In the first section A.1, the highest rated indicator, corresponded to A.1.11. 'The entire university community is proud to belong to this university', while the weakest, A.1.1. 'Everyone feels welcomed'. It can be noted that although students feel proud of belonging to the university, they manifest not feeling completely welcomed in the university space, since they presented lower scores with indicators that focus on the fact of identifying with the philosophy and principles of inclusive education, as well as the promotion of actions linked to solidarity and cooperation. As for section A.2, the least evaluated items are the A.2.4 and A.2.5. referring to the actions carried out by the faculties to implement actions that reduce discriminatory practices, as well as the efforts to prevent social risks; however, they perceive that their teachers have high expectations of the student, a situation that improves their participation and learning.

Table 3. *Perception of Dimension A and its respective sections*

Items: A.1.	Rate of answers		M	SD	Items: A.2.	Rate of answers		M	SD
	n	%				n	%		
1.1.	814	96.0	1.79	0.66	A.2.1	806	95.0	1.96	0.65
1.2.	815	96.1	1.99	0.59	**2.2.**	826	97.4	2.14	0.64
1.3.	765	90.2	1.88	0.65	2.3.	812	95.8	2.03	0.66
A.1.4	798	94.1	1.79	0.69	2.4.	752	88.7	1.77	0.7
1.5.	831	98.0	2.20	0.61	2.5.	743	87.6	1.80	0.69
A.1.6	797	94.0	2.02	0.67	A.2.6	815	96.1	2.01	0.65
A.1.7	816	96.2	1.99	0.7	**2.7.**	818	96.5	1.97	0.71

Items: A.1.	Rate of answers		M	SD	Items: A.2.	Rate of answers		M	SD
	n	%				n	%		
1.8.	829	97.8	**2.34**	**0.63**	A.2.8	806	95.0	1.90	0.67
1.9.	804	94.8	2.14	0.69					
1.10.	818	96.5	1.91	0.68					
A.1.11.	834	98.3	**2.39**	**0.68**					

Note. Taken from Clavijo and Bautista (2022).

In Dimension B (Table 4), measured through two sections: 'Build community' and 'Set inclusive values', there was a less favorable perception than the others. The results reflect that the strengths are linked to item B. 1.2. 'the faculty is accessible to all people' and in item B. 1.4. 'the student entering the faculty receives the attention that guarantees their preparation for life and the world of work'; while the weakest indicator corresponded to B. 1.8. 'When the student accesses the faculty for the first time, it helps him to adapt'. In this case, although the perception indicates that the university guarantees accessibility and training for all students, there is a need for induction processes that allow new students to adapt to the university as well as to supervise that the complementary services offered in each faculty are socialized so that they can benefit from them.

Section B.2 presents the lowest assessment. We found scores below the midpoint of the scale (M=2) in all items except indicator B.2.2. 'Research and teacher training in topics related to inclusive education is promoted'. A striking result refers to the response percentage of the total of indicators, in most of the cases, approximately 12% of participants did not answer these items. Considering that this section presents a less favorable perception, we consider that it is identified as the main point for the decision-making and improvement. If the university aims to develop inclusive education, it should support these indicators for inclusive policies, research, teacher training, student support and evaluation.

Table 4. *Perception of Dimension B and its respective sections*

Items B.1.	Rate of answers		M	SD	*Items B.2.*	Rate of answers		M	SD
	n	%				n	%		
B.1.1	783	92.3	1.90	0.69	B.2.1	738	87.0	2.00	0.61
B.1.2.	**822**	**96.9**	**2.05**	**0.75**	2.2.	748	88.2	2.01	0.68
B.1.3.	743	87.6	1.86	0.67	B.2.3.	762	89.9	1.78	0.69
B.1.4.	**823**	**97.1**	**2.00**	**0.69**	B.2.4.	785	92.6	1.86	0.68
B.1.5.	820	96.7	1.74	0.72	B.2.5	703	82.9	1.89	0.67
*B.1.*6.	747	88.1	1.82	0.67	B.2.6	740	87.3	1.61	0.69
B.1.7.	699	82.4	1.96	0.60	*B.2.7*	*729*	*86.0*	*1.54*	*0.67*
B.1.8.	*802*	*94.6*	*1.66*	*0.71*					

Note. Taken from Clavijo and Bautista (2022).

Dimension C (Table 5), corresponds to the promotion of inclusive practices, participation and learning of all students in the curricular and extracurricular tasks. There are two sections to evaluate this dimension: each contains indicators focused on the formation of groups, spaces and times that consider diversity, generation and use of resources, and accompanying processes.

The results indicate a more favorable appreciation, with a response rate above 85%. Thus, from

the perception of the students, considering that the university supports the participation of all, item C. 1.5 'Students are actively involved in their own learning' stands out, which presents the highest estimate of this section. It is inferred that the teaching work is produced in collaboration with the students, who are actively involved in their learning processes.

The weakest perception refers to indicator C.1.3, referring to the 'organization of learning groups so that everyone feels valued'. This perception shows that students consider it important to work and learn on the basis of organizing groups within the classroom. In addition, these results recognize the utility and effectiveness of the supports, spaces and contents in which the inclusive practice of the university is developed.

In the second section, item C.2.4, 'Teacher experience is fully used to enrich the educational process', showing that the teacher experience is recognized as an essential mechanism to move towards inclusive education processes. On the other hand, the perception on indicator C.2.2 'Faculty resources are distributed fairly to support inclusion' was the most notorious weakness, data that may be due to the lack of knowledge of the student on the use of resources to respond to diversity in each faculty.

Table 5. *Perception of Dimension C and its respective sections*

Items Section C.1.	Rate of answers		M	SD	Section C.2.	Rate of answers			
	n	%				n	%	M	SD
1.1.	815	96.1	2.04	0.65	2.1.	754	88.9	1.93	0.67
1.2.	812	95.8	1.98	0.65	*2.2.*	*743*	*87.6*	*1.79*	*0.70*
C.1.3	808	95.3	1.87	0.70	2.3.	731	86.2	1.90	0.64
C.1.4.	792	93.4	1.93	0.65	**2.4.**	**806**	**95.0**	**2.07**	**0.65**
1.5.	**822**	**96.9**	**2.14**	**0.61**	2.5.	810	95.5	2.02	0.65
C.1.6	830	97.9	2.07	0.65	2.6.	790	93.2	1.99	0.68
1.7.	775	91.4	2.03	0.69					
1.8.	813	95.9	1.90	0.71					

Note. Taken from Clavijo and Bautista (2022).

4. Discussion

The aim of this research was to analyze the dimensions of the Index from the perception of the students at the University of Cuenca, finding differences between sections and indicators, both in the rate of responses and in the evaluation of each item.

4.1 Discussion of culture

Regarding the dimensions included in the *Index*, the study revealed a greater perception in dimension A; in general, the students perceive their faculties as spaces that reflect the foundation of a community and, above all, the fact of establishing inclusive values that allow the university to move towards inclusion.

The data allow establishing that students recognize the university culture, a situation that reflects in the indicators that point to the positive interrelations presented between teachers and students. It coincides with Ferrer (2019), who characterizes an inclusive culture as a space that is strengthened through participation and the creation of links between members, through the development of actions by teachers that address diversity, avoiding exclusion and lowering barriers to learning.

In this dimension, the best valued indicator focuses on the pride felt by the 'entire university community of belonging to this institution', an item that relates to membership, i.e. students and faculty

learn together and are part of the university. In this line, Ferrer (2019) argues that the relations between teachers and students constitute a main variable of inclusion that it is favored when the two members develop a sense of belonging to the institution.

Ocampo (2014) indicates that one of the fundamental elements by which students identify with their university is that the HEs in 21st century seek conditions that allow them to be a timely, inclusive and equitable institution, generating a sense of belonging and identification with it. Currently, the model of educational inclusion based on education for all demonstrates a greater degree of acceptance not only by students but by multiple social and political sectors that feel identified with social responsibility and the vision of the university subject of this research.

Generally, the notion of inclusive education encompasses participation, presence and learning. Speaking of presence is to refer to the place where the student is educated with warmth and quality (Darretxe et al., 2021; Ferrer, 2019). University students who feel identified with the institution will contribute to the construction of policies and practices to reach an inclusive culture. For Ocampo (2014), being part of the university involves defending constructs of diversity, differences and heterogeneity.

According to the authors cited, to ensure quality learning and guarantee that students feel welcomed by the institution, each faculty must be flexible in their curricular designs, as must stimulate training spaces, where students are recognized for their human and symbolic value (Benet-Gil, 2020; Ferrer, 2019; Ocampo, 2014). Starting from this recognition could improve the perception in relation to feeling identified with the institution, since the student requires not only that the admission systems to the HE be democratized, but that once inside, they can benefit from inclusive values that have been established by the institution.

4.2 Discussion on the results of inclusive policies

On the one hand, the fact that the institution is accessible and constitutes a space that guarantees the training of students is positively valued, while the formation of supports to respond to diversity is negatively appreciated. It is striking that actions are perceived to a lesser extent to identify situations of abuse of power or *bullying*, as well as teaching alternatives and differentiated tutoring. In practice, regulation is necessary to reduce exclusion processes. In this sense, Terigi (2014) argues that it is difficult to turn regulations into educational policies that make the law a reality. In other words, it is not enough to be an accessible institution; inclusive educational policies also imply understanding, experiencing and embodying in the regulations the complexity of the educational process.

Bartolomé et al. (2021) on educational inclusion indicate that although it is true that the university tries to guarantee education, making it inclusive requires an innovation of the educational policies of all HEs. Inclusion does not only imply promoting strategies that increase the participation of excluded groups that have fewer opportunities, it is also about promoting laws and regulations that guarantee and lead to inclusive universities (Benet-Gil, 2020; Ferrer, 2019). Education systems through the creation, approval and monitoring of legislation and regulations are the ones that are called to embody authentic inclusive processes.

Inclusive policies will define the bases of how the inclusive education process should be carried out, in some ways they are a key element since it empowers the review and supervision bodies of the higher education system by providing them with evaluation tools that regulate the level of compliance and quality of their inclusive policies (Bartolomé et al., 2021).

4.3 Discussion of practice

Bearing in mind that the objective of inclusion is to face exclusion and social fractionation, universities need to build and promote not only policies, but inclusive practices in all their spaces.

The results of this dimension show that students positively perceive the organization of the training processes, in particular those practices that favor the participation and support of teachers in learning. The inclusive practices developed in the university are focused on reducing barriers to participation and learning, management that comes directly from the action of teachers. In this regard, Vélez (2013) points out that the educational implications perceived as positive are related to the appreciation of diversity as a human category, therefore, educational inclusion presumes a social change in

relation to how legislation is perceived, but above all in the inclusive practices developed by teachers.

Ferrer (2019) emphasizes a series of criteria to select good practices that promote an inclusive culture, criteria linked not only to the students but to the educational community as a whole. Promoting autonomy, skills to reduce exclusion and discrimination, as well as strengthening the community through the creation of links between its members will be elements that strengthen the participation and learning of all. In this regard, the Hanne study (2017) highlights that, from the perception of students, it is necessary to promote policies and actions that are adapted to contextual realities, that consider the diversity of the students and are transversal in the different university services.

Faced with the lower perception, related to the fair distribution of resources available to the faculty to support inclusion, Ferrer (2019) argues that resources are required for creating barrier-free environments, which guarantee the access of new students, participation in school and extracurricular activities, and finally teachers trained in competencies to respond to diversity. Likewise, Vélez (2013) argues that as teachers are key pieces in the path of inclusive education, resources are required to enable their training and preparation, since the trained teacher depends on the attention and response to diversity. The fact that teachers present a series of training needs to respond adequately to diversity make them perceive as inadequate their intervention, coinciding in this case with the perception presented by the students in this research.

Walking towards educational inclusion implies not only knowing the legislation related to the attention to diversity, but training to attend to it, a premise that requires a mandatory permanent update, teaching experience and generation of resources (Vélez, 2013; Azorín, 2017). This is also highlighted by Gallegos (2011), referring to the allocation of resources for training in inclusive education, especially in the first years of the career, where a greater number of students are identified with this need, and we must guarantee their permanence. Likewise, De los Santos-Gelvasio (2022) highlights the need for contextualized training and an adequate follow-up to the attention to diversity, with the objective of developing diverse strategies that are articulated to the environment and deepen knowledge while attending to the needs of the students. Ocampo (2014) points out that besides the resources of a HE, what matters is the establishment of spaces for collaboration and training among peers, that would allow more timely relationships that improve learning.

Practices that enable students to learn together occur because the university is open to diversity and this constitutes a main variable of inclusion (Ferrer, 2019). In this sense, Azorín (2017) argues that the voice of students currently becomes an interesting line of research, not only to know their perception about attention to differences, but to generate information that makes it possible to incorporate the demands of students in the inter-learning process.

Students are one of the main agents of the educational process, therefore, it is advisable to consider the recommendation of Azorín (2017), who justifies the willingness of investigating inclusion from the perspective of all those who make up the university community, for this author to attend the diversity of the students is not only the responsibility of the teachers.

5. Conclusions

With the aim of analyzing the progress of inclusive education at the university level from the view of the students in the three dimensions contemplated by the Index for inclusion, we can note some conclusions.

The mention of equality of opportunities and equality that is expected is concrete in the generation of inclusive policies, which universities must embody in legal and regulatory frameworks that express actions aimed at equality of opportunities in an effective and real way, that favor access and continuity of a chosen career. Values that guide inclusive practices and policies should be evaluated and thought through to test whether the higher education context addresses diversity.

In this study these dimensions have been evaluated from the student's appreciation, who show the need to improve admission policies, allocation of resources, support to the diverse population, i.e. to have effective policies to ensure an inclusive HE.

Knowing policies, inclusive culture, but above all valuing inclusive practices as institutional strategies and classroom context that constitute supports to organize learning, become an important facilitator on the road to an inclusive university, as it allows to review practices, rethink classroom plans, reconsider

the classroom as a collaborative space where students, teachers, administrators, authorities participate.

On the other hand, valuing inclusive policies from the voice of the students makes it possible to know the guidelines of the university to respond to diversity. These policies are constituted in the framework that protects and endorses educational practices and also allows to generate an inclusive culture, characterized by environments in which all students feel welcomed and accepted with respect for their differences.

From the data obtained from the appreciation of the participants, we consider that although there are inclusive policies at the country level and within each university, supported not only in the regulations created to support the development of inclusive systems, we believe that socialization processes are necessary, as well as the development of practices that cover the plurality of the population, social inequality and support to students with disabilities.

Evaluating the dimensions considered in the Index for Inclusion allowed us to know the status in which the University of Cuenca is located regarding the attention to diversity, which entails a first step to undertake improvements and changes towards inclusive education. Advancing in inclusive education is moving towards a more equitable university and aware of the value of diversity; a higher education that considers inclusion as a principle that allows it to grow and enhance diversity and that not only reduces it to an exercise in rhetoric.

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Intentionality of early school dropout. A study on identity linkage

Intencionalidad de abandono escolar temprano. Un estudio sobre la vinculación de la identidad

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Abstract

The early school dropout rate in Spain stands at 13.6 %, a percentage higher than the European average. This is a phenomenon influenced by multifactorial aspects, including factors related to the educational system as well as individual characteristics. The objective of this research is to determine the influence of factors related to individual identity on early school dropout, such as gender, age, country of origin, mother tongue, and place of residence. The study is conducted through the administration of a specifically developed questionnaire to a sample of 1157 students from La Rioja in the final years of compulsory secondary education. Data analysis is performed through descriptive analysis, examining percentage differences between groups and represented with line graphs. The results show differences based on age, gender, and place of residence. Additionally, differences are observed between national and foreign students, especially those with a non-Spanish mother tongue. The main findings indicate that certain identity traits substantially influence whether students continue their educational process. Therefore, educational institutions should be aware of these potentially risky identity aspects in order to develop proactive actions for at-risk students, thereby avoiding future early school dropout.

Keywords: early school dropout, identity aspects, school dropout, school failure, truancy, compulsory secondary education.

Resumen

La tasa de abandono escolar temprano se sitúa en España en el 13,6 %, porcentaje mayor que el de la media europea. Se trata de un fenómeno en el que influyen aspectos de carácter multifactorial, entre los que se encuentran aspectos relativos al sistema educativo, pero también a otras cuestiones propias individuo. El objetivo de esta investigación es determinar la influencia de los factores relacionados con la identidad del individuo sobre el abandono escolar temprano, como género, edad, país de origen, lengua materna y lugar de residencia. El estudio se realiza mediante la aplicación de un cuestionario desarrollado ad hoc en una muestra de 1157 alumnos y alumnas riojanos de los últimos cursos de educación secundaria obligatoria. El análisis de datos se efectúa a través de un análisis descriptivo en los que se hallan las diferencias porcentuales entre grupos y se representa con gráficos de líneas. Los resultados muestran diferencias según la edad, el género, el lugar de residencia. Además, también se aprecian diferencias entre al alumnado nacional y extranjero, especialmente con lengua materna no española. Los principales hallazgos apuntan que algunos rasgos identitarios influyen sustancialmente en que cierto alumnado continúe su proceso formativo. Por ello, las instituciones educativas deben ser conocedoras de dichos aspectos identitarios potencialmente peligrosos, para poder desarrollar acciones profilácticas dirigidas al alumnado en riesgo y así evitar un futuro abandono escolar temprano.

Palabras clave: abandono escolar temprano, aspectos identitarios, deserción escolar, fracaso escolar, absentismo escolar, educación secundaria obligatoria.

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1. Introduction

The Early School Dropout Rate is defined as the percentage of individuals aged 18–24 who have not completed second-stage secondary education and have not participated in any form of training in the past four weeks (Instituto Nacional de Estadística, 2023). Despite the fact that the reduction of this rate is one of the main objectives of structural reform programs in Europe, specifically in Spain, it remains a highly relevant educational and social problem. Thus, although there has been a slight decrease in the last year, the national rate remains above the European Union average with an overall tally of 13.6% (15.8% men and 11.3% women), compared to 11.8% in the EU (Ministerio de Educación and Formación Profesional, 2024).

The concern for this phenomenon is justified by the number of studies that warn about the serious consequences of Early School Dropout, both for the person who does not complete his formative process, and for the overall development of society. Thus, this situation seems to significantly increase the risk of lack of employability, increase job instability, decrease income and increase rates of part-time recruitment, all factors that increase the risk of poverty and social exclusion (European Education and Culture Executive Agency, 2019). Specifically, in 2021, the employment rate of people between 20 and 64 years who had completed higher education was 84.8%, a much higher percentage than those who had only compulsory studies. Regarding physical and mental health, Gumà et al. (2019) appreciate a positive relationship between education level and healthy preventive care, in addition to better monitoring of chronic pathologies and more appropriate pharmacological use. On the contrary, people with low levels of education have reduced life expectancy, increased incidence of chronic diseases, increased consumption of toxic substances, increased incidence of eating disorders or a greater likelihood of anxiety and depression (Organización Mundial de la Salud, 2021).

The most recent studies on the phenomenon of early school leaving indicate that certain aspects of student identity exert a significant influence on this problem. Within these variables, gender has been identified as one of the most relevant factors. According to data from the National Institute of Statistics (Spain), 16.5% of men drop out of school prematurely, compared to 11.2% of women (Ministerio de Educación and Formación Profesional, 2023). In addition, boys account for 60% of repeat students, while girls tend to score higher and pass more successfully (Cerdà et al., 2020; Ministerio de Educación and Formación Profesional, 2023). This phenomenon has aroused considerable interest among researchers in the field of educational sciences, who explore the relationships between genders and school experience, considering the differences in the construction of subjectivity between girls and boys. These differences are linked to socio-labor models and stereotypes of femininity and masculinity, which often result from differential gender socialization (Fernández-Mellizo & Martínez-García, 2017; Suberviola, 2020). In addition, a difference in attitude towards school between both genders has been observed (Sáinz et al., 2021; Salas-Rodríguez, 2022).

Another of the identitarian variables of influence in school dropout is age. Authors such as Rizo and Hernández (2019), Constante-Amores et al. (2021) and Suberviola et al. (2024) affirm that students with a lag between chronological age and the school year, who must face the decision to continue with studies after compulsory education, are at greater risk of dropping the educational system than students enrolled in the corresponding academic year. However, with respect to this variable, a biased analysis would be carried out if the characteristic "repeating students" were not taken into account, since one of the phenomena that best predicts early school dropout is the non-promotion in some school year (Cerdà et al., 2020). In this context, the Organic Law of Modification of the Organic Law of Education (LOMLOE) of 2020 highlights as one of the main challenges of our education system the reduction of the high percentage of students who repeat a course, which contributes to the increase of early school dropout. LOMLOE emphasizes the urgent need to avoid repetition as a strategy to address learning difficulties.

Another identifying factor influencing early school dropout is the country of origin. According to data from the Ministry of Education and Vocational Training (2023), there is a marked educational difference between national and foreign students. The data show that foreign students are twice as likely

to drop out of school compared to their Spanish counterparts, and 50% less likely to access university education. Specifically, 29% of foreign-born young people drop out of school without completing secondary education. In addition, while 46.7% of Spaniards over the age of 25 have higher education, this percentage drops to 31.2% among those born outside the country.

In this regard, a study conducted by Carrasco et al. (2020) indicates that in Spain 75% of young foreigners aspire to obtain a higher degree. However, one in three of these young people drop out of school prematurely before starting post-compulsory studies. The research places as one of the main causes of this abandonment the low confidence they perceive on the part of the teachers. However, it would be imprecise to carry out an analysis of the factors that influence dropout rates without taking into account the "mother language" factor. In this sense, Hernández-Prados and Alcaraz (2018) carried out an exhaustive literature review on studies developed with respect to the incidence factors of premature school dropout, finding that language appeared as a handicap in 7.3% of them. In this regard, the studies developed by González-Rodríguez et al. (2019) and Rizo and Hernández (2019) show how foreign students with non-Spanish mother tongue have a higher risk of abandonment prematurely, in many cases, without completing compulsory secondary studies.

In addition to the above variables, in the analysis of the identity factors of the students it is important to consider the "place of residence" as an important factor of incidence. In this sense, a study developed by Santamaría (2020) shows that students residing in densely populated populations abandoned 16.6%, when they live in areas with intermediate density, the percentage rises to 19%, being in areas with low density where there is more school dropout, with rates of 20.6%. Taking these figures, the geographical factor could be determined as a variable of incidence, considering that, in turn, this aspect is mediated by other contextual factors such as the socioeconomic and cultural level of the family and the ease of access to the study center (Erira &Yarce, 2021).

Based on the analysis of the literature on ¿ school dropout and its link with certain traits of the identity of the individual, this study poses the main research question "What is the influence of certain identity traits of students on the intentionality of dropout?". From this question, the main objective of this study is to *analyze the influence of factors linked to the identity of students on the intention of early school* dropout, an objective in which the following work hypotheses are questioned.

Table 1. *Research Hypothesis*

H.1	Masculine students are more likely to drop out of school.
H.2	Older students show a greater intention to drop out of school before attaining a post-compulsory degree.
H.3	Foreign students say they are more likely to drop out of school.
H.4	Students with a non-Spanish mother tongue are at higher risk of early school dropout.
H.5	Students living in rural areas score more on the intention to drop out of school.

2. Method

2.1 Population and sample

The study population of this research is constituted by 6131 students of the Autonomous Community of La Rioja (Spain), distributed in 46 centers, both public and private, in which the last courses of the compulsory stage and first course of the non-compulsory stage are taught.

The students invited to participate were informed about the purpose of the study and asked to respond sincerely, since the collection and subsequent processing of data would be completely anonymous. It should be noted that the ethics committee of the university issued a favorable opinion to this investigation. In fact, the whole process was developed under the ethical code proposed by the Committee on Publications Ethics and by Estalella (2022), typical of socio-educational research with underage population. Finally, the participating sample was constituted by 1157 students belonging to 17 educational centers. With a margin of error of 1.6% and a confidence

level of 95%, this sample is considered acceptable in socio-educational studies (Herba & Rocha, 2018).

Data collection was carried out online in spring 2021. The contact with the centers was made through the General Directorate of Educational Innovation of the Government of La Rioja, who was in charge of the dissemination of the questionnaire in the schools supported with public funds through the RACIMA platform. Therefore, the sample obtained was managed by the will of the management teams, teachers and students, so it is not a probabilistic sampling, but the questionnaire was addressed to all the individuals that make up the universe and where the sample number was obtained *de facto*. Since the characteristics of the non-participants do not differ from the participants, this is a random sample.

Table 2. *Sample characteristics and percentages*

Gender												
Masculine		**Femenine**		**Other**								
569	49.18%	557	48.14%	31	2.68%							
Age												
14 years		**15 years**		**16 years**		**17 years**		**18 years**		**>18 years**		
25	2.16%	355	30.6 %	457	39.5%	193	16.6%	72	6.22%	55	4.75%	
Place of residence												
Small town		**Large village**		**City**								
252	21.78%	349	30.18 %	556	48.06 %							
Country of origin												
Spain		**Morocco**		**Pakistan**		**Romania**		**China**		**Other**		
950	82.1%	50	4.32%	23	1.99%	23	1.99%	11	0.95%	100	8.64%	
Mother tongue												
Spanish		**Arabic**		**African**		**French**		**German**		**English**		**Other**
1005	86.6%	59	5.1%	9	0.78%	5	0,43 %	2	0,17 %	1	0,09 %	74	6.4%

3.2 Instrument

After an exhaustive literature review focused on the main causes associated with the identity of students that influence early school leaving, an *ad hoc* questionnaire was designed. This questionnaire included variables related to this dimension, as well as items exploring the intention to leave the studies. The validation of the content of the questionnaire was carried out in a systematic and contrasted way using the Delphi method, according to the proposal of López-Vidal and Calvo (2019). This method involves a sequence of three phases (preliminary, exploratory and final) performed by a coordinating group and a group of experts. In addition, a pilot test of the questionnaire was conducted on a sample that represented the characteristics of our study population. During this validation process, some items were removed and/or modified to improve their wording and clarity.

Table 3. *Description of items in relation to study variables*

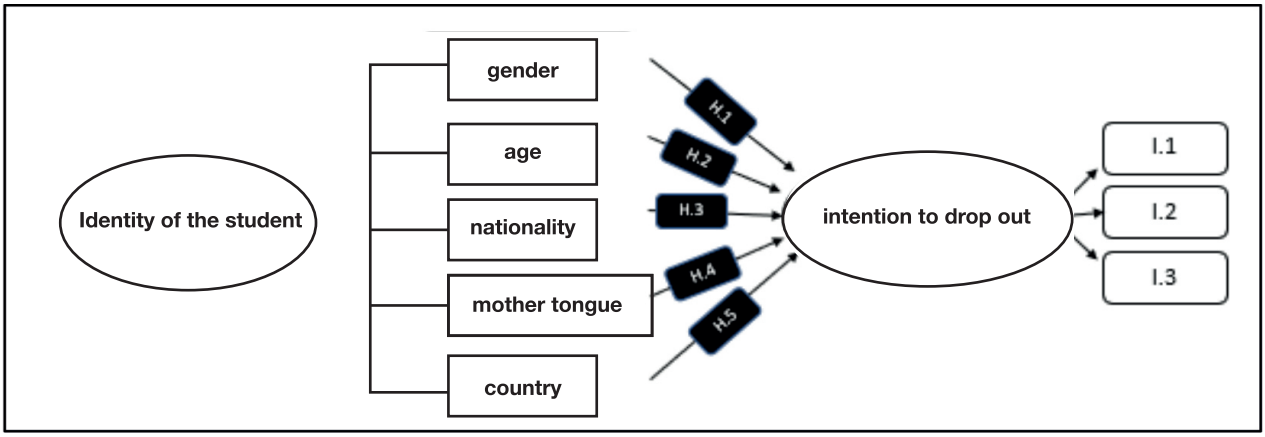
Variables linked to student´s identity			
Gender	Masculine	Mother tongue	Spanish
	Femenine		English
	Other		French
Age	14 years		German
	15 years		An Arabic language
	16 years		An African language
	17 years		Other
	18 years	Country of Origin	Spain
	>18 years		Romania
Place of residence	A small town		Morocco
	A big town		Pakistan
	A city		China
			Other
Intention of early school leaving			
Intention to continue studying after that course		Likert scale (1=sure not, 5=sure yes)	
Continue to study until obtaining a degree		Likert scale (1=sure not, 5=sure yes)	
Stop studying as soon as you can		Likert scale (1=sure not, 5=sure yes)	

2.3 Data analysis

Once the data were collected, a descriptive analysis was carried out that shows the distribution of the answers given to the items on the intention to drop out, differentiating between the different groups and representing it graphically.

After the verification of the psychometric requirements of validity and reliability, the structural model was created in order to test the hypotheses raised.

Figure 1. *Research Analysis Model*

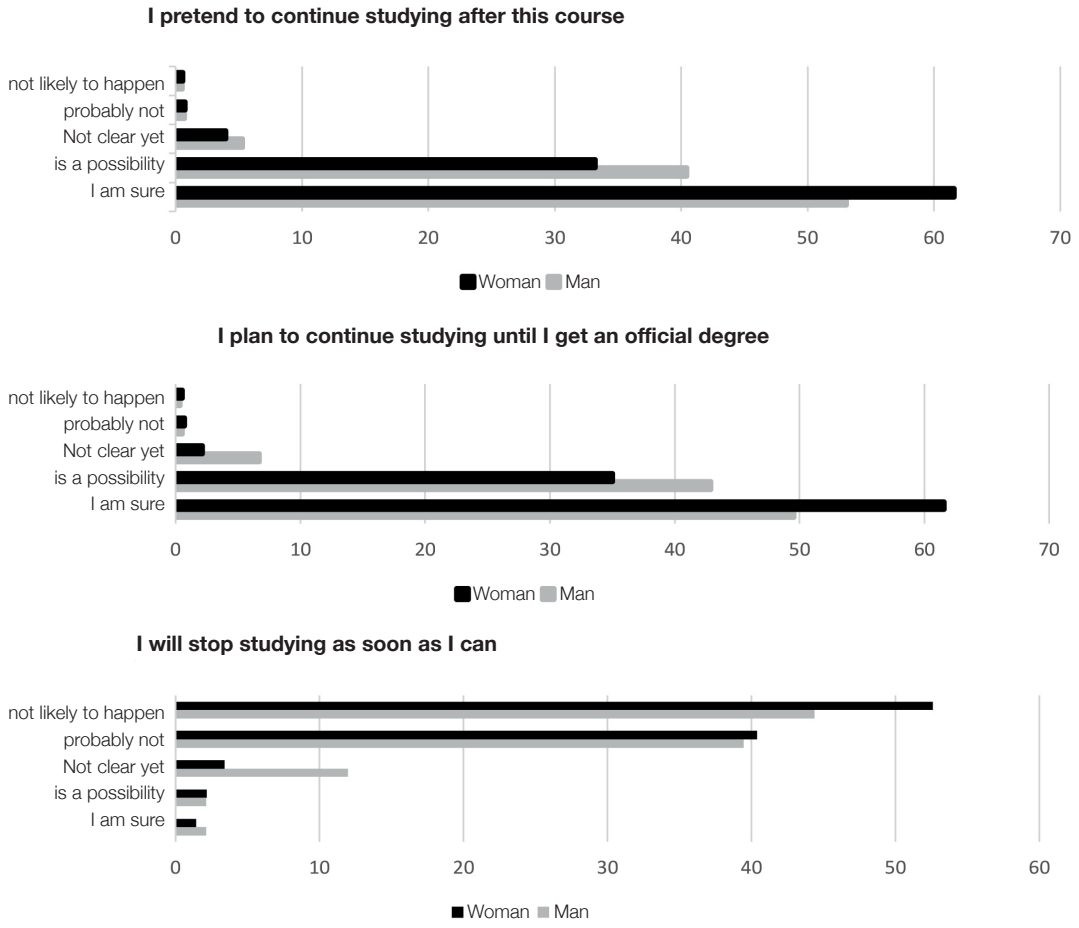


Note. Own elaboration from Suberviola (2021).

3. Results

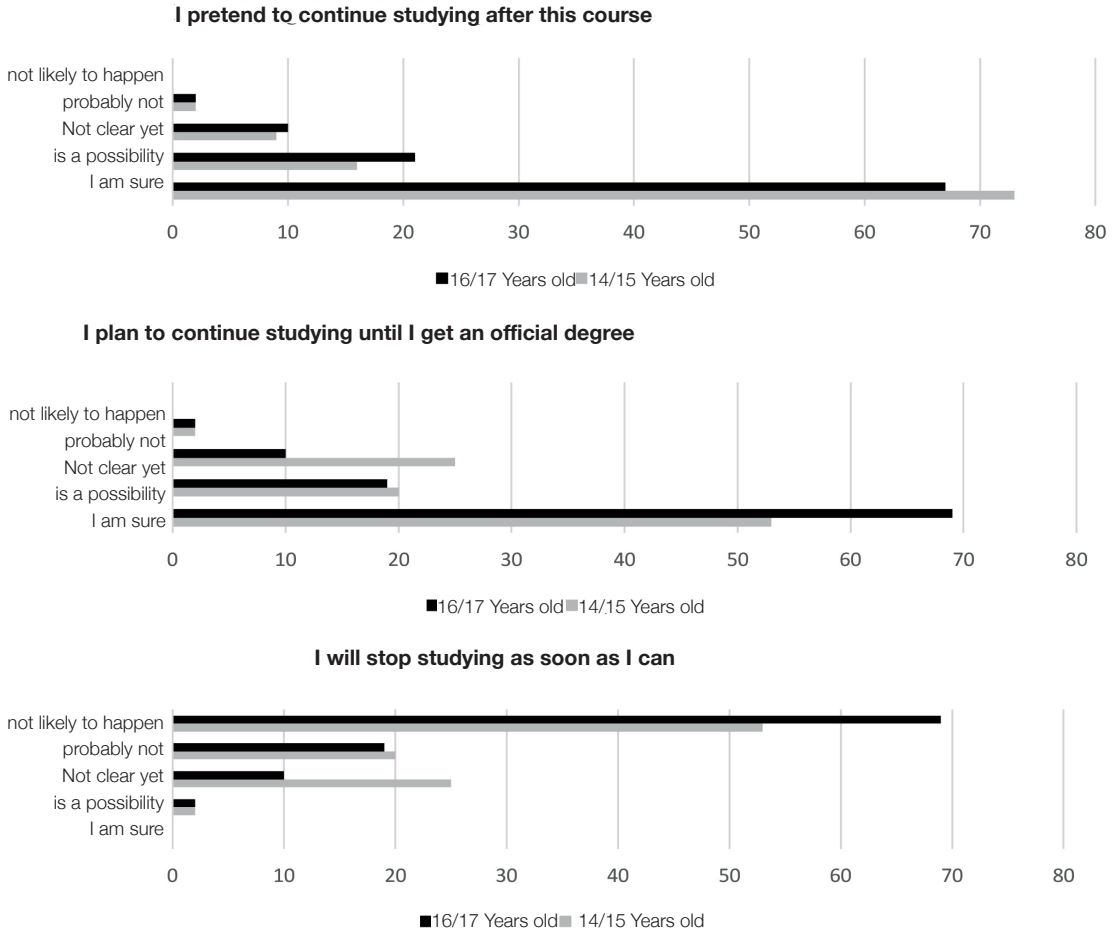
As for the "gender" variable, a greater number of women say they intend to continue studying in the following school years, specifically 75% of students compared to 50% of students. On the other hand, 50% of women say they want to stay in school even though they could do so without negative consequences, compared to a low 25% of men who say they would continue studying under such conditions. The following figure presents the graphs generated from the answers given by the students surveyed to the three items on intention to leave.

Figure 2. *Gender vs intention to drop out*



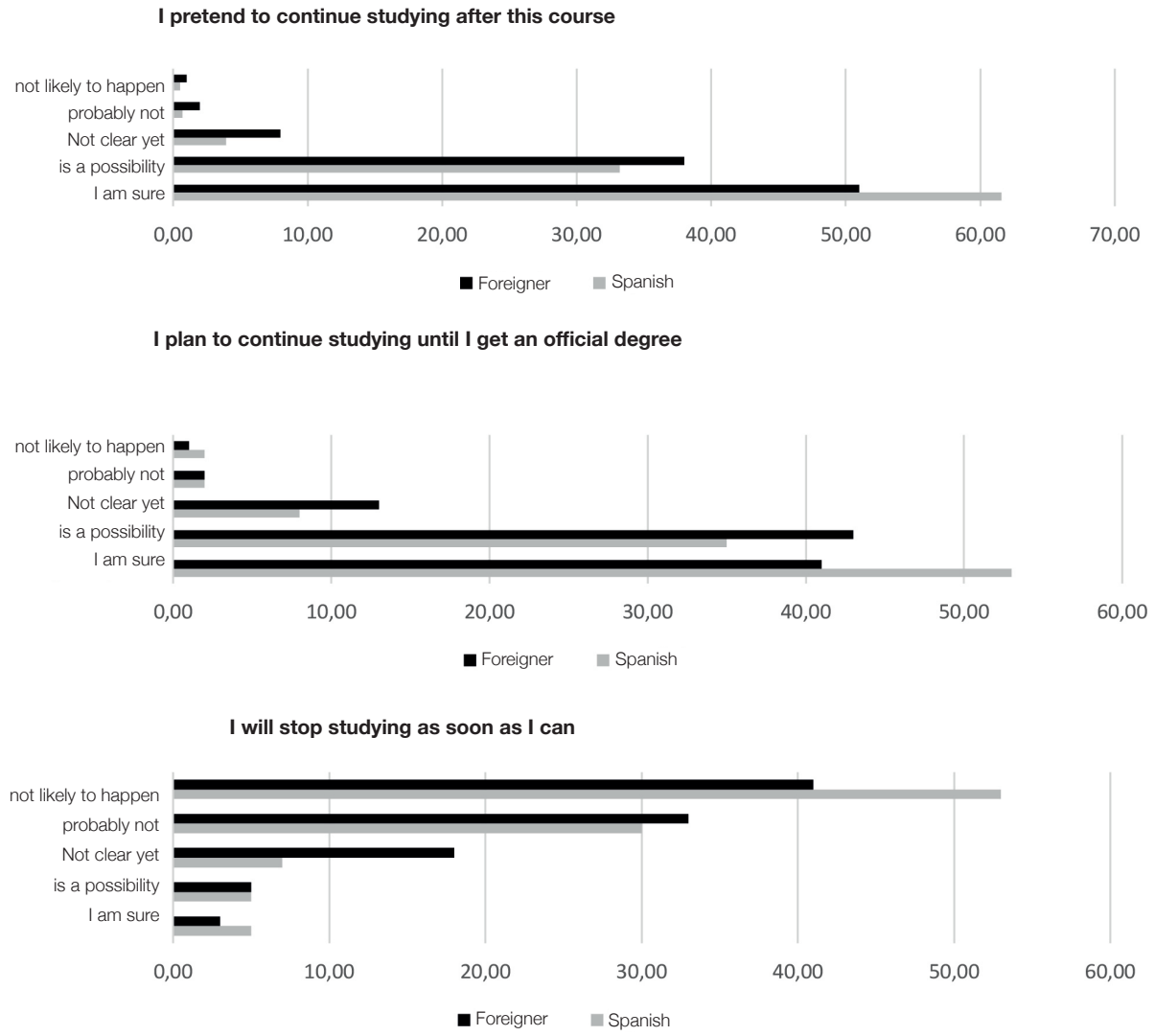
Regarding the variable "age", some differences are observed between the different groups, being the students of ≥18 years the one who presents the greatest intention of drop out, while the younger students present more insecurity about their academic future, since 18% of the students of 14-15 years say they are not clear if they will continue studying once obtained the official degree.

Figure 3. *Age vs. intention to drop out*



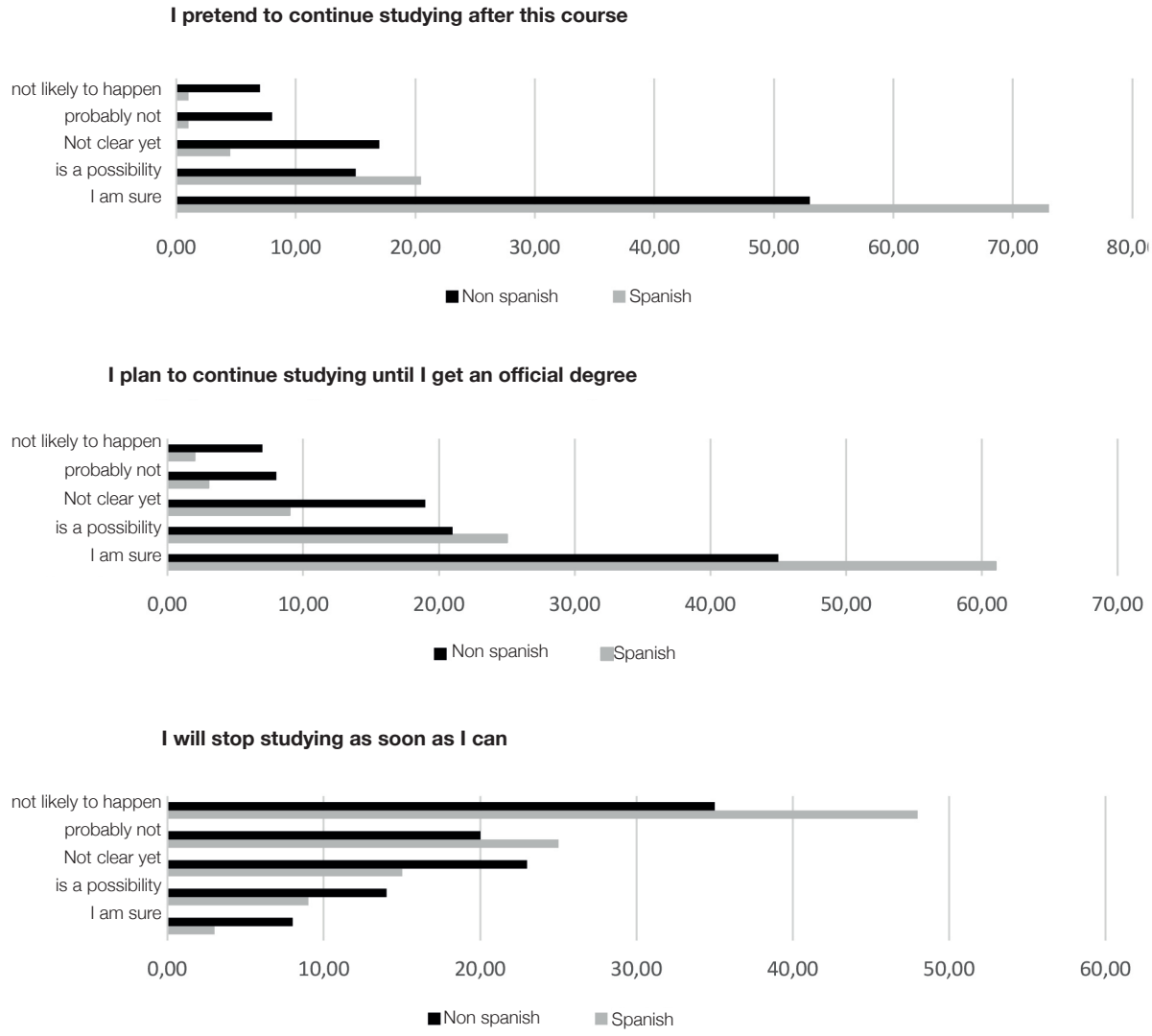
Regarding the variable "nationality", it is observed that students with Spanish nationality have a lower intention to drop out both in the short and medium term, with a difference of more than 10 percentage points in the answer *of course* in the first two questions. Among foreign students, those from Romania are the group of students who affirm a greater intention to continue studying the next year. As for the *intention* parameter *to drop out as soon as possible*, the greatest number of affirmative answers are obtained from students from Morocco.

Figure 4. *Nationality vs. intention to drop out*



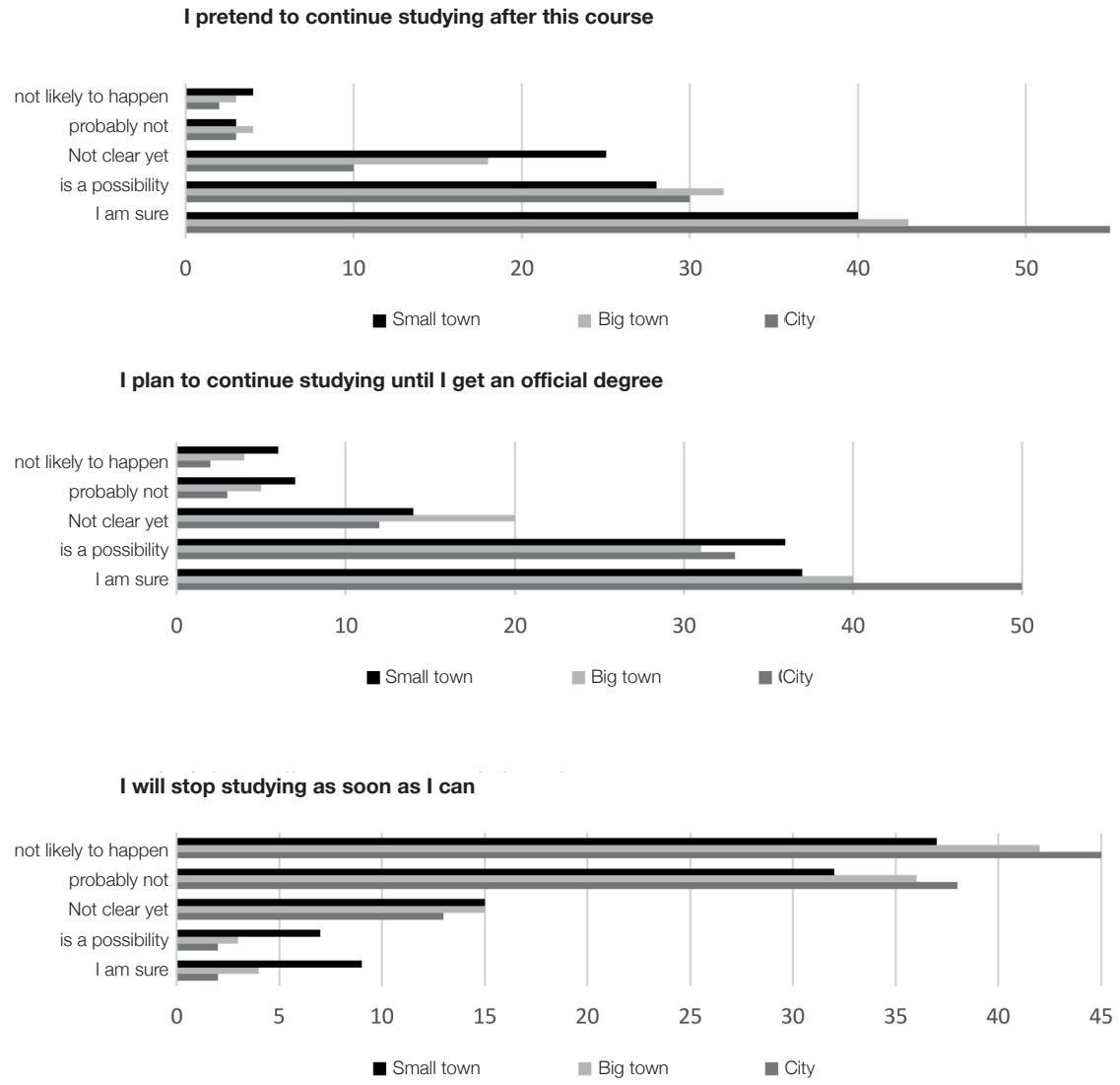
As seen in Figure 5, students with a non-Spanish mother tongue have a lower intention of continuing their studies both in the short and long term, compared to students with a Spanish mother tongue, whether or not they are Spanish nationals.

Figure 5. *Mother tongue vs. intention to drop out*



As for the variable "place of residence" we can see how the student residing in the city is the one who has the greatest intention of continuing the studies in the short and long term, while the student residing in rural areas affirms the greatest intention of abandoning the studies as soon as they can do so.

Figure 6. *Place of residence vs intention to drop out*



4. Discussion

Few issues related to education are as complex but necessary to address as the problem of Early School dropout, due to the consequences of this phenomenon both at the individual level in people who decide to drop out school early, and at the collective level in the social and economic fields (European Education and Culture Executive Agency, 2019; González-Rodríguez et al., 2019; Organización Mundial de la Salud, 2021).

Consistent with the objective, based on an exhaustive literature review and the results found in the study, the hypotheses raised are discussed.

Regarding the hypothesis "Masculine students have a greater intention to drop out of school", the percentages obtained in the study point suggest this hypothesis is true. These data corroborate other research that concludes that gender can be taken as a predictive characteristic of the dropout of studies, positioning it as one of the protective factors of it (Choi de Mendizábal & Calero, 2013; Rizo & Hernández, 2019; Rodríguez-Pineda & Zamora, 2021; Sáinz et al., 2021; Sánchez-Alhambra, 2017; Santana et al., 2023). The results obtained should make us reflect on a gender differential socialization that can mediate the actions and academic decisions of women, in addition to other socio-educational

conditions that influence the masculine students present less intention to continue studying. A fact that could explain these results is that femenine students consider, to a greater extent than men, that obtaining a degree will allow them better access to the labor market, which will provide them with better employment and salary, in addition to greater social prestige. This observation is supported by data provided by the Spanish Confederation of Business Organizations (2019). These data show that, despite having a similar level of education, women tend to receive lower wages and hold fewer senior positions compared to men. It is notable that women predominate in sectors such as services, health and education, as well as in administrative roles and occupations that do not require formal qualifications. However, even within the same educational level, femenine-dominated professions tend to have lower average wages than others, suggesting that occupational segregation also contributes to widening wage differences between men and women.

In the hypothesis "Older students show greater intention to drop out school before achieving a post-compulsory degree", the results suggest that this hypothesis is true. However, it should be considered that students over 17 years old who have responded to our survey necessarily had to repeat some school year and there are important number of studies that affirm that the repetition of school year, regardless of the stage in which it occurs, can be labeled as one of the most important indicators that foresee Early School Drop out (Camacho, 2018; Cerdà et al., 2020). Currently, Spain leads the repetition rate with 9% of repetitive students in the first three ESO courses, quadrupling the European Union average, which stands at 2% (González, 2021). Current education legislation recognizes this problem and seeks to address it by reducing the extraordinary rate of repetition and the consequent increase in early school dropout. In this regard, measures and resources are being implemented to reduce this percentage. The Organic Law of Modification of the Organic Law of Education (LOMLOE) of 2020 establishes conditions for repeting the course to go from being an ordinary practice to being an exceptional measure. It is sought that repetition be adopted only after having exhausted other means for the recovery of unrealized learnings.

Several studies carried out on the relationship between repetition and effectiveness in PISA tests show that the results of the evaluations carried out related to the key competences of repeating students are clearly lower than those of non-repeaters, pointing out that repetition does not have a favorable impact on school performance, but on the contrary, makes it a predictor of failure and drop out of studies (Francesch, 2020; García-Perales & Jiménez-Fernández, 2018), so the OCDE recommends its reduction to promote a more egalitarian and effective education "The less repetition, the more equitable the educational system and the less close association between the student's socioeconomic level and his performance" (OECD, 2021, p. 11).

Regarding the hypothesis "Foreign students affirm greater intention to drop out studies", the study shows that Spanish students have a lower intention to drop out than foreign students. Specifically, those students who come from Morocco show a greater intention to drop out the studies as soon as possible, data that correlate with the research carried out by Carrasco et al. (2018), González-Rodríguez et al. (2019), Nada et al. (2020) and Rizo and Hernández (2019). However, this hypothesis must necessarily be interpreted along with the hypothesis "Students with a non-Spanish mother tongue have a higher risk of early school dropout", which, as the data show, non-Spanish students have a higher rate of dropout, being specifically those whose first language is Arabic the ones with the greatest intention of drop out. The results obtained in both hypotheses can be influenced by the political-educational actions related to the attention to diversity that are developed in the schools participating in the study.

In this sense, it should be considered that students with Specific Needs of Educational Support (ACNEAE), either due to lack of knowledge of the language or due to late incorporation into the educational system, have higher rates of school dropout (García-Gracia & Sánchez-Gelabert, 2021; Ros, 2021) and in these cases, as stated by the European Agency for special need and inclusive education (2018), policies aimed at reducing school dropout are correct in including ACNEAE students for these circumstances as a group of potential risk, ensuring that interventions are carried out to keep this group in the educational system, although they have a specific character, they are integrated into educational practices. Likewise, it is considered essential to deploy actions that respond to individual characte-

ristics and carry out premature interventions in the face of individual difficulties, from inclusive practices, when reducing Early School Dropout in general and in students with these traits in particular.

As for the last hypothesis raised in this study "Students living in rural areas score more on the intention to drop out of school", it can be observed that the differences are not significant between groups. One of the possible explanations to this phenomenon could be due to the educational level, since rural areas have a population with a lower level of education than cities (Santamaría, 2018), so it is possible to think that the accompaniment of families in the educational aspects is higher among parents with higher socio-cultural levels, a population group that lives in a greater percentage in urban areas, being their sons and daughters the main protective aspect of the ESD. The fact that there is a higher intention rate to abandon small towns may have its explanation in that we are in an Autonomous Community with a high per capita income, with wine and agriculture being one of the biggest engines of the rural economy, which would place the population of rural areas in a medium-high economic position due to agricultural work that does not need certification. This phenomenon that is typical of some Autonomous Communities can have an impact on a greater intention of drop out since there is the possibility of accessing to the labor market without qualifications (Casquero and Navarro, 2010; Martín-Quintana et al., 2015; Subirats, 2006), in many cases continuing with the family's companies and agricultural tasks in which there can be a medium-high income without a degree. In this line of research, some studies have found a positive relationship between living in areas with youth unemployment rates above the national average and the likelihood of continuing studies. This trend can be interpreted because of the lower opportunity cost for individuals to extend their education in these circumstances. In other words, high youth unemployment can act as an incentive for young people to remain in the education system (Casquero & Navarro, 2010; Subirats, 2006). However, this situation is largely not observed in rural areas of the Community of La Rioja, where agriculture and the wine sector offer high employment opportunities, especially for men (AFI, 2020). In this regard, taking into account the data obtained in reference to the place of residence, educational institutions in rural areas, as well as those in depressed and marginal areas as mentioned above, should be an alert to possible cases of ESD and work to a greater extent, if possible, prophylactic aspects such as motivation and/or involvement of families.

5. Conclusion

From the idea of an inclusive and equitable education proposed at the global level by the 2030 Agenda (Naciones Unidas, 2018) and the LOMLOE (2020) at the national level, this study analyzes the underlying factors related to the identity of the students of potential influence on the intention to drop out studies with the ultimate aim that the different socio-educational institutions can implement more accurate, precise, effective and efficient measures and actions that are constituted as prophylactic actions that protect those students at higher risk of dropout. In short, it is crucial to develop an educational model that considers the diversity of students with the aim of achieving effective inclusion. This implies minimizing various physical, sensory, cognitive and sociocultural barriers that students may face to promote equal opportunities in access and permanence in education. From this perspective, Universal Design for Learning (UDL) provides a strong framework to address these needs and ensure an accessible and enriching educational environment for all students.

The main findings in this regard suggest that some identity traits of students influence the purpose of students to continue their training process. Specifically, it has been found that masculine students have a higher rate of intention to drop out school prematurely, possibly due to the difference in job opportunities between genders without obtaining a degree. In addition, the study also shows that older students have the least intention of continuing with studies until obtaining a post-compulsory degree, a variable mediated by the weight of the repetition of some school year in early school dropout.

Along with these findings, foreign students, especially those with a non-Spanish language, have a greater intention of drop out. In this sense, socio-educational policies of attention to diversity and specifically to students with ACNEAE linked to these characteristics are relevant.

Living in rural areas is a factor of incidence in the ESD, possibly related with other factors such as the lower educational level of families or the greater possibility of accessing the labor market without degrees.

In conclusion, it is important that the educational system, considering the identity aspects of the students, deploys effective actions aimed at mitigating the ESD. Considering these aspects of the students implies recognizing and valuing the diversity in the classroom, allowing to create an inclusive educational environment where people feel understood, respected and represented. In this way, recognizing and valuing their identity strengthens their self-esteem and motivation, which contributes to reduce dropout rates. For this, it is convenient to design pedagogical strategies that are culturally relevant and contextualized, incorporating in the curriculum content that reflects the socio-cultural diversity of students, thus promoting an education that is meaningful and relevant for all.

Likewise, addressing the identity aspects of students promotes the elimination of structural and socioeconomic barriers that influence school dropout. This means implementing policies and programs that provide equality of opportunity, access to resources, and additional support to students with various disadvantages. In doing so, they are given the tools to overcome obstacles and reach their maximum educational potential.

Considering student identities and taking action to mitigate early school dropout is essential to building an inclusive and equitable education system, since it promotes equal opportunities, strengthens students' identity and self-esteem, creates a meaningful learning environment, and removes barriers that hinder access to and retention in education. Only through conscious and deliberate actions can a more just and equitable society be built, where all students can reach their fully potential.

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Publication Guidelines of «Alteridad»

1. General information

«Alteridad» is a bilingual scientific journal of the Salesian Polytechnic University of Ecuador (UPS), published since January 2006 uninterruptedly, on a semi-annual basis (January-July).

It is an arbitrated scientific journal, with peer-review system under the double-blind review, following the publication standards of the American Psychological Association (APA). This system ensures authors an objective, impartial and transparent review process, making it easier for authors to be included in reference international databases, repositories, and indexes.

«Alteridad» is indexed in the Web of Science's Emerging Sources Citation Index (ESCI), at the Scientific Electronic Library Online (SciELO), in the REDALYC Scientific Information System, in the directory and selective catalog of the Regional Online Information System for Scientific Journals of Latin America, the Caribbean, Spain and Portugal (Latindex), in the Directory of Open Access Journals (DOAJ), in the European Reference Index for the Humanities and Social Sciences (ERIHPLUS), on the Dialnet Portal. It is evaluated in the Information Matrix for Journal Analysis (MIAR), the Integrated Classification of Scientific Journals (CIRC), and the Qualis review system for CAPES journals. In addition, it is in repositories, libraries and specialized catalogs around the world.

The journal is published in two versions: electronic (e-ISSN: 1390-8642) and printed (ISSN: 1390-325X) in Spanish and English; each manuscript is identified with a Digital Object Identifier System (DOI). All articles published in «Alteridad» have the Creative Commons Attribution-Non-Commercial-Share Equal license (RoMEO blue journal).

2. Scope and policies

2.1 Topics

«Alteridad» is a journal specialized in Education and its transdisciplinary topics such as Didactics, School Management, Educommunication, Educational Technology, Social Pedagogy, among others, all related to the main topic.

2.2 Contributions

All manuscripts must be original, and must not have been published in any other journal or must not be in the arbitration or publication process in another journal. Empirical research results are published in Spanish, Portuguese or English, and studies and state-of-the-art are also allowed:

a) **Research:** 5000 to 7500 words, including title, abstracts, descriptors, tables, and references. Assessment will be made of research results, methodological rigor, the relevance of the subject, the quality of scientific discussion, the variety, timeliness, and richness of bibliographic references (preferably publications indexed in JCR and Scopus). At least 35 references must be included.

(b) Studies and literature reviews

- Studies: 5000 to 7500 words of text, including tables and references. The debate, the relevance of the topic, the originality of the contributions and the bibliographical references (preferably of publications indexed in JCR and Scopus) will be especially valued. Expected 35 references minimum.
- Literature reviews: 6000 to 8500 words of text, including tables and references. An exhaustive review of the state of the art of a current research topic will be considered, with justified

and selective references of approximately 70 works (preferably from publications indexed in JCR and Scopus).

2.3 Sections

The journal has a semi-annual periodicity (20 articles per year), published in January and July and has two sections of five articles each by number; the first referring to a **Monographic** topic prepared in advance and with thematic topic and the second, a section of **Miscellaneous**, composed of varied contributions related with educational topics.

3. Editorial process

3.1 Submission of manuscripts

Manuscripts must be submitted only and exclusively through the Open Journal System (OJS), in which all authors must register in advance, although only one will be responsible for the correspondence. No author may submit or review two manuscripts simultaneously, estimating a time of four consecutive numbers (2 years). An article may have a maximum of 3 authors, although if justified depending on the study, there may be up to 5.

«Alteridad» informs by email the reception of the manuscript submitted by the authors. The information related to the acceptance or rejection of the manuscript is sent by email and the platform; and in the case of acceptance, the author is also informed of the editing process.

The Guidelines for the Authors are on the website of the journal, in the Guidelines section, as well as the template for writing the paper (LaTeX/Overleaf or Word), the cover page and cover letter, the review protocol, the pre-submission list, the evaluation forms by the external reviewers and a guide for submitting the article through OJS. Before the submission, it is strongly recommended that the manuscript be checked with the Pre-Check Protocol. Two files should be sent simultaneously:

a) **Cover page and cover letter** (use the official model), which must include:

- **Cover page** (Title, Abstract and key words provided in the Manuscript).
- **Full name of each of the authors**, organized in priority order; followed by the professional category, institution, email of each author and ORCID number. It is mandatory to indicate if the authors have a PhD academic degree (include Dr. before the name).
- A **Cover letter** will also be included indicating that the manuscript is an original contribution, has not been sent or evaluated in another journal, with the signature of the authors, and acceptance (if applicable) of formal changes to the manuscript compliant with the rules and partial transfer of rights to the publisher.

b) Fully anonymized **manuscrip**t, in accordance with the rules referred to in section 4.

3.2 Review process

Upon having received the document and in a maximum period of 30 days, the correspondence author shall receive a notification, indicating whether the manuscript is considered or dismissed for the arbitration process by the scientific reviewers. In case that the article has formal problems or does not address the educational subject or has a high similarity percentage to another document(s), the editorial board shall reject the paper without the option to send it back. Conversely, if it has superficial problems, it will be returned to the author for corrections before starting the evaluation process. The submission date of the article will be considered based on the final submission when the article is presented with the corrections.

The articles will be scientifically evaluated by an average of three experts of the topic. Reports will indicate the following recommendations: Accept the Submission, Publishable with Modifications, Sent the manuscript back for its Review, Not Publishable. The acceptance or rejection of the manuscript for its publication will be decided from the analysis of external reports. In the case of dissenting results, it shall be forwarded to a new opinion, which shall be final. The protocol used by reviewers is public (researches; studies and state-of-the-art).

In general, once the external scientific reviews are taken into view, the criteria justifying the decision on the acceptance/rejection of the manuscript by the Editorial board are:

- Current and novelty.

- Relevance and significance: advancement of scientific knowledge.
- Originality.
- Reliability and scientific validity: proven methodological quality.
- Organization (logical coherence and formal presentation).
- External support and public/private funding.
- Co-authoring and internationalization degree of the proposal and the team.
- Presentation: good writing.

The timeline for the scientific evaluation of manuscripts after the previous estimation procedures by the Editorial Board is up to 100 days. As for the manuscripts sent for Calls for papers, their scientific review dates begin once the call finishes. Manuscripts that are positively evaluated and require modifications must be sent with the changes within the next 15 days.

3.3 Editing and publishing of the manuscript

The edition and layout processes of the accepted articles is performed by the Technical Board of the journal along with the Abya-Yala Editorial. «Alteridad» reserves the right to make style corrections and editorial changes if necessary to improve the manuscript. A proof of printing in PDF format will be sent to the authors for correcting typography and spelling, and its review and comments must be sent within three days. The Editorial provides authors a free professional translation of the final version of the manuscript into English (or Spanish, according to the original version), guaranteeing its international consultation and dissemination. Articles will be published on the journal's platform in both versions (Spanish and English) and in the following formats: PDF, HTML, EPUB and XML-Jats.

4. Structure of the manuscripts

The manuscripts shall be submitted in typeface Arial 10, simple spacing, fully justified and without tabs or white space between paragraphs. Only large blocks (title, authors, abstracts, key words, credits, and captions) will be separated with white space. The page must be two centimeters in all its margins. Manuscripts must be submitted in Microsoft Word document (.doc or .docx), (https://alteridad.ups.edu.ec/pdf/alteridad/Microsoft_Word_Template.docx) o LaTeX/ Overleaf (.tex) (https://www.overleaf.com/latex/templates/revista-alteridad-ecuador/svvjcbgmcrrv), requiring the file to be anonymized in File Properties to avoid the information related to the identification of the author/s.

4.1 Cover page

Title (Spanish and English): Concise but informative, in Spanish in the first line and in English in the second, consisting of as many significant terms as possible. The title is not only the responsibility of the authors, hence changes can be proposed by the Editorial Board. A maximum of 80 characters with space are accepted.

Abstract (Spanish and English): It must be concise and must follow this order: justification, objectives, methodology used (approach and scope), more relevant results, discussion, and main conclusions. It must be written impersonally "The present work analyzes...". In the case of the Abstract (in the other language), the use of automatic translators will not be accepted. It will be between 220/230 words.

Key words (Spanish and English): 6 keywords must be presented for each language, and must be directly related to the topic of the manuscript. The use of the keywords presented in UNESCO's Thesaurus is recommended (http://bit.ly/2kIgn8I). New terms would be accepted only in exceptional cases if they present a standardized scientific nature.

4.2 IMRDC Structure

For those works involving empirical research, the manuscripts will strictly respect the IMRDC structure, with the headings of Economic Supports and Notes being optional. Literature Studies and Reviews may be more flexible under their headings, especially in Methodology, Results and Discussion. In all types of works, bibliographic references are mandatory.

1. **Introduction:** It should include the theoretical foundations and purpose of the study, using bibliographic citations, as well as the review of the most significant literature of the topic at the national and international level. The use of high-impact references (JCR and Scopus) will be positively valued.

2. **Methodology:** The approach and methodology used must be written in a way that the reader can easily understand the development of the research. It should contain the explanation on the approach (quantitative, qualitative or mixed) and the scope (exploratory, descriptive, correlational or explanatory). When appropriate, it shall describe the sample and the sampling form, and it must refer to the type of statistical analysis applied. If it is an original methodology, it is necessary to set out the reasons that have led to its use and describe the possible limitations.
3. **Results:** Efforts will be made to highlight the most relevant results and observations of the investigation, describing, without making judgments, the material and methods used for the analysis. The results will be presented in figures and/or tables according to the journal's standards (See section 4.4). They will appear in a logical sequence in the text, tables or figures, avoiding data redundancy.
4. **Discussion and conclusions:** It will summarize the most important findings, relating the observations with interesting studies, pointing to contributions and limitations, without resulting in data already commented in other sections. In addition, this section should include deductions and lines for future research.

4.3 Economic support and notes

Economic support (optional): Council Science Editors recommends that authors specify the source of funding for the research. Works on the endorsement of competitive national and international projects will be considered a priority. In any case, for the scientific assessment of the manuscript, it must be anonymized with XXXX only for its initial evaluation, in order not to identify authors and research teams, which must be set out in the Cover Letter and subsequently in the final manuscript.

Notes: if necessary, notes will be at the end of the article (before references). They should be used to clarify terms or make marginal annotations. Note numbers are placed in superscript, both in the text and in the final note. Notes collecting simple bibliographic citations (without comments) are not allowed, as these should be in the references. If it contains a cite, the reference must also be found in the Bibliography section.

4.4 Bibliography

Bibliographical citations should be reviewed in the form of references to the text. Bibliography that is not cited should not be included in the text. Its number must be sufficient and necessary to contextualize the theoretical framework, methodology used and research results in an international research space: minimum 35 for empirical research manuscripts, and around 70 for literature studies and reviews.

They will be presented alphabetically by the author's first last name (adding the second one only in case the first one is very commonly used). The quote should be extracted from the original documents, preferably journals and to a lesser extent books. Given the significance of citation indixes and impact factor calculations, the use of references from indexed publications in JCR and/or Scopus and the correct citation following APA 7 norms is valued (http://bit.ly/35FNGvN).

It is mandatory that references with DOI (Digital Object Identifier System) be written in the References (can be obtained on https://search.crossref.org/). All journals and books without DOI must contain a link (in its online version, if applicable, and in a shorten version using Bitly: https://bitly.com/), and the websites must include the consultation date using the format provided.

Journal articles must be presented in English, with the exception of those in Spanish and English, in which case they will be presented in both languages using square brackets.

Norms for the references

a) Periodic publications

- **Journal article (one author):** Ochoa, A. (2019). The type of participation promoted in schools is a constraint factor for inclusive education. [El tipo de participación que promueve la escuela, una limitante para la inclusión]. *Alteridad*, *14*(2), 184-194. https://doi.org/10.17163/alt.v14n2.2019.03
- **Manuscript from a journal (until twenty authors):** Guarderas, P., Larrea, M., Cuvi, J.,

Vega, C., Reyes, C., Bichara, T., Ramírez, G., Paula, Ch., Pesantez, L., Íñiguez, A., Ullauri, K., Aguirre, A., Almeida, M., & Arteaga, E. (2018). Sexual harassment in Ecuadorian universities: content validation for instrument development. [Acoso sexual en las universidades ecuatorianas: validez de contenido de un instrumento de medición]. *Alteridad, 13*(2), 214-226. https://doi.org/10.17163/alt.v13n2.2018.05

- **Manuscript from a journal (without DOI): López, L., &** Ramírez-García, A. (2014). Medidas disciplinarias en los centros educativos: ¿Suficientes contra el acoso escolar? *Perfiles Educativos, 36*(145), 32-50. *https://bit.ly/37Xd5mw*

b) Books and chapters of books

- **Complete books:** Cuéllar, J.C., & Moncada-Paredes, M.C. (2014). *El peso de la deuda externa ecuatoriana.* Abya-Yala.
- **Chapter of books:** Padilla-Verdugo, J. (2014). La Historia de la Educación desde los enfoques del conocimiento. In E. Loyola (Ed.), *Ciencia, Tecnología y Sociedad (CTS). Miradas desde la Educación Superior en Ecuador* (pp. 107-128). Abya-Yala. https://bit.ly/3etRnZH

c) PhD or Master dissertations

- Llorent, M. (2019). *Las políticas educativas TIC en el plano autonómico: el caso de Andalucía* [Tesis doctoral, Universidad de Sevilla]. Depósito de Investigación Universidad de Sevilla. https://bit.ly/3YRTRr5

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The headings of the article shall be numbered in Arabic, without full case of capital letters, no underscores, no bold ones. The numbering must be at most three levels: 1. / 1.1. / 1.1.1. A carriage return will be established at the end of each numbered heading.

Tables and figures must be presented in the text in Word or LaTeX located in the place selected by the authors. They shall be used only when necessary and suitable, and must be up to 6 between tables and figures (more only under extraordinary cases if justified). Both must be listed in Arabic and titled with the description of their content. If the source of the table or figure corresponds to another author, the authors must incorporate the source consulted below the table [for example, Source: Romero-Rodríguez (2016, p. 32)].

Tables must be elaborated in document, thus tables cut and pasted from other documents that cannot be edited in the diagramming process will not be accepted. The figures, in addition to being incorporated in the document, must be sent as supplementary material when submitting to «Alteridad» OJS, with a quality greater than 600 dpi, in TIFF, JPEG or PNG files.

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The authors commit to disseminate their published article as well as to the whole journal using the link of the website of "Alteridad" (https://alteridad.ups.edu.ec/index.php/alteridad/). In addition, they are encouraged to share their published article in academic networks (Academia.edu, ResearchGate, Mendeley, Kudos, ...), social networks (Twitter, Facebook, LinkedIn, ..., also publishing the DOI in these), institutional repositories, Google Scholar, ORCID, web or personal blog, among others. Authors are also encouraged to share the published article through email lists, research groups, and personal contacts.

«Alteridad» has a Metric Measurement System (PlumX) that allows verifying the compliance with this commitment. The impact of previous works will be considered for submitting future articles in «Alteridad».

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Normas de publicación en «Alteridad»

1. Información general

«Alteridad» es una publicación científica bilingüe de la Universidad Politécnica Salesiana de Ecuador (UPS), editada desde enero de 2006 de forma ininterrumpida, con periodicidad fija semestral (enero-julio).

Es una revista científica arbitrada, que utiliza el sistema de evaluación externa por expertos (*peer-review*), bajo metodología de pares ciegos (*doble-blind review*), conforme a las normas de publicación de la *American Psychological Association* (APA). El cumplimiento de este sistema permite garantizar a los autores un proceso de revisión objetivo, imparcial y transparente, lo que facilita a la publicación su inclusión en bases de datos, repositorios e indexaciones internacionales de referencia.

«Alteridad» se encuentra indexada en el *Emerging Sources Citation Index* (ESCI) de *Web of Science*, en la *Scientific Electronic Library Online* (SciELO), en el Sistema de Información Científica REDALYC, en el directorio y catálogo selectivo del Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal (Latindex), en el *Directory of Open Access Journals* (DOAJ), en el *European Reference Index for the Humanities and Social Sciences* (ERIHPLUS), en el Portal Dialnet; está evaluada en la Matriz de Información para el Análisis de Revistas (MIAR), en la Clasificación Integrada de Revistas Científicas (CIRC), y en el sistema Qualis de revisión de revistas de CAPES. Además, se encuentra en repositorios, bibliotecas y catálogos especializados de todo el mundo.

La revista se edita en doble versión: electrónica (e-ISSN: 1390-8642) e impresa (ISSN: 1390-325X) en español e inglés; siendo identificado cada trabajo con un *Digital Object Identifier System* (DOI). Todos los artículos publicados en «Alteridad» tienen licencia Creative Commons Reconocimiento-NoComercial-Compartir igual (RoMEO blue journal).

2. Alcance y política

2.1 Temática

«Alteridad» es una revista especializada en Educación y sus líneas transdisciplinares como Didáctica, Gestión de Centros Escolares, Educomunicación, tecnología educativa, Pedagogía Social, entre otras; y todas aquellas disciplinas conexas interdisciplinarmente con la línea temática central.

2.2 Aportaciones

Todos los trabajos deben ser originales, no haber sido publicados en ningún medio ni estar en proceso de arbitraje o publicación. Se editan preferentemente resultados de investigación empírica, redactados en español, portugués o inglés, siendo también admisibles estudios y selectas revisiones de la literatura (*state-of-the-art*):

a) **Investigaciones:** 5000 a 7500 palabras de texto, incluyendo título, resúmenes, descriptores, tablas y referencias. Se valorarán especialmente los resultados de la investigación, el rigor metodológico, la relevancia de la temática, la calidad de la discusión científica, la variedad, actualidad y riqueza de las referencias bibliográficas (preferiblemente de publicaciones indexadas en JCR y Scopus). Se esperan mínimo 35 referencias.

b) **Estudios y revisiones de la literatura**

- **Estudios:** 5000 a 7500 palabras de texto, incluidas tablas y referencias. Se valorará especialmente el debate generado, la relevancia de la temática, la originalidad de las aportaciones y riqueza de las referencias bibliográficas (preferiblemente de publicaciones indexadas en JCR y Scopus). Se esperan mínimo 35 referencias.
- **Revisiones de la literatura:** 6000 a 8500 palabras de texto, incluidas tablas y referencias. Se

valorará la revisión exhaustiva del estado de la cuestión de un tema de investigación actual con referencias justificadas y selectivas de alrededor de 70 obras (preferiblemente de publicaciones indexadas en JCR y Scopus).

2.3 Secciones

La revista tiene periodicidad semestral (20 artículos por año), publicada en los meses de enero y julio y cuenta por número con dos secciones de cinco artículos cada una, la primera referida a un tema **Monográfico** preparado con antelación y con editores temáticos y la segunda, una sección de **Misceláneas**, compuesta por aportaciones variadas que traten temas educativos de forma prioritaria.

3. Proceso editorial

3.1 Envío de manuscritos

Los manuscritos deben ser enviados única y exclusivamente a través del *Open Journal System* (OJS), en el cual todos los autores deben darse de alta previamente, si bien uno solo de ellos será el responsable de correspondencia. Ningún autor podrá enviar o tener en revisión dos manuscritos de forma simultánea, estimándose una carencia de cuatro números consecutivos (2 años). Un artículo podrá tener como máximo 3 autores, aunque si se justifica en función del tamaño del estudio, podrán ser hasta 5.

«Alteridad» acusa recepción de los trabajos enviados por los autores e informa por email y mediante la plataforma del proceso de aceptación o rechazo; y en el caso de aceptación, del proceso de edición.

En el Portal oficial de la revista, en la sección Normativas, están las Normas para Autores, las plantillas para la redacción de los manuscritos (LaTeX/Overleaf o Word), la Portada y Carta de presentación, el Protocolo de chequeo previo al envío, los formularios de evaluación por parte de los revisores externos y una guía para el envío del artículo a través de OJS. Antes de su envío se recomienda encarecidamente que se compruebe el manuscrito con el Protocolo de chequeo previo. Deben remitirse simultáneamente dos archivos:

a) Portada y Carta de presentación (usar el modelo oficial), en la que aparecerán:

- **Portada** (Título, Resumen y Descriptores previstos en el Manuscrito).
- **Nombre y apellidos completos** de cada uno de los autores, organizados por orden de prelación; seguido por la categoría profesional, centro de trabajo, correo electrónico de cada autor y número de ORCID. Es obligatorio indicar si se posee el grado académico de doctor (incluir Dr./Dra. antes del nombre).
- Se incluirá además una **declaración** (Cover letter) de que el manuscrito se trata de una aportación original, no enviada ni en proceso de evaluación en otra revista, confirmación de las autorías firmantes, aceptación (si procede) de cambios formales en el manuscrito conforme a las normas y cesión parcial de derechos a la editorial.
- **Manuscrito** totalmente anonimizado, conforme a las normas referidas en el epígrafe 4.

3.2 Proceso de revisión

En un plazo máximo de 30 días, a partir de la recepción del documento, el autor de correspondencia recibirá una notificación, indicando preliminarmente si se estima o desestima para el arbitraje por los revisores científicos. En el caso de que el artículo presente deficiencias formales, no trate el tema educativo o tenga un elevado porcentaje de similitud con otro(s) documento(s), el Consejo editorial desestimará el trabajo sin opción de vuelta. Por el contrario, si presenta carencias superficiales de forma, se devolverá al autor para su corrección antes de comenzar del proceso de evaluación. La fecha de recepción del artículo no computará hasta la recepción correcta del mismo.

Los artículos serán evaluados científicamente por una media de tres expertos en el tema. Los informes indicarán las siguientes recomendaciones: Aceptar el envío, Publicable con modificaciones, Reenviar para revisión, No publicable. A partir del análisis de los informes externos, se decidirá la aceptación o rechazo de los artículos para su publicación. En el caso de resultados discrepantes se remitirá a un nuevo dictamen, el cual será definitivo. El protocolo utilizado por los revisores es público (Investigaciones; Estudios y revisiones de la literatura).

En general, una vez vistas las revisiones científicas externas, los criterios que justifican la decisión sobre la aceptación/rechazo de los trabajos por parte del Consejo Editor son los siguientes:

- Actualidad y novedad.
- Relevancia y significación: avance del conocimiento científico.
- Originalidad.
- Fiabilidad y validez científica: calidad metodológica contrastada.
- Organización (coherencia lógica y presentación formal).
- Apoyos externos y financiación pública/privada.
- Coautorías y grado de internacionalización de la propuesta y del equipo.
- Presentación: buena redacción.

El plazo de evaluación científica de manuscritos, superados los trámites previos de estimación por el Consejo Editor, es de 100 días como máximo; los remitidos para *Calls for papers*, sus fechas de revisión científica se inician al cierre de los mismos. Los trabajos que sean evaluados positivamente y requieran modificaciones, deberán ser reenviados con los cambios, dentro de los siguientes 15 días.

3.3 Edición y publicación del manuscrito

El proceso de corrección de estilo y maquetación de los artículos aceptados es realizado por el Consejo Técnico de la Revista en coordinación con la Editorial Abya-Yala. «Alteridad» se reserva el derecho de hacer corrección de estilo y cambios editoriales que considere necesarios para mejorar el trabajo. A los autores de artículos se enviará una prueba de imprenta en formato PDF para su corrección únicamente de tipografía y ortografía, mismo que deberán reenviar en un máximo de tres días. La Editorial realizará, gratuitamente para los autores, la traducción profesional de la versión final del manuscrito al idioma inglés (o español, según la versión original), lo que garantizará su consulta y difusión internacional. Los artículos serán publicados en la plataforma de la revista en sus dos versiones idiomáticas (español e inglés) y en los siguientes formatos: PDF, HTML, EPUB y XML-Jats.

4. Estructura de los manuscritos

Los trabajos se presentarán en tipo de letra Arial 10, interlineado simple, justificado completo y sin tabuladores ni espacios en blanco entre párrafos. Solo se separarán con un espacio en blanco los grandes bloques (título, autores, resúmenes, descriptores, créditos y epígrafes). La página debe tener dos centímetros en todos sus márgenes. Los trabajos deben presentarse en formato de Microsoft Word (.doc o .docx) (https://alteridad.ups.edu.ec/pdf/alteridad/Plantilla Microsoft Word.docx) o LaTeX/ Overleaf (.tex) (https://www.overleaf.com/latex/templates/revista-alteridad-ecuador/svvjcbgmcrrv), siendo necesario que el archivo esté anonimizado en Propiedades de Archivo, de forma que no aparezca la identificación de autor/es.

4.1 Portada

Título (español) / Title (inglés): Conciso pero informativo, en castellano en primera línea y en inglés en segunda, conformado por el mayor número de términos significativos posibles. El título no solo es responsabilidad de los autores, pudiéndose proponer cambios por parte del Consejo Editorial. Se aceptan como máximo 80 caracteres con espacio.

Resumen (español) / Abstract (inglés): Se describirán de forma concisa y en este orden: justificación del tema, objetivos, metodología empleada (enfoque y alcance), resultados más relevantes, discusión y principales conclusiones. Ha de estar escrito de manera impersonal "El presente trabajo analiza…". En el caso del *Abstract* no se admitirá el empleo de traductores automáticos. Tendrá como extensión entre 220/230 palabras.

Descriptores (español) / Keywords (inglés): Se deben exponer 6 descriptores por cada versión idiomática relacionados directamente con el tema del trabajo. Será valorado positivamente el uso de las palabras claves expuestas en el Thesaurus de la UNESCO (http://bit.ly/2kIgn8I). Solo en casos excepcionales se aceptarán términos nuevos, siempre que tengan un carácter científico estandarizado.

4.2 Estructura IMRDC

Para aquellos trabajos que se traten de Investigaciones de carácter empírico, los manuscri-

tos respetarán rigurosamente la estructura IMRDC, siendo opcionales los epígrafes de Apoyos y Notas. Los trabajos que se traten de Estudios y revisiones de la literatura podrán ser más flexibles en sus epígrafes, especialmente en Metodología, Resultados y Discusión. En todas las tipologías de trabajos son obligatorias las Referencias bibliográficas.

1 **Introducción:** Debe incluir los fundamentos teóricos y el propósito del estudio, utilizando citas bibliográficas, así como la revisión de la literatura o los trabajos relacionados más significativos del tema a nivel nacional e internacional. Se valorará positivamente el uso de referencias de alto impacto (JCR y Scopus).
2 **Metodología:** El enfoque, alcance y diseño metodológico deben ser redactados de forma que el lector pueda comprender con facilidad el desarrollo de la investigación. En su caso, describirá la muestra y la forma de muestreo, así como se hará referencia al tipo de análisis estadístico aplicado. Si se trata de una metodología original, es necesario exponer las razones que han conducido a su empleo y describir sus posibles limitaciones.
3. **Resultados:** Se procurará resaltar los resultados y las observaciones más relevantes de la investigación, describiéndose, sin hacer juicios de valor, el material y métodos empleados para el análisis. Los resultados se expondrán en figuras o/y tablas según las normas de la revista (Ver epígrafe 4.4). Aparecerán en una secuencia lógica en el texto, las tablas o figuras imprescindibles, evitando la redundancia de datos.
4. **Discusión y conclusiones:** Resumirá los hallazgos más importantes, relacionando las propias observaciones con estudios de interés, señalando aportaciones y limitaciones, sin redundar datos ya comentados en otros apartados. Asimismo, el apartado de discusión y conclusiones debe incluir las deducciones y líneas para futuras investigaciones.

4.3 Apoyos y Notas

Apoyos (opcionales): El *Council Science Editors* recomienda a los autor/es especificar la fuente de financiación de la investigación. Se considerarán prioritarios los trabajos con aval de proyectos competitivos nacionales e internacionales. En todo caso, para la valoración científica del manuscrito, este debe ir anonimizado con XXXX solo para su evaluación inicial, a fin de no identificar autores y equipos de investigación, que deben ser explicitados en la Carta de Presentación y posteriormente en el manuscrito final.

Las notas: En caso necesario, irán al final del artículo (antes de las referencias). Deben ser utilizadas para aclarar términos, hacer anotaciones marginales o indicar el posible uso de herramientas de Inteligencia Artificial. Los números de notas se colocan en superíndice, tanto en el texto como en la nota final. No se permiten notas que recojan citas bibliográficas simples (sin comentarios), pues éstas deben ir en las referencias. En caso de contener alguna cita, su referencia deberá encontrarse también en la sección de Referencias bibliográficas.

4.4 Referencias bibliográficas

Las citas bibliográficas deben reseñarse en forma de referencias al texto. No debe incluirse bibliografía no citada en el texto. Su número ha de ser suficiente y necesario para contextualizar el marco teórico, la metodología usada y los resultados de investigación en un espacio de investigación internacional: mínimo 35 para los manuscritos de investigaciones de carácter empírico, y alrededor de 70 para los estudios y revisiones de literatura.

Se presentarán alfabéticamente por el primer apellido del autor (agregando el segundo solo en caso de que el primero sea de uso muy común). Las citas deberán extraerse de los documentos originales preferentemente revistas y en menor medida libros. Dada la trascendencia para los índices de citas y los cálculos de los factores de impacto, se valorarán positivamente el uso de referencias provenientes de publicaciones indexadas en JCR y/o Scopus y la correcta citación conforme a la Norma APA 7 (http://bit.ly/35FNGvN).

Es prescriptivo que todas las citas que cuenten con DOI (Digital Object Identifier System) estén reflejadas en las Referencias (pueden obtenerse en https://search.crossref.org/). Todas las revistas y libros que no tengan DOI deben aparecer con su link (en su versión on-line, en caso de que la tengan, acortada, mediante Bitly: https://bitly.com/), y de los sitios web además la fecha de consulta en el formato indicado.

Normas para las referencias

a) Publicaciones periódicas

- **Artículo de revista (un autor):** Ochoa, A. (2019). The type of participation promoted in schools is a constraint factor for inclusive education. *Alteridad, 14*(2), 184-194. https://doi.org/10.17163/alt.v14n2.2019.03
- **Artículo de revista (hasta veinte autores):** Guarderas, P., Larrea, M., Cuvi, J., Vega, C., Reyes, C., Bichara, T., Ramírez, G., Paula, Ch., Pesantez, L., Íñiguez, A., Ullauri, K., Aguirre, A., Almeida, M., & Arteaga, E. (2018). Acoso sexual en las universidades ecuatorianas: validez de contenido de un instrumento de medición. *Alteridad, 13*(2), 214-226. https://doi.org/10.17163/alt.v13n2.2018.05
- **Artículo de revista (sin DOI):** López, L., & Ramírez-García, A. (2014). Medidas disciplinarias en los centros educativos: ¿Suficientes contra el acoso escolar? *Perfiles Educativos, 36*(145), 32-50. https://bit.ly/37Xd5mw

b) Libros y capítulos de libro

- **Libros completos:** Cuéllar, J.C., & Moncada-Paredes, M.C. (2014). *El peso de la deuda externa ecuatoriana.* Abya-Yala.
- **Capítulos de libro:** Padilla-Verdugo, J. (2014). La Historia de la Educación desde los enfoques del conocimiento. In E. Loyola (Ed.), *Ciencia, Tecnología y Sociedad (CTS). Miradas desde la Educación Superior en Ecuador* (pp. 107-128). Abya-Yala. https://bit.ly/3etRnZH

c) Tesis doctorales y de maestría

- Llorent, M. (2019). *Las políticas educativas TIC en el plano autonómico: el caso de Andalucía* [Tesis doctoral, Universidad de Sevilla]. Depósito de Investigación Universidad de Sevilla. https://bit.ly/3YRTRr5

d) Medios electrónicos

- Aunión, J. (2011, marzo 12). La pérdida de autoridad es un problema de toda la sociedad, no es específico del aula. *El País.* https://bit.ly/2NlM9Dp

Normas para epígrafes, tablas y figuras

Los epígrafes del cuerpo del artículo se numerarán en arábigo. Irán sin caja completa de mayúsculas, ni subrayados, ni negritas. La numeración ha de ser como máximo de tres niveles: 1. / 1.1. / 1.1.1. Al final de cada epígrafe numerado se establecerá un retorno de carro.

Las tablas y figuras deben presentarse incorporadas en el texto en Word o LaTeX ubicadas en el sitio en el que los autores consideren que deben estar. Se emplearán únicamente cuando sean necesarias e idóneas, debiendo limitarse su uso por cuestiones de espacios a seis entre tablas y figuras (salvo casos excepcionalmente justificados). Ambas deben ser enumeradas en arábigo y tituladas con la descripción de su contenido. Si la fuente de la tabla o figura no fuera de elaboración propia, los autores deberán incorporar al pie de la tabla o la figura la fuente de la que se extrae [por ejemplo, Source: Romero-Rodríguez (2016, p. 32)].

Las tablas deben estar elaboradas en el propio documento por lo que no se aceptarán tablas cortadas y pegadas de otros documentos que no puedan ser editados en el proceso de diagramación.

Para mantener la calidad de las figuras, en el caso de LaTeX/Overleaf, deben ser cargadas en la plantilla en formato original PDF, puesto que la conversión desde otros formatos puede disminuir la calidad de la figura. En el caso de Word, además de ser incorporadas en el documento, deberán ser enviadas como material complementario al momento del envío en el OJS de «Alteridad», debiendo tener una calidad superior a 600 dpi, en archivos de tipo TIFF, JPEG o PNG.

5. Tasas y APC

«Alteridad» es una revista *Open Access*, incluida en el *Directory of Open Access Journals* (DOAJ) que oferta toda su producción de forma íntegra online en abierto para toda la comunidad científica. Asimismo, no establece ninguna tasa económica durante todo el proceso editorial para la publicación de los artículos, incluyendo la revisión científica, la maquetación y la traducción de los mismos. No existe ningún *publication fee, ni Article Processing Charge* (APC) vinculados con esta publicación, ni para autores ni para lectores. Asimismo, la revista tiene licencia *Creative-Commons* Reconocimiento-No-Comercial-Compartir igual (RoMEO blue journal), lo que permite libre acceso, descarga y archivo de los artículos publicados. Todos los gastos, insumos y financiamiento de «Alteridad»

provienen de los aportes realizados por la Universidad Politécnica Salesiana.

6. Responsabilidades éticas

Cada autor/es presentará una declaración responsable de autoría y originalidad, así como sus responsabilidades éticas contraídas.

- **Originalidad**: Los trabajos deben ser originales y no deben estar siendo evaluados simultáneamente en otra publicación, siendo responsabilidad de los autores el cumplimiento de esta norma. Las opiniones expresadas en los artículos publicados son responsabilidad del autor/es. «Alteridad», como socio internacional de CrossRef®, emplea la herramienta antiplagio CrossCheck® y iThenticate® para garantizar la originalidad de los manuscritos.
- **Autoría**: En la lista de autores firmantes deben figurar únicamente aquellas personas que han contribuido intelectualmente al desarrollo del trabajo. Haber colaborado en la recolección de datos no es, por sí mismo, criterio suficiente de autoría. «Alteridad» declina cualquier responsabilidad sobre posibles conflictos derivados de la autoría de los trabajos que se publiquen.
- **Uso de Inteligencia Artificial**: En caso de que se utilice inteligencia artificial en cualquier etapa de la investigación presentada en el artículo, se requerirá a los/as autores/as destacarlo claramente en la carta de presentación/coverletter asociado al artículo, manifestando la sección o secciones específicas donde se ha hecho uso de la inteligencia artificial. Esta indicación tiene como objetivo informar a los lectores sobre las secciones en las que se ha empleado esta tecnología, proporcionando una mayor transparencia y comprensión sobre su aplicación en la investigación presentada.

  La revista Alteridad reconoce la importancia de mantener altos estándares éticos en la investigación científica, particularmente en el empleo de inteligencia artificial (IA).

  Queda a discreción del equipo editorial, la aceptación de la publicación que haya utilizado inteligencia artificial.
- **Transmisión de los derechos de autor**: se incluirá en la carta de presentación la cesión de derechos del trabajo para su publicación en «Alteridad». La Universidad Politécnica Salesiana (la editorial) conserva los derechos patrimoniales (copyright) de los artículos publicados; favorece y permite la reutilización de las mismas bajo la licencia de uso indicada en *ut supra*.

7. Promoción y difusión del artículo publicado

Los autores se comprometen a darle la máxima difusión a su artículo publicado, así como a toda la revista, utilizando el link a la página web de «Alteridad» (https://alteridad.ups.edu.ec/index.php/alteridad/). Además, se les exhorta a compartir y archivar su artículo publicado en las redes académicas (Academia.edu, ResearchGate, Mendeley, Kudos, …), sociales (Twitter, Facebook, LinkedIn, … , publicando en estos también el DOI), repositorios institucionales, Google Scholar, ORCID, web o blog personal, entre otras. Asimismo, se anima a los autores a compartir el artículo publicado a través de listas de correo electrónico, grupos de investigación y contactos personales.

«Alteridad» cuenta con sistemas de medición de métricas alternativas (PlumX) que permiten verificar el cumplimiento de este compromiso. Para la postulación de futuros artículos de autores de «Alteridad», se tendrá presente el impacto de los trabajos anteriores.