Pedagogía social a través de las TIC: estrategias y prácticas educativas

Social Pedagogy through ICT: educational strategies and practices

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Social Pedagogy through ICT

As a discipline, social pedagogy focuses on social intervention to promote development and learning, especially in people in vulnerable situations or socially excluded. In this context, ICT can be powerful tools to make social pedagogy and expand its scope, considering issues such as access to education, active participation and collaborative learning, project-based learning, monitoring, evaluation, among others..

Editorial

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Social pedagogy can be considered as a discipline that focuses on education in social contexts. It has undergone important changes, mainly caused by the advance of information and communication technologies (ICT), since they have created new challenges and possibilities in education, allowing the development of practices and strategies that promote the inclusion and participation of all people in society.

This monograph will deepen the possibilities of social support or pedagogy through ICT, exploring practices, strategies, and proposals in the development of this field. It will be justified how ICT can be positive to enhance the work of teachers and facilitate access to information, the construction of knowledge, interaction, or communication between different educational agents.

Among the main advantages of ICT in the field of social pedagogy is the ability to break barriers, both temporary and geographical. Internet allows connecting and generating virtual learning spaces that help students to collaborate and participate, regardless of their physical location. This is particularly relevant in contexts where geographical mobility or social exclusion hamper access to educational opportunities. In addition, ICTs offer a wide variety of resources and tools that are tailored to the individual characteristics and needs of students. For example, personalized activities can be designed on virtual platforms, the pace of teaching and learning can be adapted, and individualized feedback can be provided. The diversity of the different digital formats used, such as audios, interactive games, infographics or videos, allows to enrich the teaching and learning process, stimulating the motivation and interest of students.

However, it is important to consider that the use of ICT in social pedagogy does not intend solely to use technology for the simple fact of doing so. It is necessary to reflect on the principles of social pedagogy when using ICT as educational tools, as well as their pedagogical purposes and the ethical values they can bear. Technology must be used critically and reflexively, seeking the benefit of teachers and the construction of a more equitable and inclusive society.

Throughout this monograph, concrete examples of educational practices and strategies that have been developed are presented, using ICT as tools for intervention. It will analyze successful practices, identify challenges for the coming decades and, above all, reflect on the impact of ICT in Social Pedagogy. In this way, the idea is to explore the different opportunities and horizons that open up in this field that is constantly evolving.

The first of the articles in this monograph presents an updated view of Freirean thought. The aim is to integrate multicultural education, as well as inclusive education through the media arts into social education. Efforts are being made to improve education by promoting inclusion through innovative educational programs and a collaborative learning environment. It highlights the importance of critical pedagogy and media literacy, establishing a connection between culture and art in a comprehensive program. It reflects on the training of artists and teachers for the "Virtual School", thus promoting creativity and independence in media arts activities.

Afterwards, the impact of inclusive competence in teaching practice is analyzed. The article focuses on inclusive education and teaching competence as fundamental elements to adequately serve students with special educational needs. A bibliographic review and an analysis of the existing tools are carried out, proposing a theoretical categorization of the most relevant competencies in inclusion. A review was conducted of 24 quantitative studies that assessed perceptions, competencies, and inclusive practices among teachers.

The following article is entitled "The social and cultural context in the reading and writing of upper secondary education". This research aimed to identify the difficulties and the context of writing production in high school students. A qualitative approach was used with the content analysis method. The sample consisted of 100 documents provided by 20 first-year students. The texts discussed were essays, travel books and narrative. The results of this study show that the different practices in these schools reflect the communicative skills acquired by students during their school period, indicating the need for new teaching strategies in reading and writing.

The appearance of forensic-themed television series has led to an increase in interest from the Degree in Criminology. However, this has generated a somewhat distorted image of forensic anthropology and for the students it has meant disappointments in the contents of this degree. The following article proposes the use of an active methodology, problem-based learning (PBL) in secondary education to teach contents of forensic anthropology. The results showed a collaborative and motivating environment, being very favorable the environment created both for the teachers and for the participants enrolled in this degree.

Finally, the article entitled "Use of mobile devices in the classroom to encourage learning". Case study with undergraduate students". This research aims to explore the possible use of mobile devices in the classroom as an emerging and very useful pedagogy. A qualitative approach was developed in which 63 students from 14 focus groups participated. The results conclude the need to incorporate the different mobile devices as a learning tool, focusing attention on their proper use, since they are essential components in current educational approaches and the prohibition of their use is not recommended. On the other hand, it highlights the capacity of teachers to incorporate them as tools that promote the teaching and learning process in the framework of educational innovation.

The miscellaneous section discusses diverse topics, reflecting how education is approached from different points of view.

First, it highlights the important role of school leadership to achieve quality education. Although there has been a lot of research and publication on management skills in the school, the originality of this article is precisely in the approach of the Salesian school. The authors intend to estimate the level of competencies assumed by the managers who work in the school management of Salesian institutions, for which they start from an original formulation of competencies; one of the most significant results is their identification with the Salesian leadership. The study opens up possibilities for research, training of school sector managers in new Salesian contexts and the exchange of good practices.

The importance of vocational training in the current educational approach should also be stressed. It is a flexible alternative that can become very effective in promoting employability, especially in countries such as Portugal, Spain or the Dominican Republic. This article analyzes how education has been adapted to the needs of the labor market, providing the possibilities of professional updating that help develop skills and competencies demanded by companies in these countries; it also highlights that distance education, a topic with great interest in the Fourth Industrial Revolution, has become popular.

Educational innovation has been advocated as an essential element in the training of an inclusive teacher who is able to face the current challenges of education. It aims to address the importance of innovation as one of the fundamental axes to promote inclusion in the classroom and develop tools and strategies that allow teachers to adapt to the individual characteristics of each student and promote an inclusive environment.

The following article aims to address the influence of vicarious learning and behaviors on the initial training of children. It analyzes the possibilities that students learn and are influenced by the behavior of their peers and that can serve as reference models at this important stage of child development. The results

indicate that although children show diverse behaviors according to the environment and activities, they have a higher incidence of aggressive behaviors; on the other hand, the lack of knowledge of teachers on this type of learning is evident.

Finally, the article "Quality of books from the perspective of knowledge management". The study raises a question about the characteristics that a book must have to optimize learning, for which it relates the learning objectives of the subjects with the content of the books with their explicit and tacit knowledge. It is argued that while explicit knowledge is always present in the text and illustrations, tacit knowledge requires strategies to help explore it. This balance is demonstrated by exemplifying it in two themes: poetry and geometry.

The set of articles that make up this edition is undoubtedly an invitation to rich reflections on new educational scenarios with the use of ICT and with an educational and social inclusion perspective, current issues of high importance for an equitable and fair society.

The monographs for 2024 will cover topics on teacher training and educational policies. Regarding the first, as stated in the Call, "teacher training stands as a strategic factor to enable the improvement of the quality of education in an increasingly liquid, changing and diverse society"; this requires solid, continuous training, focused on the development of skills and competencies, so that teachers can adapt to the new challenges posed by education, such as the active participation of students, critical thinking, attention to diversity, the integration of technology, socio-emotional support, among others. On the other hand, educational policies pose challenges such as improving quality, particularly in the Latin American context, curricular flexibility to adapt to the needs of the working environment, equity in access to quality education for all students, adaptation to technological change, promotion of inclusive education, etc. As always, we are happy to receive your manuscripts to arbitrate them and present the result of the research.

Monographic section
(Sección Monográfica)

Social Pedagogy through ICT: educational strategies and practices

"Pedagogía social a través de las TIC: estrategias y prácticas educativas"

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Social Pedagogy and Media Arts: innovative proposal for inclusive schooling

Pedagogía social y artes mediales: propuesta innovadora de la escuela inclusiva

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Abstract

This paper consists of a new vision of Freirean thought to offer in the innovative search for methodological implementation, both multicultural (and multilingual) education and inclusive school, developing media arts activities in the field of social education. Our goal is to apply Freire's the analytical method and the media arts for improving the school education and promoting the educational and social inclusion in the schools, through the innovative educational programs, and a collaborative and respectful learning environment that values the cultural diversity and the equal opportunities for all students. The Freirean approach to thought focuses on the socio-educational relationship in the educational field. It proposes to integrate the socio-educational development, theoretical and practical, into different values and functions of education through the critical pedagogy. This educational proposal seeks to separate the medial arts for transforming the dilemma of critical and medial literacy, and to establish a new relationship between the critical pedagogy and the social education. The influence of Freirean thought involves connecting the culture and the arts in a medial literacy program that includes both the theory and the educational practice. Finally, we propose to open a debate to reflect on the training of teachers and artists for the "virtual school", interacting with inclusive students from diverse cultures to create artistic works and promote independence in medial arts activities.

Keywords: art education, community education, educational sociology, information technology, educational theory, information theory.

Resumen

Este artículo consiste en una nueva visión del pensamiento freireano para ofrecer en la búsqueda innovadora de la implementación metodológica, tanto la educación multicultural (y multilingüe) como la escuela inclusiva, desarrollando las actividades de artes mediales en el campo de la educación social. Nuestro objetivo es aplicar el método analítico de Freire y las artes mediáticas para mejorar la educación escolar y promover la inclusión educativa y social en las escuelas, a través de programas educativos innovadores, y un ambiente de aprendizaje colaborativo y respetuoso que valore la diversidad cultural y la igualdad de oportunidades para todo el alumnado. La aproximación freireana al pensamiento se centra en la relación socioeducativa en el campo educativo. Propone integrar el desarrollo socioeducativo, teórico y práctico, en distintos valores y funcionamientos de la educación mediante la pedagogía crítica. Esta propuesta educativa busca separar las artes mediáticas para transformar el dilema de alfabetización crítica y mediática, y establecer una nueva relación entre la pedagogía crítica y la educación social. La influencia del pensamiento freireano implica conectar la cultura y las artes en un programa de alfabetización mediática que incluya tanto la teoría como la práctica educativa. Finalmente, se propone abrir un debate para reflexionar sobre la formación de docentes y artistas para la "escuela virtual", interactuando con estudiantes inclusivos de diversas culturas para crear obras artísticas y promover la independencia en actividades de artes mediales.

Palabras clave: educación artística, educación comunitaria, sociología de la educación, tecnología de la información, teoría de la educación, teoría de la información.

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1. Introduction

Pedagogy and the media arts have merged because of digital and multimedia technologies, and it seeks to improve teaching and learning in different areas through tools such as the creation of multimedia content and simulation of real situations. It also focuses on developing essential skills for today's society, such as creativity, critical thinking and problem solving. However, Nájera Martínez (2008), says education is a work of art and requires that the teacher be ethical and respect the limits of the students, starting from the cultural and social context of the students, even if conditions are bad; thus, the teacher must reconstruct this context, acting as an artist who recreates and transforms the world through his/her educational work and can redraw, repaint, and re-launch the world for his/her students. This combination of various fields (education, technology and arts) is used in creative and social projects to develop different skills such as teamwork, empathy in education, social communication, problem solving and critical skills. It is important to emphasize that social pedagogy focuses on developing social and emotional skills of students to encourage their participation in the educational community. Media arts involve digital technologies and media for artistic creation.

For this reason, it is essential to apply Paulo Freire's critical pedagogy to the artistic field to develop media literacy by incorporating his approach in contemporary educational theory and *praxis* to improve and promote didactic, social and artistic skills in inclusive education (Bambozzi, 1993; Masi, 2008; Morales Zúñiga, 2014; Nájera Martínez, 2010; Pontes and Pimenta, 2019). Therefore, this proposal focuses on including all students, regardless of their socioeconomic, cultural origin, gender, or skills, promoting cooperative and collaborative learning that foster diversity and respect for differences. In fact, it is possible to raise some questions to reflect on the responsibility of the artist or teacher in the activities of media arts. Who should assume such responsibility? Is it the teacher's responsibility to teach the subject of media arts in a virtual classroom or an inclusive school?

1.1 Educational integration for media literacy

Educational integration for media literacy generally involves linking the concepts of different educational fields such as art, technology and social inclusion, prioritizing the interaction of teachers/artists and students through the educational process. It also includes the use of information and communication technologies (ICT) and media literacy, both in the educational virtuality and in the creation of artistic materials — digital art, graphic art, video art, video poetry, etc. — in the virtual classroom. The aim is to create new educational ways by supporting complementary activities, both technological education and artistic education to transform the subject of artistic virtuality or artistic technology. Freire proposes using new techniques and impacts of media literacy such as ICT interdisciplinary methodology and media arts to reinforce new educational *praxis* in different virtual/face-to-face classes, especially for students with cultural diversity. It is important to reflect on the social and educational development of ICT in Freiranian thought:

> [...] the future of this new model [for artistic education and technological education] will modernize the structured programs, depending on the needs of its potentialities and scope of artistic technology to get social transformations and changes in inclusive communication, i.e., to incorporate the creative, social, (inter)cultural and strategic skills on their own computers/devices. (Bernaschina, 2019, p. 50)

Currently, the inclusion of media arts in education is not adequately addressed in terms of its impact on social education. Santos and Nauter de Mira (2020) mention the importance of comparing Freirean thought as popular education (or community education), and they say that it is constituted by community participation to create an institutionalization bridge of knowledge, hence transforming multicultural space through knowledge (social educators) and inclusive (literacy teachers, intercultural, cultural diversity, functional diversity, etc.). On the other hand, social education is constituted in social inequality, allowing the human being to rediscover himself as the creator of his experience, distancing himself from his lived world, problematizing it and

decoding it critically (Gil and Cortez Morales, 2018, p. 25). Therefore, it is important to improve the school system through the educational demands for art and cultural space associated with equality, equity, and quality of strategic learning for all students in the virtual classroom.

1.2 Social pedagogy towards educational inclusion and the virtual classroom

Social pedagogy is understood as the theoretical-practical science of social education of individuals, groups, communities, and society (Martínez-Otero Pérez, 2021, p. 3). In this context, educational inclusion is sought and methodologies for multicultural and multilingual education are used, as well as media arts activities in the field of social education. There "modernity aims to increase progress that entails elevating the human being and in which freedom and responsibility are responsible for building the social foundation" (Chesney Lawrence, 2008, p. 72). On the other hand, Pallarès Piquer (2014) argues "the science of art for transmitting knowledge in a didactic-educational process in which object and subject are reviewed and where the idea that the human is the person who is educated" (p. 66).

On the other hand, critical (or post-critical) pedagogy has generated a debatable dialogue regarding ICT and media. For this reason, the creation and use of technologies are necessary to understand and explain the human mind in its complexity (Rodríguez Arocho, 2018, p. 2). It also recognizes the importance of digital and technological literacy in transforming media culture. Freire (2007) stresses the need to analyze and propose social and cultural literacy:

> The active role of man *in* and *with* his reality. [...] Culture as the contribution that man makes to the world that he could not make. Culture as the result of his work, and his creative and recreational effort. [...] Culture as a systematic acquisition of human experience, as an incorporation of that critical and creative thought [...]. (p. 105)

Critical literacy and the practical-educational effort of Freirean theory of thought is not an easy task. However, "Freire Method" has allowed to address the challenges of educational literacy using ICT and media culture (Gadotti, 2006;

Gaitán Riveros, 2003; López, 2008; Morales Bonilla, 2018; Rondón Herrera and Pá Martínez, 2018; Trejo Catalán, Avendaño Porras and Pano Fuentes, 2018). Although there are no definitive educational responses to address the diverse demands of the complementary subject of media arts, media literacy is essential to adapt and train in the use of new technologies, technological art proposals and innovative educational tools necessary for methodological development and educational innovation through virtual environments. In this context of social pedagogy, it is possible to rethink the educational response around ICT and the incorporation of Freirean thought (Area Moreira, 2008; Cornejo Valderrama, 2017; Granda Asencio *et al.*, 2019; López Melero, 2012; Martos and Martos García, 2014; Verdeja Muñiz, 2016, 2019).

Our goal is to apply Freire's analytical method and the media arts to improve school education and promote educational and social inclusion in schools, through innovative educational programs, and a collaborative and respectful learning environment that values cultural diversity and equal opportunities for all students. In addition, it seeks to incorporate the new educational strategies based on Freirean thought within the complementary subject, adapting them to the learning process, creativity, and the use of ICT in the framework of inclusive education.

2. Theoretical foundations of Freirean thought (analytical methodology)

Freirean thought approach focuses on the socio-educational relationship in education, including the transmission of knowledge in the fields of pedagogy and social education (see figure 1). According to Úcar Martínez (2018a, 2018b), this educational interaction is based on professional *praxis*, the three axes (educational-relational/interactive-sociocultural), the development of sociability and sociocultural participation in different contexts.

This socio-educational field seeks to integrate the theory and practice of socio-educational development in various values such as autonomy, creativity, solidarity, flexibility, cooperation, tolerance, commitment, effort, equity, responsibility, work, debate, trust, incorporation, dialogue, and motivation. In addition, professionals from various areas or ICT facilitators who use critical pedagogy and media

literacy can be incorporated to spread Freiranian thought:

> Today, [...], information flows between fingers and moves through them, on screens of phones, televisions, social networks. Information spreads surprisingly fast, and new and increasingly sophisticated technological and media resources are involved daily. The complexity and diffusion of information [...] increasingly allow for the instantaneous sharing of videos, texts, images, sounds, messages, data and information. All these ways of reading the world place individuals in the contemporary world and demand an active and critical attitude towards digital technologies and mass media. (Jackiw and Haracemiv, 2021, p. 2)

Figure 1. *Conceptual map on the socio-educational relationship*
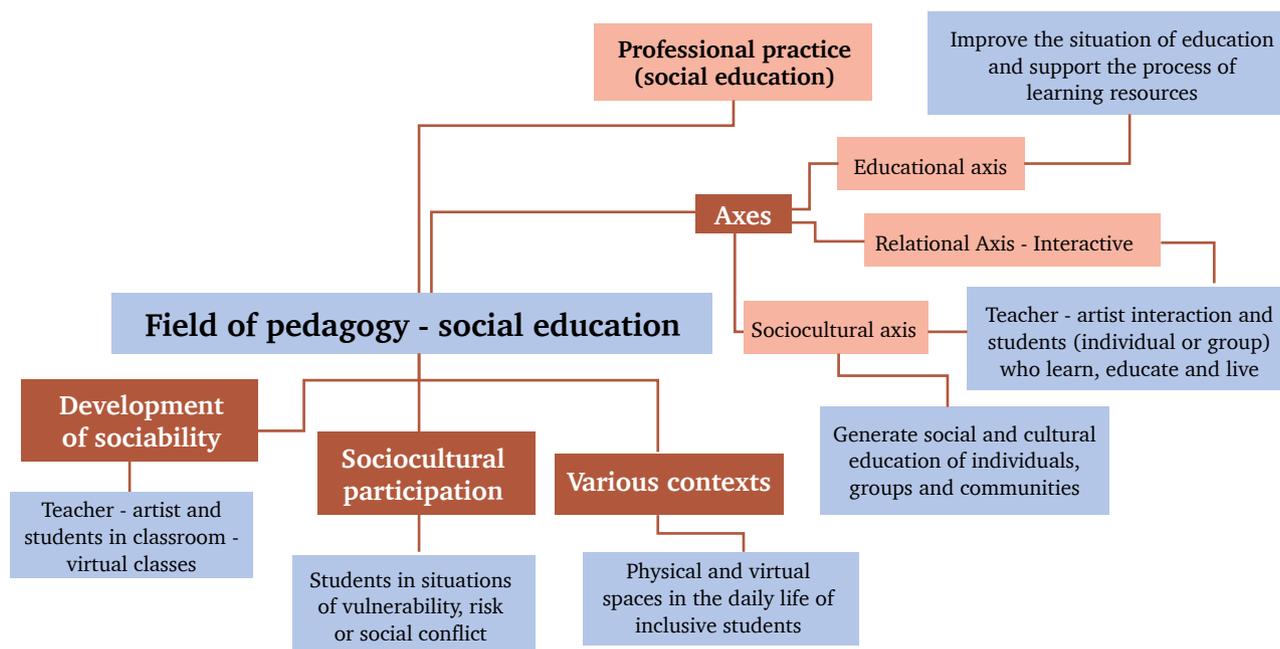
Note. Adapted by Úcar Martínez (2018a, 2018b).

Today, technology and media are crucial to the constant and rapid flow of information. These resources are constantly evolving, which requires a critical and active attitude of individuals in their use and consumption of the information they receive. The theoretical basis of Freirean thought emphasizes the importance of analytical methodology to foster critical awareness and liberation of individuals. New cultures of communication bring new knowledge to society both in terms of "technical" and "cultural" aspects (Graviz, 2010, p. 100). Therefore, inclusive education seeks to ensure a quality education for all students by considering their individual needs, such as participation in the use of computer tools, social sensitivity, motivation through the acquisition of values and the promotion of critical thinking (Adell Segura *et al.*, 2019; Echeita Sarrionandia, 2017; Núñez-Flores and Llorent, 2022; Ochoa Cervantes, 2019; Sotelino Losada *et al.,* 2022; Polanco Padron *et al.*, 2021).

2.1 Problem of digital/media literacy in critical pedagogy

Digital/media literacy is essential in critical pedagogy. To analyze the socio-educational practice related to ICT and the medial arts it is important to consider both *educational praxis* and pedagogical knowledge, which allows planning and reflecting through instruments or strategies. According to several authors (Guioti, 2007; Guioti and Quintana Albalat, 2006; Quintana Albalat and Bo Barnadas, 2016), the educational subject of ICT and its integration in different socio-educational and sociocul-

tural approaches presents differences in the use of educational accessibility, depending on the levels or curricular areas, towards a social commitment (good ethics, sustainable life, social responsibility, without discrimination, zero tolerance, etc.). The acquisition of knowledge through audiovisual technologies (media arts education) and electronic technologies (technology education) should foster acceptance and empowerment within the curricular integration for education (see Figure 2).

According to this figure, the idea is to support the use of teaching materials and resources for the teaching and learning of media art, considering the corresponding stage and inclusive participation for all students. Socio-educational and socio-cultural development is also integrated through ICT, as well as the pedagogy of autonomy (Freire, 1999; Malagón and Rincón, 2018), which emphasizes "the importance of theoretical knowledge, the need to put it in context and that *praxis* be permanently involved on critical reflection and ethics" (Sierra Nieto and Vila Merino, 2021, p. 2).

Figure 2. *Different groups related to ICT and socio-educational-sociocultural strategies*
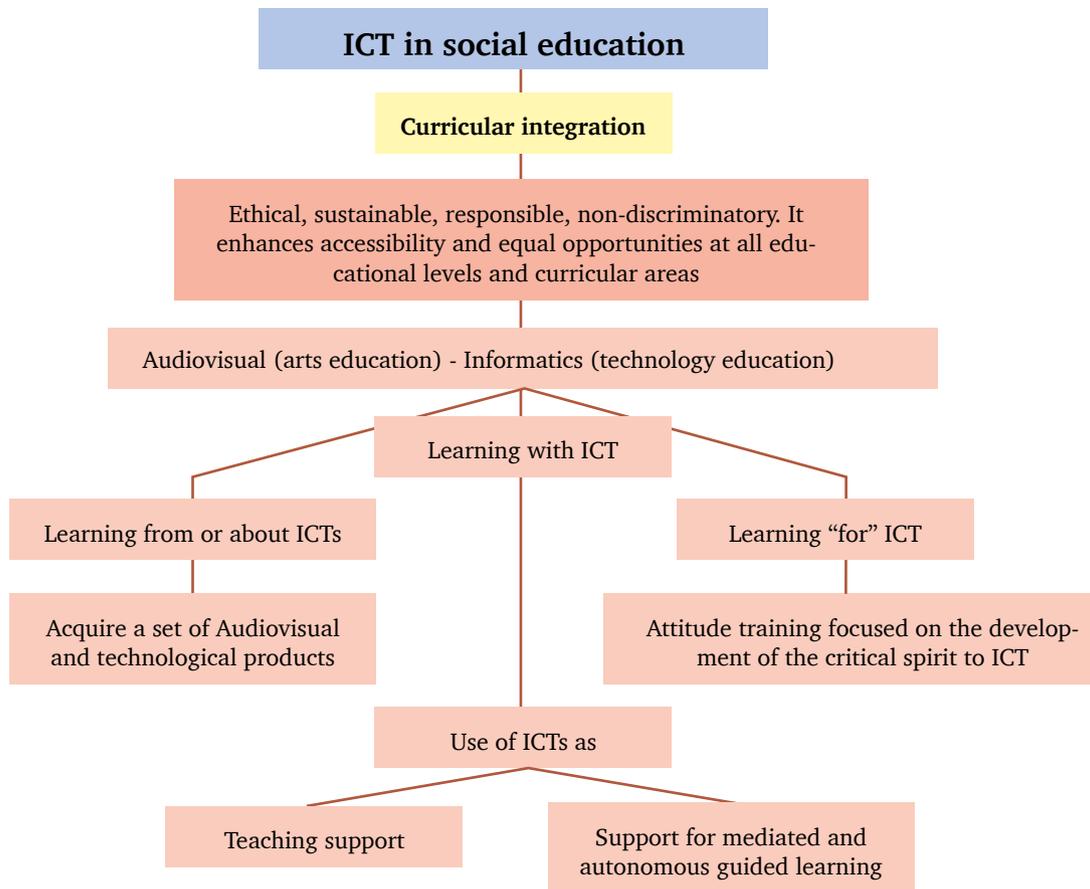
In fact, it is possible to improve the teaching and learning process of ICT by analyzing the instability in certain specific characteristics of teachers and artists, as well as schools, questioning the roles and functions of teacher trainers and artists, especially in situations of routine and discomfort, which can lead to rethink tasks and learn from the new; in other words, any instability or action involving the new and unknown requires new learning and a new reflection (Guioti, 2007; Guioti and Quintana Albalat, 2006; Quintana Albalat and Bo Barnadas, 2016; Terzi; *et al,* 2020). However, the teaching and learning capacity for social education can be established by studying stability and instability in the

media arts, which synthesizes the preliminary results of Freirean thinking (see figure 3).

According to Malagón and Rincón (2018), teaching has several requirements, one of which is recognizing cultural identity through the educational practice of critical pedagogy. This practice involves promoting critical thinking and allowing metacognitive exercises, exchange and dialogue about learning as a source of understanding teaching. Another requirement is respect for the autonomy of teacher/artist training. In this sense, the teacher/artist must have the ability not to direct the thought of students towards their own convictions, but to contribute to the awareness of students to their reality. In addition, curiosity is required to propose teacher/artist training in the virtual classroom. To characterize Freirean teaching, elements such as security, professional competence and generosity are needed to perform the task, freedom, and dialogue through the commitment of Freirean teaching.

Figure 3. *Conceptual map on the educational process of Freirean thought*
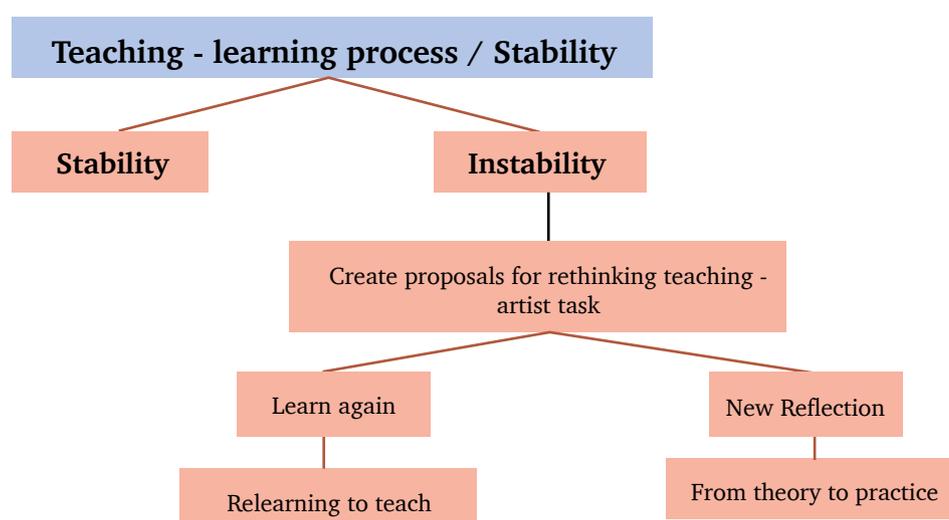
2.2 Analysis of Media Arts for School Students in Critical Pedagogy

Media arts (Bernaschina, 2019, 2020, 2021) as a subject seeks to deepen the use of teaching and digital resources in the educational process of teaching and learning in the virtual classroom. However, not all inclusive schools allow students to optimize their interdisciplinary learning through media literacy and art technology in virtual environments. It is important to analyze the educational areas that support the subject of media arts and social education to encourage the participation of inclusive students. Some authors suggest that interdisciplinary methodology with a high level of interpersonal interaction and teamwork is key in the learning process (Guioti, 2007; Guioti and Quintana Albalat, 2006; Quintana Albalat and Bo Barnadas,

2016). Therefore, it is possible to promote students' autonomy through Freirianian thought:

> This means that the individuals [(students)] are accompanied in the process, they learn from their experience, reflect on the context of oppression and see the oppressor [(teacher/artist)] inside of them, as Freire argues; but more importantly, they must recognize the possibility to choose the change that involves reflecting on their own life. (Carballo Villagra, 2008, pp. 24-25)

This experience implies recognizing the participation of the educational process in the teaching of the oppressor and the learning of the subject, generating a school interaction between teachers/artists and students to achieve a positive/negative change in critical pedagogy.

3. Proposal on the educational integration of the virtual and the social

The proposal of virtual-social educational integration seeks to improve education by effectively incorporating online learning and social interactions through digital technologies and online resources, fostering collaboration and knowledge exchange between students and educators, creating student autonomy and the subject of media arts to develop social, technological and artistic skills (Bernaschina, 2019; Daniels, 2003; Latorre and Seco del Pozo, 2013; Pallarès Piquer, 2014; Torres, 2006; Vygotsky, 1995, 2006 9; Wertsch, 1988). In order to address the problems related with Freirean theory of thought, the following is proposed:

> Inclusive educational practices with ICT allow to include *software* programs such as the technological didactic resource (computer, laptop, cell phone, tablet, camera, etc.), to ensure more interdisciplinary activity that allows to offer the functioning of meaningful learning (from the American psychologist, David Ausubel) and collaborative learning (or the educational interaction, better known as ZDP, Zone proximal Development, a concept created by the Russian psychologist Lev Vygotsky to solve a problem of creativity, and to share the social relationships of users (inclusive students) through ICT in the media arts. (Bernaschina, 2019, p. 145)

For this, the analytical methodology must be developed and implemented by some ideas of the teacher/artist to make the works and such activities independent within the *praxis* of media arts to transform media literacy. It is important to emphasize that this structure is deepened through the human participation of students, through "dialogic learning"[1] in virtual environments for the school educational community. This approach aligns with the practice of pedagogical interaction, represented by the "pedagogical triangle",[2] and promotes a "free learning" that claims criticism in favor of the theory of dialogic action (Bernaschina, 2019, 2020, 2021; Freire, 2005).

To achieve this change in educational practice, it is necessary to incorporate the *praxis* of virtual teaching and media literacy, which will support and strengthen "cognitive tools" (Aparicio Gómez, 2018) to complement the problem-based learning capacity of ICT and digital/media literacy, both for teachers/artists and inclusive students.

3.1 Critical literacy and media literacy dilemma

This dilemma is in some functions of critical literacy, according to Pallarès Piquer (2014), which defends Freirean thought to liberate knowledge of the production and use of the media. This characteristic of Freirean literacy allows dialogue and collaboration in pedagogical interaction, depending on the two models, both the traditional classroom (teacher-student-content) and the virtual classroom (teacher/artist-inclusive students-media arts) to socialize these educational activities (Bernaschina, 2019, 2020, 2021).

For example, for Freire (2005), communication involves the transmission of a coded message through various channels, which vary depending on the educational material (photographs, slides, films, posters, reading texts, among others). Thus, it is discussed as the educational model for media literacy, which seeks to provide the use of complementary materials for media arts education in the virtual classroom.

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[1] Some keys to dialogic learning in ICT are important to promote educational *praxis* that encourage the search for knowledge in virtual environments, while respecting diversity. It is necessary to question the understanding of educational *software* as a basic tool and, instead, promote the development of creativity and strategy to foster the educational transformation process.

[2] The pedagogical triangle, also known as pedagogical interaction, refers to the educational relationship between the teacher, the students and the contents. In addition, it includes virtual interaction between the teacher/artist, digital content and inclusive students. These two axes represent different areas of competences, didactic resources and educational processes in the classroom, which can be strategic or creative. Importantly, not all schools use these educational axes.

3.2 New relationship on critical pedagogy towards the field of media literacy

The new relationship between critical pedagogy and media literacy focuses on incorporating interaction in the educational process of inclusive school and the media arts for students with cultural diversity. This practice of critical literacy seeks to teach technological learning and virtuality within the Freirean educational field, using methods such as pedagogical interaction for free learning. For example, critical literacy seeks to encourage inclusion and active participation of students in their own learning process, as described by Freire in his pedagogical method:

> The important thing, from the point of view of liberating education is that, in any case, men feel the owners of their thinking, discussing their own [...] world view, manifested implicitly or explicitly in their suggestions and those of their colleagues, because this vision of education is based on the conviction that it must be sought dialogically with the people, and is necessarily inscribed as an introduction to the Pedagogy of the Oppressed, hence he must participate in his elaboration. (Freire, 2005, p. 158)

Thus, liberating education facilitates the incorporation of Freirean thought into the pedagogical system, through school interaction in artistic and social virtuality. This avoids the contradiction of *teacher/artist in situations of low school performance or failure of learning ICT or media arts subjects.*

Teacher/artist professionals should help students to learn the concepts of educational *software* and the didactic tools of this subject. Freirean thought considers traditional education to be harmful to students without literacy skills in an oppressive environment with excessive tools of artistic or digital work, leading to lack of motivation and interest in ICT. Dialogue between literacy and media literacy in the educational system needs to be promoted to improve understanding of media arts content.

3.3 Contributions of critical pedagogy in the field of media literacy

The intention of critical pedagogy is to foster dialogue and improve online education through flexible and creative teaching adapted to the needs of students, no matter their cultural background or socio-economic situation. It also seeks to foster democratic learning. In this sense, the first three figures of the theoretical foundations of Freirean thought can contribute to improve media literacy in the virtual classroom.

The subject of the media arts along with Freirean thought can promote an argumentative analysis of Freire's critical literacy and its relationship with inclusive education in school. To perform this analysis, a structure that starts from general to specific can be used with some reflections that allow deepening in this topic (see figure 4).

Figure 4. *Different groups of Freirean thought and the subject of medial arts*
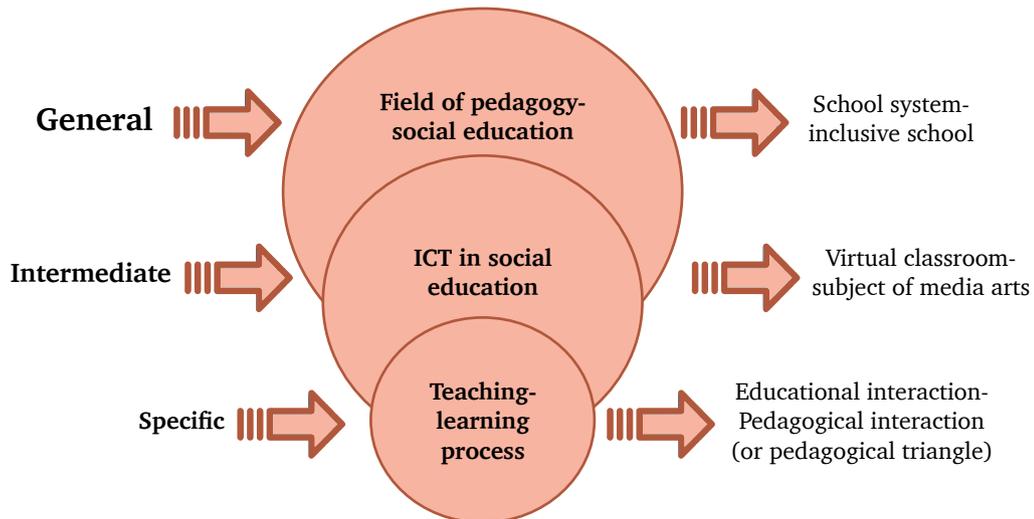
In the field of media literacy, critical pedagogy defends the idea that the school should promote the inclusive participation of students, as Freire conceived of education, to promote individual and community growth within the educational community. A school is where educators are free to choose their own pedagogical approaches, engage in critical thinking, select programs and methods that suit their needs and understand their community" (Morris, 1998, p. 63). Not all inclusive schools facilitate direct observation of students in the virtual classroom, but the need to improve the strategy of the educational process, especially in vocational training.

Freirean thought implies establishing a link between culture and the arts for the media literacy program, incorporating both theory and educational practice. According to Freire, arts and education are a cultural community action for freedom. Therefore, it is important to create artistic-media projects with free topics within the educational system, supporting Freire's theory and addressing the questions, values, concepts and hopes that characterize the obstacles that prevent students from learning.

However, it is necessary to support the subject of media arts and media literacy, integrating Freirean thought. Gil and Cortez Morales (2018) highlight the autonomy provided by Freire to meet the new formative demands of educators, and artists. This educational perspective seeks to improve the teaching dialogue and the educational system to achieve a liberating transformation. The liberating pedagogy is based on:

> Any educational, liberating practice that values the exercise of will, decision, resistance, desires, limits, the importance of consciousness in history, the ethical sense of the human presence in the world, the understanding of history as a possibility is substantially positive and, therefore, generates hope. (Freire, 2012, pp. 56-57)

Therefore, it is important to propose a "social-cultural hope of inclusive education" (Caparrós Martín and García García, 2021; Caride Gómez, 2021; Ferreira Galli and Marini Braga, 2017; González-Monteagudo *et al.*, 2021) to achieve coherence and transform "educational hopelessness", which implies "the lack of problematizing a reality of injustice and inequity" (Malagón and Rincón, 2018, p. 117). In fact, the importance of having more awa-reness of problematizing or questioning the reality of the teacher/artist in the context of the educational virtuality towards social inclusion.

4. Conclusions

Freire's analytical methodology reinforces the need to teach media arts as a complementary subject through the integration of arts and technology at all school levels. This will improve digital literacy, especially in the most vulnerable learners, and address cultural diversity, facilitating access to ICT to motivate participation and remove social barriers related to media literacy.

Therefore, this conclusion is based on critical pedagogy and analytical methodology to integrate Freirean theory and thought in the training of teachers and artists. This is essential to address the human nature of the school learning process, and to provide teaching resources to illiterate students, as well as to develop teaching proposals and creative methods that encourage virtual participation in inclusive school. In addition, it is essential to improve the integration of Freire's critical literacy and media literacy into the teaching of the media arts, which requires adequate professional training for teachers and artists using ICT teaching resources in the virtual classroom. Culture, education, technology, and art are fundamental criteria for investigating the school experience and building the future of the social school:

- Prioritize the elimination of barriers to achieve socio-educational supports that allow incorporating pedagogical interaction in the teaching of the media arts by linking critical pedagogy and educational integration for media literacy.
- Enable the transformative creativity of media literacy in different groups of Freirianian thought and in the teaching of media arts, which implies the need for strategies that involve new content and teaching resources for teachers and artists in the virtual classroom.
- Promote educational interactions to contextualize the experience capacity of cognitive tools, and strengthen *praxis* in different areas of art education and technological education.

These criteria offer a small guide to analyze and investigate various fields, including the social and technological context of complementary teaching of media arts. It is essential to improve the capacity of *praxis* through dialogue and virtual education to create new social, student and educational experiences.

Finally, it is proposed to open a debate to reflect on the training of teachers and artists for the "virtual school", interacting with inclusive students from different cultures to create artistic works and promote independence in media arts activities. Therefore, it is important to consider the criteria proposed by Freire to achieve an effective integration of the educational work of teachers and artists in the educational system, as well as to guarantee the inclusion of all students in the virtual learning environment. In doing so, it will promote fairer and more equitable education, recognizing and valuing the various forms of knowledge and fostering a culture of active and critical participation in society.

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Inclusive competence in teaching practice: bibliometric analysis and categorization proposal

Competencia inclusiva en la práctica docente: análisis bibliográfico y propuesta de categorización

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Abstract

Inclusive education is an essential component of regular education, which implies that teachers attend to diversity in their classrooms, therefore, it is expected that they are prepared to exercise their profession in an adequate manner.

In order to know which competencies are necessary to serve students with Special Educational Needs, the objective of this research is to propose a theoretical categorization of the most relevant competencies through teaching practices by means of a review of tested instruments.

To achieve this objective, a review of 24 quantitative studies assessing the competencies, perception and inclusive practices of teachers in various countries was carried out. For the selection of the instruments, certain selection criteria were established, such as keywords, year of publication, reliability index (Cronbach's Alpha) and studies with factor analysis, to ensure the quality and validity of the construct.

From the instruments analyzed, 18 tools with 87 different dimensions were identified, which were classified and conceptually categorized into five main dimensions: Pedagogical process, Inclusive practices, Collaborative work, Attitude and values, and Professional development. These categories contemplate the inclusive competencies that it is considered that teachers should possess in their professional practice.

Keywords: inclusive education, teacher competencies, questionnaire, teacher training, educational needs

Resumen

La educación inclusiva es un componente esencial de la educación regular, que implica que los docentes atiendan a la diversidad en sus aulas, por lo tanto, se espera que estén preparados para ejercer su profesión de manera adecuada. Para conocer cuáles son las competencias necesarias para atender a estudiantes con Necesidades Educativas Especiales, el objetivo de esta investigación es proponer una categorización teórica de las competencias más relevantes a través de las prácticas docentes por medio de una revisión de instrumentos probados. Para lograr este objetivo, se llevó a cabo una revisión de 24 estudios cuantitativos que evalúan las competencias, la percepción y las prácticas inclusivas de los docentes en diversos países. Para la selección de los instrumentos, se establecieron ciertos criterios de selección, como palabras clave, año de publicación, índice de confiabilidad (Alpha de Cronbach) y estudios con análisis factorial, para garantizar la calidad y validez del constructo. A partir de los instrumentos analizados, se identificaron 18 herramientas con 87 diferentes dimensiones, que fueron clasificadas y categorizadas conceptualmente en cinco dimensiones principales: Proceso pedagógico, Prácticas inclusivas, Trabajo colaborativo, Actitud y valores y Desarrollo profesional. Estas categorías contemplan las competencias inclusivas que se considera que deberían poseer los docentes en su práctica profesional.

Palabras clave: educación inclusiva, competencias del docente, cuestionario, formación de docentes, necesidades educativas.

1. Introduction

Education, as a fundamental right recognized by UNESCO (2008), considers inclusive education an essential part of the educational practice to guarantee that all students have access to equitable and quality education, regardless of their abilities, needs or individual characteristics and can participate fully in school life, without segregation, i.e., it seeks to ensure equal opportunities for all students at all education levels (Calvo, 2013; Echeita, 2012).

Inclusive education requires creating a high-quality learning environment that minimizes the barriers that students may face in the education system, while recognizing individual differences (Ainscow and Miles, 2008).

For Blanco (2009), the creation of these spaces not only benefits students who are in difficulty but all, as it fosters the cohesion and integration of the group. Barriers can be reduced, and learning facilitated by identifying the needs present in the classroom, especially if adopting the measures from the Universal Design for Learning (hereinafter UDA) (Alba-Pastor et al., 2014). In this approach, the teacher is more flexible when planning the objectives, considering the methodology, resources and evaluation of all students, even those who had not initially considered themselves as subjects with needs. In this way, the actions and skills applied by teachers become tools to strengthen learning in a particular way and generate more inclusive environments (Center for Applied Special Technology [CAST], 2013).

For Booth and Ainscow (2011), inclusive education is a concept transversally present in all social, school and family environments, which is defined as a process that seeks to increase the participation of students, both in the curriculum and in school and cultural communities, while working to reduce exclusion in these areas. The latter can be achieved when one begins to recognize individual differences and needs regarding how each person learns, relates and interacts (Gimeno Sacristan et al., 2011).

According to the authors, it is important to guarantee full inclusion in which education provides all students with inclusive processes, especially children and young people with special educational needs (hereinafter SEN) that can be temporary or permanent, in which they have equal opportunity to develop without discrimination to learn together with their peers (Dios et al., 2018; Verdugo Alonso et al., 2018).

There have been advances in relation to educational inclusion and the increase and participation of several actors involved in these processes, which have resulted in a significant increase in students with SEN in schools and greater relevance compared to regular education, although it continues being a challenge for education in general (Eslava Suanes et al., 2015).

Teachers are a fundamental part of this inclusion process and changes, since they are responsible for reducing the barriers that limit access to knowledge and must carry out innovative actions for students to achieve the established curricular objectives (Royo Peña et al., 2019). To this end, they will be prepared not only with theoretical knowledge, which is an important part of their training, but also with aspects and competences that complement their profile and enrich their teaching practice, allowing them to take action against educational inclusion when teaching (Juárez Romero et al., 2018).

Therefore, these competencies will be key in the teacher to carry out inclusive practices to create learning environments in which he promotes the participation and success of all students, regardless of their personal characteristics (Herrera et al., 2018). This implies the incorporation of a combination of skills, knowledge, motivation, values, attitudes that allow to achieve effective action and constitutes an essential component in the professional practice (García Ferrandis et al., 2021).

In this sense, it is necessary to know about the SEN and inclusive regulations to guarantee and respect their rights and learning rhythms to maximize it and ensure the participation of all students (Dios et al., 2018; Román-Meléndez et al., 2021).

The mastery of these skills is considered as the competence framed in the professional field. According to Fortea (2019), teachers require specific skills that relate directly to the subject areas of their profession, allowing people to prepare themselves with the scientific and technical foundations for future life.

Therefore, the ability to carry out inclusive processes requires a solid and broad pedagogical training, as indicated by Amaro Agudo et al. (2019), which involves deploying actions in their performance and professional development. Among these, the

implementation of teaching resources and strategies in environments of solidarity and democratic participation with all students, flexibility and adaptation of the curriculum and innovation of the teaching practice that relate the information to essential situations of life, also the creation of environments for professional collaboration and teamwork (García-González *et al.*, 2018; Gimeno Sacristan *et al.*, 2011).

In this sense, De Haro *et al.* (2020) and García-González *et al.* (2018) point out important aspects as a basis for inclusive education, which consider the adaptation of curricular objectives and the modification of students' learning styles (Kuyini *et al.*, 2021).

For their part, Deng *et al.* (2017) mention the ability of teachers to attend SEN in ordinary classrooms, which highlights the teaching process, communication, cooperation, attitudes and beliefs and reflection as fundamental areas of this competence (Colmenero and Pegalajar, 2015; Dios *et al.*, 2018).

According to İlik and Sarı (2017), another important element present in inclusive teaching is the ability to assess students' "knowledge, skills, techniques, attitudes and values" (Moreno Olivos, 2021, p. 225), which requires teachers to prepare and implement strategies that fit their students' needs.

In this sense, Alquraini and Rao (2018) mention the importance of continuous training required by teachers to keep up with advances in the field of education and continue improving their teaching practice to provide equal education to all (Burke and Whitty, 2018).

Thus, the competent teacher in the inclusive field will be the one who is ready to adequately prepare all students in an effective and comprehensive way and can manage the classroom according to the particular needs (Sáenz De Jubera Ocón and Chocaro De Luis, 2019), ensuring that learning experiences allow students to develop more efficiently in life.

Finally, these approaches that guide inclusive competence in teachers align with the model of inclusive pedagogy, as Florian (2012) indicates, which promotes a broad view of the learning potential of all students.

Therefore, this research aims to contribute with the review of the most important dimensions in the literature on inclusive competence of teachers in their educational practice, in order to propose a categorization that allows defining the essential components for their professional development.

2. Methodology

A documentary bibliographic analysis was conducted to carry out this study (Clauso, 1993), which consisted of reviewing in detail the contents of different previously validated tools, to obtain accurate information and present them (Arnaiz and Guirao, 2015; Luna and Reyes, 2015). It has a descriptive approach (Gómez Vargas *et al.*, 2015), which details the review process and the results of the dimensions obtained on inclusive competence evaluated in teachers in the academic field of different countries.

Specifically, 24 quantitative studies on tools to assess the competencies, perception and inclusive practices of teachers in different countries were selected. Qualitative studies were excluded because they did not explicitly meet the selection criteria proposed for the research.

The conceptual categorization level of the factors found was performed, based on the similarity of the theoretical content of each tool based on the three phases according to what Bernete (2013) states.

1. Data collection: instruments were selected under certain criteria:

- Keywords of the UNESCO Thesaurus, in both Spanish and English: inclusive education, teacher competencies, factor analysis, educational needs, questionnaire, training, teacher.
- Publications of the last ten years (2012-2022).
- Factorial, exploratory or confirmatory analysis.
- Reliability index (Cronbach's Alpha).

For selecting these instruments, articles were chosen from journals indexed with a high impact factor, because they have a higher frequency of reference and are included in some more relevant databases at the scientific level.

As indicated, for the selection of tools, the reliability index (Cronbach's Alpha) and exploratory factor analysis (EFA, henceforth) or confirmatory factor analysis (CFA, henceforth) were considered to know the validity of the construct (Braun *et al.*, 2012).

2. Data extraction: information was recorded for each instrument (Table 1). Thus, 18 studies with factor analysis were taken into account and six that do not have factor analysis were not included in the categorization, however, they were included in the literature review.

Table 1. *Instruments analyzed: Inclusive competition*

Questionnaire Author Country	Journal	Database	Analysis	N	α	Type of questionnaire
PCITS (Kuyini *et al.,* 2021) Botswana	International Journal of Inclusive Education Q1	WOS	AFE	116	0.91	Teaching competencies
TALIS 2018, (Lopes y Oliveira, 2021) Portugal	Education Sciences Q2	Scopus	AFC	2544	0.84	Inclusive teaching practices
CPCH (Chan y Luk, 2021) China-Hong Kong	Assessment y Evaluation in Higher Education Q1	EBSCOHost	AFE	2192	0.72	Teaching competencies
ESAPD (Polo Sánchez *et al.,* 2021) España	Anales de psicología Q2	EBSCOHost	AFE	82	0.92	Inclusive teaching practices
SE-PETE-R - (Kudláček *et al.,* 2020) República Checa	International Journal of Inclusive Education Q1	WOS	AFE AFC	200	0.92	Inclusive teaching practices
CEINCLUSIVA - (De Haro Rodríguez *et al.*, 2020) Colombia	Revista electrónica interuniversitaria de formación del profesorado Q3	Scopus	AFE AFC	158	0.96	Teaching competencies
CEFI-R (Rodríguez Macayo *et al.,* 2020) Chile	Foro Educacional	WOS	AFE	497	0.85	Inclusive teaching practices
CEFI-R (González-Gil *et al.,* 2019) España	Revista Aula Abierta Q3	WOS	AFE	202	0.89	Teaching competencies
PTPIAS (Walker y Laing, 2019) Australia	e-Journal of Business Education y Scholarship of Teaching	EBSCOHost	AFE	326	0.914	Inclusive teaching practices
CPDIADPS (Colmenero *et al.,* 2019) España	Cultura y Educación Q1	WOS	AFE	428	0.98	Inclusive teaching practices
CEPIPEE (Alquraini y Rao, 2018) Arabia Saudita	International Journal of Disability, Development and Education Q2	EBSCOHost	AFE AFC	179	0.95	Teaching competencies
ESCOD (Dios *et al.,* 2018) España	Revista Mexicana de Investigación Educativa Q2	Scopus	AFE AFC	1495	0.95	Teaching competencies
#ICOMpri3 (Calderón *et al.,* 2018) España	Estudios sobre Educación Q3	ProQuest	AFE	335	0.89	Teaching competencies

Cuestionario Autor País	Revista Cuartil	Base de Datos	Análisis	N	α	Tipo de cuestionario
CEFI-R (González-Gil *et al.,* 2017) España	Revista Aula Abierta Q3	Research-Gate	AFE	697	0.74	Teaching competencies
ITCQ (Deng *et al.,* 2017) China	International Journal of Inclusive Education Q1	WOS	AFE AFC	505	0.95	Teaching competencies
IEP (İlik y Sarı, 2017) Turquía	Educational Sciences: Theory y Practice Q3	EBSCOHost	AFE AFC	19 24	0.98	Teaching competencies
CFDES (Colmenero y Pegalajar, 2015) España	Estudios Sobre Educación Q3	EBSCOHost	AFE	90	0.92	Inclusive teaching practices
CECD (Luna y Reyes, 2015) México	Revista Electrónica de Investigación Educativa Q2	EBSCOHost	AFE	128 791	0.98	Teaching competencies

Finally, the identified dimensions were classified and categorized, assigning codes according to their respective definitions. To select them, first, the results of the studies were reviewed and, later, the indicators proposed by each tool were analyzed. This process allowed identifying common factors, discarding repetitions and selecting those that are most relevant to inclusive competition.

3. Data exploitation: the punctuation and writing of the text were edited, the content was analyzed through the analysis of word frequency, topics and semantic networks to find patterns and trends in the content to improve the results.

3. Results

The results allowed to determine the categorization of the dimensions that include inclusive competition according to the reviewed literature.

These studies have factor analysis with a very good reliability index in their Cronbach alpha coefficient (Tavakol and Dennick, 2011).

A total of 87 dimensions were found that were conceptually classified and categorized into 12 categories with common theme, covering the five established competencies (Arnau Sabatés and Sala Roca, 2020) (Table 2).

Table 2. *Classification of dimensions in studies*

Dimension	Category
D1. Pedagogical process dimension	Didactics / Methodology / Curriculum / Assessment
D2. Inclusive practices dimension	Adaptations / Inclusion
D3. Collaborative work dimension	Peer work / Collaborative work
D4. Attitude and values dimension	Values / Leadership / Behavioral problems
D5. Professional development dimension	Training

Pedagogical process dimension: as for pedagogical competence, it includes aspects related to those teaching and learning processes that are organized

in a conscious way and are aimed at the training of students, including the design and development of a curriculum, didactic planning, methodological and

evaluation strategies (Amaro Agudo *et al.,* 2019; İlik and Sarı, 2017; Sierra Salcedo, 2007).

Inclusive practices dimension: the competence of inclusive practices considers the adaptations, resources and supports of the teacher in the educational process. It recognizes the strategies and resources that can be used as the implementation of the UDA (Alba-Pastor *et al.,* 2014). It also implies knowing which students should work together and the moment in which the professor should provide such support from an educational policy perspective (Fischer *et al.,* 2018).

Collaborative work dimension: this collaborative work dimension sets out specific strategies as suggested by Kudláček *et al.* (2020) for working as a team, reflects aspects of teacher participation as part of the community and integrates inclusive actions that provide information on the degree of collaboration and interaction that both students and teachers have in the teaching-learning process in different environments (Hernández-Ayala and Tobón-Tobón, 2016; Sagredo-Lillo *et al.,* 2020).

Attitude and values dimension: the attitudinal dimension recognizes the actions that occur in the framework of the teacher's ability to act in different situations, contexts and with respect to others. It is based on their ability to solve problems about processes related to diversity (Ainscow, 2015; García Ferrandis *et al.,* 2021).

Professional development dimension: the professional development dimension focuses on the lifelong and continuous training performed by teachers to improve their skills and knowledge, reflected in the ability to achieve effective learning by their students (Moreno Olivos, 2021). These processes include initial training, current and permanent self-training, which are necessary due to changes and requirements that arise throughout the professional career (Fischer *et al.,* 2018; Herreros López, 2017).

4. Discussion and conclusions

On the one hand, inclusive competence is contextualized in this theoretical categorization in the framework of generic competences, which result from the way of acting and proceeding in the daily basis, which involves the ability to learn, adapt and relate in different environments (Amaro Agudo *et al.,* 2019); on the other hand, in professional compe-

tences, which focus on the work of the teacher in the school environment.

Kantor *et al.* (2021) point out that it is essential that teachers, as part of their professional development, know about pedagogical processes in relation to the training and application of teaching methods and technologies adapted to the SEN of their students.

As mentioned by Alba-Pastor *et al.* (2014), the implementation of new teaching strategies and mastery of these resources require specialized skills and knowledge when applying UDA. In the same way, it also requires being prepared to carry out changes at the methodological, didactic, curricular level and conduct evaluations according to the needs of the group; therefore, the teacher is expected to be in constant training process (Furtado Nina *et al.,* 2020).

It should be mentioned that actions involving the development of inclusive practices should be a priority in the educational policy pursued by schools. This requires the support of a multidisciplinary team capable of identifying or detecting any need and developing innovative strategies to apply the curriculum through appropriate adaptations to students (González-Gil *et al.,* 2017).

Regarding the professional training of teachers, Calderón *et al.* (2018) and Deng *et al.* (2017), stress the importance of previous and ongoing training by teachers. The studies highlight that this aspect represents a weakness in the training profile, and also refer to the importance of institutional support for the professional development of teachers and improve their inclusive capacity, both individually and institutionally. Furthermore, studies emphasize the need for the educational institution to be directly involved in this process of development and support for teachers.

Other authors, such as Kuyini *et al.* (2021), agree that it is necessary to develop inclusive competence, based on the skills, attitudes and values of teachers in relation to the performance of inclusive and intercultural educational practices, teaching and learning styles, educational experiences and behavior management (Dios *et al.,* 2018; González-Gil *et al.,* 2017; Román-Meléndez*et al.,* 2021).

When analyzing the inclusive competences of teachers, it is important to orient the training and preparation of teachers to contribute with the inclusive culture of educational institutions.

It is also considered necessary to incorporate these competencies in the teacher training curriculum as an integral part of their professional practice, since it recognizes education as a driving force for change and can therefore be projected towards the formulation of proposals and programs as part of new educational policies.

In this regard, it is important to highlight the need to work together, between those responsible for teacher training and those responsible for education policy, to establish strategies that promote inclusion in education and improve the possibility of meeting the needs of all students, thus seeking to increase educational quality (Polo Sánchez *et al.*, 2021).

Finally, it is important to note that this research is based on a literature review of quantitative studies that address the dimensions of inclusive competition. However, it is suggested that research be expanded by including qualitative studies that enrich the theoretical scope and provide perspectives on practices related to inclusive competition. These qualitative studies can be considered as possible areas of work and future lines of research in the field of educational inclusion.

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The social and cultural context on literacy in High School

El contexto social y cultural en la lectoescritura de educación media superior

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Abstract

Reading and writing enable communication and interaction between people and the world. In the case of high school students, this activity is reflected in school performance and is essential for acquiring knowledge. When students have not developed this skill correctly, it becomes a problem that affects all their relational dimensions. For this reason, it was proposed to identify the main difficulties faced by students in relation to literacy codes in high school, as well as the context of production of the writings. The methodology was based on the exploratory qualitative approach, using the content analysis method. The information was obtained from one hundred documents written by twenty first-year high school students from a private institution in the State of Puebla.

The analysis and categorization of the writings was carried out with ATLAS.ti software, 9.0.7 version. The results shown in this paper are based on the analysis of three types of texts produced by the students: travelogue, essay, and anecdote paper. It is concluded that such literacy practices give proof of the abilities that define the communicative competences assimilated during school life, how they function and how students relate to society. This makes it possible to think about designing new teaching-learning strategies for literacy.

Keywords: literacy, education, handwriting instruction, communication, semantics, spelling.

Resumen

La lectoescritura posibilita la comunicación e interacción de las personas con el mundo. En el caso de estudiantes de educación media superior, esta actividad se refleja en el rendimiento escolar y es fundamental para adquirir otros aprendizajes. Cuando el estudiante no ha desarrollado correctamente esta habilidad, se convierte en un problema que afecta todas sus dimensiones relacionales. Por este motivo se planteó identificar las principales dificultades que enfrenta el alumnado en relación con los códigos de lectoescritura en educación media superior, así como el contexto de producción de los escritos. La metodología se basó en el enfoque cualitativo de carácter exploratorio, utilizando el método de análisis de contenido. La información se obtuvo mediante la recolección de 100 documentos elaborados por 20 estudiantes de primer año de educación media superior de una institución privada del Estado de Puebla.

El análisis y categorización de los escritos se realizó con el software ATLAS.ti versión 9.0.7. Los resultados que se muestran en este trabajo parten del análisis de tres textos de producción estudiantil: cuaderno de viaje, ensayo y anecdotario. Se concluye que las prácticas de lectoescritura muestran los rasgos que definen las competencias comunicativas asimiladas en el transcurso de la vida escolar, su funcionamiento y cómo se relacionan los y las estudiantes con la sociedad. Lo que permite reflexionar sobre el diseño de nuevas estrategias de enseñanza-aprendizaje de la lectoescritura.

Palabras clave: lectoescritura, educación, enseñanza de la escritura, comunicación, semántica, ortografía.

1. Introduction

Reading and writing involve reading and writing skills related to comprehension and expression levels (Romero and Lozano, 2010). Students involved in this process develop lexical, syntactic, semantic, or perceptual skills (Montealegre, 2006), which allow to identify the existence of linguistic, social and cultural know-how (Parra, 1991), reflected in their way of thinking and generating knowledge. Therefore, it is necessary to expand educational research. There are several studies focused on higher secondary education, some of general content and others focused on reading and writing, however, reading and writing skills have been neglected in high school students, since each school has specific programs that determine the specific competencies (Brand, 2017) and that influence the production of writings.

Most relevant studies that have analyzed reading and writing at different educational levels in Mexico refer to the problem of reading processes in basic education (Alfaro and Tejeda, 2010; Alpuche and Vega, 2014; Ferreiro, 2006). Research and proposals for solutions in high school are focused on strengthening reading skills. Márquez (2017) talks about reading, reading habits and the educational system. Similarly, Alarcón *et al.* (2009), reflect on the problems of reading in the Mexican high school and the factors that influence it. Rivero (2010), discusses the learning of Spanish at the high school level and analyzes the causes of why Mexican students are placed at the lowest level of achievement in the National Evaluation of Academic Achievement in Schools (ENLACE) test. Montoya (2017) studies the lack of reading comprehension, even comparing it with a disability, defining it as the inability to insert into society. Villalón and Mateos (2009) explore the conception of writing held by students of basic and higher education.

On the other hand, there are various pedagogical resources to speed up the teaching-learning process of reading and writing and ensure the decoding of the different linguistic codes in 21st century society (Anguera, 2008; Sergio, 2015; Caride, 2016; Carlino, 2013; Díaz Barriga, 2014; Díaz Barriga and Aguilar, 1998; Peña *et al.*, 2016). Hernández (2016) addresses the concept of academic literacy from the teaching-learning perspective, Castro and Sánchez (2018) focus on the development of argumentative skills in higher education.

Although reading, writing and mathematics are considered necessary conditions for school success since basic education (Ferreiro and Teberosky, 2013), the implementation of different methods to teach reading and writing remains as one of the most important challenges of the educational system. Students can read and write in high school, but there are cognitive and educational changes that have occurred in the transition of their school life at the basic level (Marín, 2006). Therefore, the aim of this research is to identify the main difficulties faced by students in relation to reading and writing codes in high school, as well as the context of writing production.

2. Methodology

An exploratory qualitative approach was used (Flick, 2015). The hermeneutic method was used to interpret the information collected (Jorge, 2006). The document content analysis technique and the classification technique of personal documents (Bardin, 1996; Kippendorff, 1990) were used to identify the main difficulties faced by students in relation to reading and writing codes as well as the production context of student texts, understood in this research as the written material produced by the students in the classroom, either on their own initiative or as a response to a given indication.

This work is part of the results of a doctoral thesis that collected and analyzed 100 writings in a school cycle, which comprises two semesters of the language subject. 20 first-year students participated from a high school incorporated to the Benemérita Universidad Autónoma de Puebla (BUAP). Each of them produced five papers, which were part of their portfolio of evidence. Because of COVID-19, they finished their course online. As a result, students photographed their evidence portfolios and uploaded them to the *Moodle* platform. The quality of their cameras affected the clarity of the images, which explains the poor visibility in some texts.

The analysis was carried out with the software ATLAS.ti version 9.0.7. tool that allowed to carry out the management of the information. The various functions of the software were adapted to the content analysis method, which facilitated the encoding of the images. For this work, three examples of the texts analyzed are presented.

3. Analysis of data and results

The analysis of texts was based on Foucault theoretical proposal (2017) who defines the text as a discourse, a way of thinking, and this discourse reflects the linguistic skills. In addition, it involves social practices such as the relationship between the individual and institutions such as the family, school and society, as well as power relations that are established in the construction of the subjective perspective. Subjectivity involves the unconscious and conscious dimension of a person's emotional life. From this conceptual reference, the text of a student is defined as a discourse imbued with ideas that underlie linguistic skills, emotions, power relations and social practices, which result from the context in which the student develops and that affect his/her communication skills.

The text is the semantic unit. It has a generic structure, internal cohesion and results from the environment; therefore, it is a complex semiotic instrument. For Halliday (2017), it is a process in continuous movement that expresses the signs and meanings through which culture, language and the way of life are communicated. This leads to the analysis focused on discursive training to answer two questions: What are the main difficulties students face in relation to reading and writing codes? And how does the context influence their writings?

Discursive formation refers to the number of scattered statements in the text, vocabulary, thematic choices, order, correlations, syntactic and semantic function that are used in the text. The discursive formulation allows analyzing the statements and their dispersion in the text, in addition to identifying ideological elements, the dominance of a topic, objectivity and subjectivity that influence the student.

For Foucault (2017), the written discourse identifies a differentiation system and the relationships that people establish with each other, with the distribution of roles, subordination, hierarchy, claims, suggestions, and the transmission and exchange of information with other individuals. Although this author focuses mainly on the discourse of physicians, his proposal can be applied in other studies, as is the case of high school students. Through the review and analysis of their texts, categories of analysis are identified on the content and contexts of their writings, their behavior, their relationship with academic, religious, and family insti-

tutions. Therefore, it is important to know the main difficulties that students face in their writing, as well as the production context of the writings.

3.1 Student writing product analysis

The student writing product refers to text presentation (Cassany, 1999). It consists of planning, writing, reviewing, using rewriting, and is considered the reflection of a style. For this purpose, the definition of Halliday (2017) is used. He argues that the text is the semantic unit that is written in sentences and is characterized by lexicogrammatical features, has internal cohesion and functions as a whole. Based on the above, elements such as cohesion and coherence were analyzed in the texts of student production.

Cohesion constitutes the essence of the text; it is the way in which the subject is treated, i.e., how students develop and relate their ideas. In turn, it is related to pragmatics and semantics. Therefore, a text has a generic structure, has internal cohesion; it is the relevant environment in the textual systems of grammar. On the other hand, it allows to identify meanings at ideational and interpersonal level. A text is a product of its environment and works in that environment (Halliday, 2017).

Consistency refers to join one idea with another. It constitutes the structure and unity of the text, and it is observed in the text at the syntactic and morphological level to give order to the discourse (Chomsky, 1980). These elements are reflected in the texts of student production through the orthography, vocabulary and the ability to reflect that they have to transform formal to informal contexts and vice versa. The following example derives from a travel experience.

According to Aparicio *et al.* (2017), travelogue relate real events, describe landscapes and observed events, narrate experiences that can be accompanied by graphic resources. It is a text that mixes the objectivity and subjectivity of lived feelings, prevailing the first. They are cataloged as historical texts by the visual resources that are collected during the trip and support the truth of what is told. In this research, the approach, objectivity and intention of the paper are taken into account with the notebook. As a customizable document, it allowed to observe the use of different verbal records, the retrieval of data, impressions, ideas and reflections on the concrete personal experience.

Figure 1. *The star of Puebla*

Note. Recovered from travelogue activity.

In the texts analyzed, it was observed that they lack graphic resources, expression of ideas and coherent and creative compositions. There is no adequate use of punctuation marks. There is an excessive use of extensive affirmative statements, paused only by commas and inadequate semantic choice, as seen in the previous example "to what", "a type of fountain".

Following this example, social and personal practices were analyzed considering the conscious and unconscious dimensions proposed by Foucault (2017). The conscious dimension arises from social practices, while the unconscious dimension focuses on individual aspects. These dimensions define the characteristics that students acquire to build their identity, which are reflected in their writings by their discursive practice. Table 1 shows the analysis based on the two dimensions, considering the grammar, as well as the aspects established in the curriculum, defined for disciplinary competence number 5.

Table 1. *Dimensions of discursive practice*

Discursive practice	Travelogue Interaction		
Interaction mode	Informal		
Conscious dimension	Social practice Communicative schemes	Scope of action, expression	Family and leisure, refreshing, disgust, annoyance
Unconscious dimension	Relevant actions	Demonstration	drama, tragedy, hell Spelling and writing

Discursive practice	Travelogue Interaction
Interaction mode	Informal
hell Spelling and writing	no grammar rules
Disciplinary competence 5 communication to develop	Not a coherent composition, no introduction, development and clear conclusions

The conscious dimension related to the social practice highlighted in blue involves the scope in which the narrated action occurs, i.e., family coexistence and recreation. The next action that is inserted in this dimension is the communicative scheme that expresses feelings of annoyance and physical sensations. As for the unconscious dimension, highlighted in light blue, it includes relevant actions such as the narration of a scene that goes through the physical and temporal location; the presentation of characters to figure segments of drama and tragedy, which culminates in a heroic and almost unhappy ending "when climbing the wheel, the floor of the cube felt very ugly, it trembled and shook so much I thought I was that it was going to fall".

In the travelogue as a discursive practice, the communicative scheme is observed with elements of context that reflect disgust and annoyance; the action of refreshing oneself and the "nightmare" lived is a form of informal interaction. The inadequate use of the spelling and punctuation "so", "felt", "fall" are observed. However, other resources are identified; at the beginning of the narration, it is observed that the student places the reader in a frame and in a scene "When the Puebla Star is inaugurated". It involves anonymous characters "we heard opinions from people who had already gone." On the other hand, he tries to convey his feelings and emotions related to the bad experience lived when attending a free event. It expresses context and relations with the use of metaphor, representing a hot day with "hell" to express an unpleasant situation.

Another literary figure is the comparison when establishing the relationship between hell and water, which counteracts the suffering when saying "the good thing at that time was that, in the middle of the area there was a water fountain", establishing a relationship of contrast between a real element and an imaginary one. It represents a dramatic and unpleasant tone in its narration. The student uses casual language with a colloquial style. He narrates his trip without considering that the recipients will be academics who will evaluate his activity. The student highlights the tragic influence that relates to the intimacy of the family context and not to the grammatical rules.

The analysis shows that students do not focus on the content of what they communicate, but they are only interested in transmitting their feelings and emotions, regardless of who the reader is. Thus, students construct their texts from everyday life. They use descriptive, emotional, and extensive discursive formations. In this sense, the epistemic conception of writing mentioned by Villalón and Mateos (2009) is applied, because writing becomes a useful learning instrument, so it is the students who decide to transmit their feelings or emotions. During the writing process the students attend to both conceptual and formal aspects in order to adjust them to their communicative purposes. Likewise, the students describe their environment: places, things, objects, actions, qualities or moods, relating them to their own consciousness, which is necessary for the students to express and identify. In the analysis of travel notebooks, the description of facts prevails, using linguistic resources derived from the emotional function of language (Jakobson, 1983). Despite not following a writing process and the grammatical difficulties, the students do not limit themselves in the extension of the writings when it comes to emotional facts. Therefore, emotion prevails rather than the proper use of grammatical rules, as observed in the essays.

The essay is another of the analyzed texts, it is an expository and persuasive text that according to Padilla *et al.* (2022) has a sociolectal invariance, which implies the determined use of a vocabulary and its relationship with a specific area of knowledge. Therefore, when writing this type of writings, students require not only subject mastery and vocabulary but also the ability to research, develop their ideas and sustain information as required in high school.

Therefore, the student defends a position on the subject addressed in his writing. One of the aspects to evaluate is the use of textual quotations to

raise the student's awareness of academic honesty. In addition, the structure of this type of text is evaluated: introduction, development, and conclusion. Due to its complexity, this paper is evaluated at the end of the school cycle, so the student applies the communicative skills learned during the course.

When analyzing the essays, it was observed that there is no argumentation and position on the part of the students, there is no connection or association between their reality or context and the subject. However, there is coherence in the writings by the use of discursive links. On the other hand, paragraphs were copied in their entirety from other authors and were plagiarized. It was observed that they do not construct original argumentative texts in comparison with travel notebooks, in which, despite the lack of coherence and consistency, they are extensive and original because students try to generate a narrative. This situation leads to reflect on what Hernández (2016) calls "the annulment of the *self* in writing", i.e., their disqualification as authors of their ideas, or the prohibition of expressing themselves in their own voice, and this has been reflected mainly in the essays.

The text is the primary transmission source of culture, so the linguistic system evolves in social contexts. This is one of the reasons why it is established that the student makes speeches thinking on grammatical rules, because they describe their experiences without the spelling, syntactic or semantic check, giving priority to emotion. Consequently, the difference between the essay writing and the travel notebook is due to the relational exchange that occurs in the social contexts where the student lives, and this allows the development of the argumentation and structuring of his writings. When it comes to argumentative and reflective texts such as the essay, the student is completely annulled as an author, unlike when he narrates his stories or anecdotes.

3.2 Discursive practice of student texts

Discursive practice is defined as the way of thinking, saying, and doing of the student from his writings. The aspects that constitute the *ethos* are considered, a concept that starts from the classification of three elements that converge for creating an ethical communication: values (*ethos*), arguments (*logos*) and feelings (*pathos*) and that work simulta-

neously. The *ethos* means custom and is based on the qualities a speaker has to build confidence in what he says (Rodríguez, 2005). It is the way of being and doing of the student in relation to the social, cultural and family elements described in his writings.

In discursive practice the student has no limits to tell his experiences, since the emotional function focuses on the speaker and his emotions. The purely emotional content in the writing is represented by the interjections "Hello", "greetings", "goodbye", leaving aside the syntactic and highlighting sentences that are of interest to him. Consequently, the student does not fulfill the basic communication skills.

This led to a greater focus on discursive practice during the analysis. According to Foucault (2017), in addition to the coherence and consistency of the texts, it is necessary to consider the architecture of the concepts, their general and abstract characteristics. When the student articulates his writings, he links ideas in the text, reflects his thought and way of life. Therefore, the dispersion of statements, linguistic formation and the representation conditions of writings are analyzed, with the purpose of signifying the text in its entirety and deducing its form of written expression with the appearance and dispersion of statements.

Foucault (2019) suggests that in discursive practices, the scenarios that constitute the subject from the social point of view are glimpsed, and the way they shape the subjectivities. The different groups of texts analyzed were transformed into discursive resources that reflected the structuring of the power relations that of the students in different scenarios. These resources are formed in relation to the absence or presence of discursive practices; therefore, they have the power to transport the knowledge of the students. For this reason, the analysis of the construction of the *ethos*, i.e., the way of being and the identity expressed in the practices while excluding the linguistic norms arises.

The following example derives from a group of autobiographical texts. The autobiography is cataloged as a historical text because it narrates a real and verifiable event. It intends to inquire into the author's history to understand the foundations of his identity. It considers the retrospective look of the student, who writes about the most significant aspects of his life.

Figure 2. *Autobiography*

Note: Fragment retrieved from evidence portfolio. A common problem that arose in the collection of portfolios was that some works were not focused correctly, however, they could be rescued.

It is observed that in the story the student refers to the birth, "everything begins on March 25", part of the existence and domination of generalities growing from the birth. These are short paragraphs that show a narrative sequence. The paragraph length reflects descriptions and arguments, using discursive markers: "so", "but", with the intention of generating extensive statements. There is a formal linguistic register without graphic resources, and the student refers to dates and places to give veracity to the stories, "Puebla", "UPAEP", "León". In this case, the poetic function of the language "I belong to the spring season" is employed. On the other hand, Figure 3 explains the scenarios that, according to Foucault (2019), constitutes the subject and expresses the subjectivities that configure his self.

The figure represents the discursive practice and its different elements. The interaction modality of the text, highlighted in green, which can be formal or informal, depends on the communication process used by the students. The scenarios that constitute the subject are highlighted in blue and can be from a social or individual practice. The individual practice includes the expressions that reflect how the student is assumed as a subject.

The yellow section corresponds to the formation of subjectivity, and it highlights the relevant actions that express the subjectivities that configure the identity of the student: "I was born", "I lived", "my name", "I studied". Subsequently, there are the discursive objects, highlighted in gray, that involve the social and individual part. These discursive objects are identified by institutions such as the family and the school, influencing the formation of the social subjectivity of the student and conditioning it to function as a child or as a student. Consequently, these factors influence the identity formation. Therefore, autobiography, as a discursive practice, allows to identify the family relationships and life forms that constitute the social practices of the student. Through a formal and autobiographical language and from their individual practice, they reflect expressions that constitute them as subjects, manifesting the personality that they describe by

their social experiences, "according to family members that's why I'm cheerful and smile a lot, I don't think it's like that." Finally, the orthography and wording highlighted in orange, which is present throughout the writing and allows identifying how they present their discursive practice.

Figure 3. *Scenarios that constitute the subject*
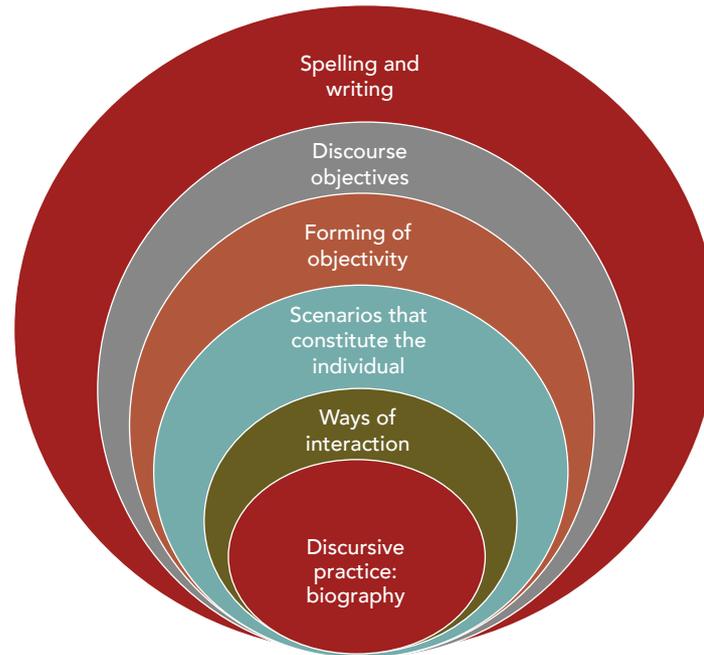
Referring to Figure 2, it was observed that the student articulates the text through its existence "everything begins on March 25". This makes it easy to generate short paragraphs with a narrative sequence, involving different participants that have influenced his formation: "grandmother", "aunt", "a friend", "best friend" and "cousin". The student develops some communicative competencies when using linguistic resources, such as the poetic function of language. He focuses on the form of the message and uses literary resources to give greater emphasis to the information that is transmitted.

The emotional tone of sadness and disenchantment prevails: "happiness ends", "I cried a lot because I separated from my best friend and cousin", "they gave me my first cell phone and I lost it". While using comparison as a literary figure, he manages to narrate his life story as if it were a narrative story. Finally, from the discursive formation, the student includes the family environment and reflects on the school context, showing the domain of linguistic registration. Consequently, the first articulation of the language proposed by Foucault (2019) is identified, which goes from the specific to the general

when he mentions "everything begins on", at the same time he goes from the substantial to the quality. Thus, there is an unfolding of the language, what is expressed with words and what is beyond their descriptions.

On the other hand, considering the scenarios that constitute the subject and the formation of subjectivity through the autobiographical discursive practice, the individual practice uses the expressions that reflect how the student sees himself as an individual when saying "my mom says I was very small", "my mom says that I was very restless". These phrases reflect the scenarios that are shaping the subjectivity of the student and the power relations that he experiences "the hospital almost sues my parents", "I had to change schools because my parents separated". Therefore, scenarios such as school, home and hospital refer to the context in which the student develops. In this way, the power of institutions such as the family and the school is represented, influencing the formation of a subjectivity.

Autobiography as a discursive practice shows the existence of an articulation in the discourse, so that the receiver can easily identify the narrative.

Articulation and drafting problems are not an obstacle to translating ideas, because they only want to express emotions, so spelling rules are not taken into account. Consequently, an incoherent and informal discourse is presented. Thus, the linguistic competence to identify the different types of records, and to know when they should be used, is nonexistent. However, there is a narrative that reflects the articulation of language with generalities and the use of nouns, verbs, adjectives and connectors.

On the other hand, the words used have a level of clarity that reflect location, identity and connection that give meaning to the writing. The formulation of statements, in terms of their linguistic and logical structures, as well as the splitting of meanings cannot only be considered as the cumulative result of several statements barely articulated without coherence or cohesion as observed, but it reflects elements of context and identity "a lot changed since that point it became very difficult to make friends", "I lived a new virus known as COVID-19".

There are hidden elements that work according to the enunciative modality, i.e., the unsaid or the repressed. It is not the same either in its structure or in its effect, when it comes to a mathematical statement, an autobiography or the story of a dream (Foucault, 2017) "my story translated in words", "the days went by and I got friends". These unspoken elements are observed in certain phrases and words in which they also reflect a way of life and linguistic records "thank God that", "indeed the day that".

4. Discussion and conclusions

The results show that students have not properly assimilated reading and writing skills, in addition to identifying the social, cultural or economic elements that influence their learning. However, the size of the sample analyzed is moderate, so it is considered risky to generalize that all high school students have the same limitations in their writings. However, it is considered that this research provides a different perspective to approach reading and writing issues in high school students. The point is not to focus on the deficiencies of the writings, but to expand the look towards the subject of the writing, since it allows to reflect on questioning the place of the writing, and the role of this instrument in the subjectivity of students and the different forces that prevent them

from being significant. Therefore, it is proposed to broaden the look to see writings not only as a product, but also to see the human being behind it, the subjectivity that is seeking to appropriate this semiotic instrument and consider the context in which these writings take place.

The aim of this study was to identify the main difficulties faced by students in relation to reading and writing codes in high school, as well as the context of writing production. It is concluded that the main difficulties faced by students in relation to reading and writing codes are related to grammar. Spelling and writing are one of the main shortcomings of students. These elements are reflected in the texts through spelling, vocabulary and the ability to reflect. It was noted that they lack graphic resources, expression of ideas and coherent compositions. There is no adequate use of punctuation marks.

On the other hand, the context of writing production is the element that encourages writing to flow or be limited in the student. On the one hand, the emotional part given in pleasant spaces and experiences stimulates the creativity of the students, and on the other, the grammatical part, given in the classroom space limits the writing. On the emotional aspect, they also highlight the unpleasant experiences they write, the result of hostile environments, leading to the writing and presentation of brief and unstructured writings. As for grammatical structures and spelling, they limit their communicative skills by not using them correctly. Therefore, it is proposed to promote the learning and development of reading and writing skills considering the social and cultural context of the students. Experiences and beliefs, as well as conditions of time and space, in the texts produced are factors that limit or facilitate writing.

The content analysis showed the production conditions that constitute the determination of the texts, i.e., the psychological, sociological and cultural conditions of the individual. It was observed that students do not focus on the content of what they communicate, but on their status as writers. The main intention is to transmit their feelings and emotions, regardless of who the reader is. Therefore, the importance of the subject of writing is highlighted.

Finally, it is necessary to make visible the challenges presented by the student with the analysis and reflection of the writings. The idea was to highlight and preserve the richness of the human in a

paper, beyond a mechanistic reduction of complying with a rubric of evaluation. The aim is to change the subordination positioning that has been given to the student, and instead of pointing out the errors by adopting the mechanistic pedagogy of spelling and writing, it is necessary to analyze what is beyond student writings, i.e., not remain in the product, but in the subject of writing, since this subject of writing has feelings, a life story, a family and a location.

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Problems-based learning for teaching forensic anthropology in High School

Aprendizaje basado en problemas para enseñar antropología forense en educación secundaria

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Abstract

Growing interest in Criminology degrees over the past few years is mainly due to various television series on forensic matters. These programs have created a distorted image of forensic anthropology which has led not only to an increase in the number of degree applicants but also, in many cases, disappointment among students regarding the course contents. Consequently, knowledge of forensic anthropology in pre-university environments involves designing educational innovation projects with active methodologies that manage to train students in the essential areas of this discipline and in the tasks performed by forensic anthropologists. This work presents the results of an educational innovation proposal, based on Problems Based Learning (PBL), implemented among students to assess the effectiveness of PBL in the learning of forensic anthropology. In a workshop, students work as anthropologists for a day, applying forensic methods and techniques to identify several individuals by determining their stature, gender and age. The results show that PBL encouraged a motivating environment and significant and collaborative learning to determine the identity of the individuals, and more advantageous acceptance is perceived of the method and workshop techniques both by the participants and by teachers in the school.

Keywords: physical anthropology, criminology, teaching methods, activity learning, educational innovations, secondary education.

Resumen

El creciente interés por el Grado en Criminología en los últimos años se ha debido principalmente a la emisión de series con temas forenses. Estas han generado una imagen distorsionada de la antropología forense que se ha traducido principalmente en un aumento del número de discentes en el grado y, en numerosos casos, en una decepción por los contenidos del itinerario formativo. Por ello, el conocimiento de la antropología forense en la etapa preuniversitaria requiere diseñar proyectos de innovación educativa con metodologías activas que logren formar al alumnado en las áreas esenciales de esta disciplina. Este trabajo presenta los resultados de una propuesta de innovación, basada en el Aprendizaje Basado en Problemas (ABP), implementada en los cursos de tercero y cuarto de educación secundaria con el objetivo de evaluar la eficacia del ABP en el aprendizaje de la antropología forense. El alumnado se convierte en antropólogos por un día aplicando métodos y técnicas forenses para identificar varios individuos a través de la experimentación y determinación de la estatura, el sexo y la edad. Los resultados del estudio muestran que el ABP fomentó en el aula un ambiente motivador, colaborativo y un aprendizaje significativo para establecer la identidad de los individuos; así como se percibió una aceptación muy favorable del método y las técnicas del taller por parte de los participantes y el profesorado.

Palabras clave: antropología física, criminología, método de enseñanza, aprendizaje activo, innovación educacional, enseñanza secundaria.

1. Introduction

Forensic anthropology is defined by the American Board of Forensic Anthropology (2018) as "the science application of physical or biological anthropology in the legal process." This science tries to identify skeleton or semi-skeleton human skeletal remains in order to clarify the causes of death through methods and techniques of archeology and biological anthropology (Turner and Selva, 2020). This is carried out in relation to the investigation of judicial cases associated with crime, causes and circumstances of death such as pathologies, injuries, etc., trying to determine age, height, body proportions, sex, human traits and racial affiliation (Anadón and Robledo, 2010). The forensic anthropologist tries to reconstruct the entire process *antemorten*, *perimorten* and *postmorten* with the help of other scientific disciplines, since it is a multidisciplinary science that combines different disciplines such as biological anthropology, criminology, anthropology, and archeology in order to exhume and identify human skeletal remains.

Since the end of the 20th century, forensic anthropology has received greater attention from public agencies for its important contribution in the exhumation and identification of disappeared people (Rodríguez, 1994). The popular interest in this science, however, is more recent and has been mainly due to the broadcasting of series on television and on the platforms or *streaming* with forensic themes (McManus, 2010). The success of these programs seems to be a consequence of the complex cases they investigate and the ability of their protagonists to solve virtually any question. This has generated a distorted image of forensic anthropology (Sosa, 2017) and a growing interest in the Degree in Criminology that, in recent years, has increased the number of students (López, 2018).

The knowledge of forensic anthropology and the role of forensic anthropologist in the pre-university environment requires designing and implementing educational innovation strategies that allow students to learn the areas of knowledge that are essential in this science, and provide sufficient criteria for the distinction between reality and fiction of the work of forensic anthropologists and the own limitations of anthropological science.

The active methodologies for teaching forensic anthropology and criminology in high school students have yielded very positive results in relation to evidence collection, experimentation and collaborative work (Vallejo *et al.,* 2005, 2007), gamification (Carrillo *et al.,* 2018), role-playing (Sebastiany *et al.,* 2013), case methods (Núñez, 2015, 2016; Núñez and Rodríguez 2020) and Problem Based Learning (PBL) (Kousen and Vargas, 2021), among others, as an alternative to traditional methods.

The PBL is a constructivist methodology that promotes reflective, critical, and open learning based on the complexity of knowledge, making teachers in the classroom cooperate in different tasks, through reflection and negotiation with the aim of obtaining a final product that provides a solution to a problem or challenge (Schwartz, 2013).

The use of the PBL allows students to acquire knowledge to solve a real or fictitious problem. It is an active methodology in which students collaborate to build their own knowledge through real-life problems (Moust *et al.,* 2021).

Studies based on the PBL confirm that students using this method show an improvement in learning compared to traditional teaching or master class (Aidoo *et al.,* 2016). The PBL promotes a comprehensive education, which favors the development of positive values such as affectivity, facilitates student participation, generates an environment of trust and mutual respect and enhances the ability to analyze contexts and realities contributing to the acquisition of critical thinking and the integral formation of citizens (Basilotta and García-Valcárcel, 2019). It is therefore a methodology in which students must solve the problem posed by teachers through research and reflection.

Therefore, the PBL is conceived as the most favorable active methodology for teaching and learning forensic anthropology. Choosing a learning strategy and designing a project based on real cases can allow positioning students in situations that allow them to understand the importance of the research work, either individual or collective, of forensic anthropologists. The project contemplates activities that stimulate different attitudes in the student: from observation to the manipulation of bone elements, from curiosity to interrogation and inquiry, from reasoning to experimentation and trial and error (Sebastiany *et al.,* 2013). The combination

of these attitudes encourages students to develop skills related to analysis, understanding, communication and creativity and contributing to the acquisition of skills and abilities to achieve a comprehensive education in the individual according to the 21st century (Pérez and Beltrán, 2014).

This paper presents the results of an educational innovation proposal based on the PBL, implemented in students of third and fourth Compulsory Secondary Education (ESO) in a high school in the Community of Madrid, as a didactic strategy for teaching and learning basic knowledge of forensic anthropology and the work performed by forensic anthropologists. Therefore, the main objective of this research is to evaluate the effectiveness of the PBL methodology in the teaching of forensic anthropology. The achievement of this main objective additionally enables the following specific objectives:

- Introduce the students to the knowledge of forensic anthropology.
- Teach students to identify the main bones of the human skeleton and to recognize and learn their most basic functions.

- Learn the information provided by the main bones of the human skeleton for recognizing and identifying people.

2. Methodology

This educational innovation proposal has been designed to be implemented in the subject of biology, part 4, people and health, with the students of third grade of the ESO (Royal Decree 1105/2014, of December 26); although this can be implemented in other educational levels as fourth of the ESO or first of Baccalaureate (Fernández-Laso *et al.*, 2022).

The proposal is to teach forensic anthropology in a criminal investigation. In other words, it seeks to promote the analysis and evaluation skills in the different expert actions in human identification in a criminal investigation. To do this, the design of the proposal has been based on the biological tetrahedron (age, sex, height and ancestry) and antemorten information described by Núñez and Rodríguez (2020) (table 1).

Table 1. *Bioanthropological tetrahedron for postmortem identification of individuals in forensic anthropology*

Concept	Method	Techniques
Age	Thorough visual inspection of tooth development, emergence, and replacement	Observation of morphological changes or degeneration of bones in the joint
Gender	Analysis of the morphological characteristics of the skull and pelvis. The most robust and largest segments are male, while the most graceful and smallest segments are female.	Size and robustness using formulas to identify sexual dimorphism and corpulence indexes
Ancestry	Craniofacial variations (nostril and orbits), and tooth patterns and postcranial skeletal morphology	It is classified into leukoderms, xanthoderms, and melanoderms
Height	Total length of long bones	Broca´s Osteometric table according to ancestral pattern and sex.

Note. Own elaboration from Núñez and Rodríguez (2020).

The educational innovation project has been conceived from a qualitative and quantitative approach to design a proposal based on empirical research that analyzes, through PBL, a fictitious or real case with information that can be analyzed qualitatively and quantitatively in relation to the findings of some bone remains (Fernández-Laso *et al.*, 2022). This type of methodology and its resolution degree depends on the role of the teacher, who goes from transmitter to enhance a participative attitude of the student and his reflective capacity on the achieved learning. To do this, it is necessary to design a proper pedagogical project that connects the problem with a real context that arouses the interest of the students and leads them to make justified decisions (Poot-Delgado, 2013).

2.1 Sample

The present proposal was carried out at the Francisco de Goya High School (IES) in Madrid, with a sample consisting of 11 third (six students and five students) and 10 fourth (seven students and three students) of the ESO. The students were selected by the school's management based on criteria based on final grades and in accordance with the Covid-19 prevention measures established by the Community of Madrid for the 2020-2021 academic year. In addition, the workshop was evaluated by three teachers from the center present during its development and who teach subjects related to the specialty of Biology and History (one and two teachers, respectively).

2.2 Procedure

The workshop was held on June 16, 2021 in the Natural Sciences and Biology Laboratory of the IES.

The center provided all the necessary resources for its conduction: fact sheet with the news, knowledge sheets, police, anthropological and expert (figure 1), replicas of bone remains, osteometric table to measure long bones and the rubrics of self-assessment of teachers and evaluation for teachers (tables 2 and 3).

The workshop was conducted first with third and then with fourth grade students, lasting approximately two hours. The workshop began with a PowerPoint presentation that explained basic ideas on forensic anthropology; the workshop was subsequently conducted in different phases.

2.3 Problem Presentation

Students were presented with a recent news story in Cerdido (A Coruña, Spain) and published by Europa Press:

- Bone remains of a human body were found late Wednesday afternoon, August 26, in A Casanova, belonging to the parish of A Barqueira, in the municipality of Cerdido (A Coruña).
- During the morning of this Thursday, it is expected that agents of the Scientific Police and

Judicial Police of the Civil Guard in addition to forensics will travel to the place, which is sealed, to proceed with the removal of the remains and try to determine their identity.
- After the discovery, speculation about the body's identity began in the area. Some sources consulted shuffle that it may be Yago de la Puente, the young man from A Coruña whose track was lost on July 14, 2019 when he returned from the International Celtic World Festival of Ortigueira.
- He was last seen at Piggy Station. After his disappearance, several search forces were deployed on several occasions, involving the Civil Guard and Civil Protection, as well as family and friends, although they were unable to find his whereabouts. It is less than two kilometers away from the train station of Cerdido to the place where the skeletal remains have appeared. (27 August 2020)

And they were asked to collaborate as forensic anthropologists so that they could recognize the identity of the skeletal remains.

2.4 Phase 2: gathering background knowledge

At this stage, each student was provided with an anonymous "knowledge sheet" intended to determine the degree of knowledge they had about bones and their usefulness in the identification process. This file consists of six images accompanied by two questions each. The 12 questions are multiple choice. The first six items per image provided information on the identification of skeletal remains represented in each of the images and the remaining six items collected information on the potential information that each of the skeletal elements can provide in the personal identification process. In these images, the student should circle the name of the bone he considers shaded and the anthropological usefulness. For evatuating pre-workshop knowledge, the answers to the items mentioned above were re-coded in a dichotomous way (correct/incorrect answer).

Figure 1. *Tabs provided to students for conducting the workshop*
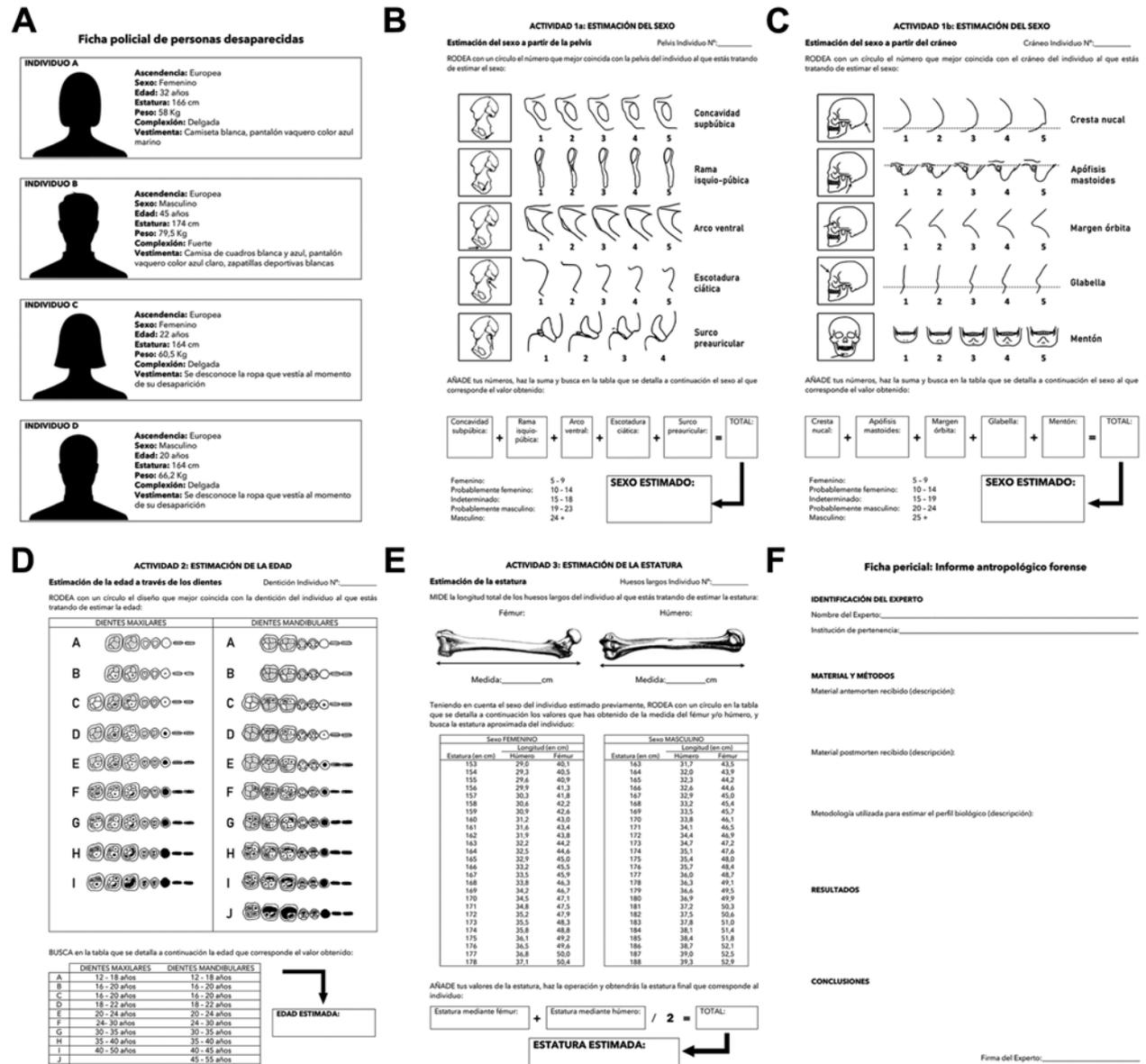
Note: A: Police record; B and C: Sex estimation record; D: Age estimation record. E: Information sheet for estimating height; F: Information sheet. Elaboration from Fernández-Laso et al. (2022).

2.5 Phase 3: Construction of the "Anthropological Puzzle"

In phase 3, students were randomly divided into four working groups of two or three people, and the different bones were explained to know their value at the anthropological level. To do this, each group was given a bone sample belonging to the same person; this consists of a skeleton cranial (a skull and a jaw) and postcranial (a humerus, an ulna and a radius, a pelvis, a femur and a tibia). If the center of the bone elements is not available, they can be replaced by images.

In addition, each group received a "police record" with the physical characteristics of the 4 missing people (figure 1A); an "anthropological record" with the main differences and tables used in forensic anthropology to identify a person (figure 1B-E); and a

final "expert record" to make an expert report determining the anthropological identification of the bones they had (figure 1F). Thus, each group had to identify to which individual in the "police record" the assigned skeletal remains belonged. At this stage the teacher should act as a guide.

2.6 Phase 4: Solving the "anthropological puzzle"

In phase 4, the different groups explained in an argumentative way, to which individual they believed the bone remains analyzed belonged. In the case of coincidences in the same identification between two or more groups, a debate should be initiated between the different coincident groups and the teacher should help them to verify the anthropological characteristics of each bone through questions that guide the students to clarify the bone identifications. Finally, the identification of all individuals was completed, the news was resumed, and a scientific debate

was held in the assembly as "anthropologists" on the relevance of the work of forensic anthropologists.

2.7 Phase 5: Post-workshop data collection

In phase 5, each student re-filled the "knowledge sheet" to obtain the assessment and reflection of the students on the workshop held. The post-workshop evaluation was re-coded in a dichotomous way (correct/incorrect).

2.8 Phase 6: Students' perception of the workshop

In phase 6, participants completed a self-assessment rubric designed to encourage reflection on their own learning (table 2) so that they could assess their knowledge of the subject matter and, consequently, explore the possibilities of improving the workshop (Reddy and Andrade, 2010).

Table 2. *Self-assessment heading*

Evaluation criteria	1 Bad	2 Average	3 Good	4 Very good
I know the roles of a forensic anthropologist.				
I recognize the main bones of the human skeleton.				
I am able to use every bone to determine every single anthropological parameter.				
The tables provided can be used correctly.				
I am able to think and argue coherently.				
I recognize the importance of positive identification.				
I can identify the actual cases in which the forensic anthropologist's action is necessary.				

Note. Fernández-Laso et al. (2022).

2.9 Phase 7: Teachers' perception of the workshop

Finally, an assessment rubric was given to the teachers attending the workshop (Table 3).

The purpose of the rubrics in these last two phases was to: 1) facilitate the definition of the main aspects to evaluate and the relevance given to each of them; 2) allow students to reflect on what they have

learned. For this purpose, it is essential to identify the objectives of the activity and establish evaluation criteria; explain to the student what objectives are pursued in the workshop, how it will be carried out and what criteria will be evaluated; and finally, analyze with the student the qualification obtained by these students and the one given by the teacher (Fraile *et al.*, 2017).

Table 3. *Heading of teacher evaluation*

Evaluation criteria	1 Average	2 Good	3 Very good	4 Excellent
The activity improves the contents explained in class.				
The activity is related to real cases.				
The activity is dynamic and novel.				
The duration of the activity is adequate.				
The materials provided are suitable for the activity.				

Note. Fernández-Laso et al. (2022).

2.10 Statistical Analysis

Descriptive analysis techniques and nonparametric statistical techniques were used in the statistical analysis of the data obtained. Descriptive analysis was performed to determine the characteristics of the study sample (mean, standard deviation and percentage). The comparison of students' knowledge between pre and post-workshop was performed using the McNemar test (also known as paired chi-square or paired data).

The McNemar test is applied to 2×2 contingency tables with dichotomous traits, with paired pairs of data, to determine whether the marginal row and column frequencies are equal, i.e., whether there is "marginal homogeneity". Note that McNemar test calculations focus on discordant pairs and ignore concordant pairs. More specifically, the test is a relationship between the squared difference in discordant frequencies relative to total discordant frequencies. In this case, the test has been used to verify the existence of differences in dichotomous data (correct/incorrect answer) before and after the participation of the students in the learning workshop, i.e., to evaluate the effectiveness of the developed workshop.

To assess students' perception of competency-based learning, the *U*-Mann-Whitney analysis was performed for ordinal qualitative variables. This test allowed us to assess whether there are differences in the proportions of each category observed in two different groups.

All statistical analyzes were performed using IBM SPSS Statistics (version 25.0 for Windows), using a significance level of $p < 0.05$.

3. Results

The results are presented according to the learning of the teachers, the perception of the students and the evaluation of the teachers.

3.1 Effects of the workshop on students

The results of the pre- and post-workshop knowledge tests revealed increased competence of secondary school students after completing the learning workshop (Table 4). In third grade students, significant differences were obtained in the tasks related to the information that could provide the teeth, ribs, and skull in the personal identification processes ($p < 0.05$), while in fourth grade students this difference was limited only to the information that could provide the skull ($p < 0.05$).

In general, the students had good knowledge of human anatomy and did not find excessive difficulty to correctly identify and name the different skeletal elements (teeth, pelvis, ribs, femur, humerus, skull) ($p > 0.05$); however, although they understood the usefulness of some of the skeletal elements for the process of personal identification (pelvis for the estimation of sex, femur and humerus for the estimation of height) ($p > 0.05$), the participants acquired greater knowledge after the development of the workshop and improved their skills to understand the usefulness of the other skeletal elements during the forensic identification process workshop (teeth and ribs for age estimation, skull for sex estimation) ($p < 0.05$).

Table 4. *Statistical analysis of pre- and post-activity students' knowledge about the nomenclature of the different skeletal elements and its usefulness in providing information in the process of personal identification*

Group	n/N (%)											
	Task 1		Task 2		Task 3		Task 4		Task 5		Task 6	
	Name bone	Inf.	Name bone	Inf.	Name bone	Inf.	Name bone	Inf.	Name bone	Inf.	Name bone	Inf.
Group 1 (3RD ESO)												
Pre-activity	9/11 (81,8)	4/11 (36,4)	9/11 (81,8)	10/11 (90,9)	11/11 (100)	1/11 (9,1)	8/11 (72,7)	9/11 (81,8)	5/11 (45,5)	7/11 (63,6)	10/11 (90,9)	4/11 (36,4)
Post-activity	11/11 (100)	11/11 (100)	11/11 (100)	11/11 (100)	11/11 (100)	7/11 (63,6)	11/11 (100)	10/11 (90,9)	8/11 (72,7)	9/11 (81,8)	11/11 (100)	11/11 (100)
McNemar test	0,500	5,143	0,500	0,000	N/A	4,167	1,333	0,000	1,333	0,250	0,000	5,143
p-value	0,500	0,016*	0,500	1,000	N/A	0,031*	0,250	1,000	0,250	0,625	1,000	0,016*
Group 2 (4° ESO)												
Pre-activity	10/10 (100)	7/10 (70,0)	10/10 (100)	8/10 (80,0)	10/10 (100)	0/10 (0)	9/10 (90,0)	10/10 (100)	5/10 (50,0)	6/10 (60,0)	9/10 (90,0)	0/10 (0)
Post-activity	10/10 (100)	10/10 (100)	10/10 (100)	10/10 (100)	10/10 (100)	2/10 (20,0)	10/10 (100)	9/10 (90,0)	8/10 (80,0)	4/10 (40,0)	10/10 (100)	9/10 (90,0)
McNemar test	N/A	1,333	N/A	0,500	N/A	0,500	0,000	0,000	0,800	0,250	0,000	7,111
p-value	N/A	0,250	N/A	0,500	N/A	0,500	1,000	1,000	0,375	0,625	1,000	0,004*
Groups												
combined	19/21 (90,5)	11/21 (52,4)	19/21 (90,5)	18/21 (85,7)	21/21 (100)	1/21 (4,8)	17/21 (81,0)	19/21 (90,5)	10/21 (47,6)	13/21 (61,9)	19/21 (90,5)	4/21 (19,0)
Pre-activity	21/21 (100)	21/21 (100)	21/21 (100)	21/21 (100)	21/21 (100)	9/21 (42,9)	21/21 (100)	19/21 (90,5)	16/21 (76,2)	13/21 (61,9)	21/21 (100)	20/21 (95,2)
Post-activity	0,500	8,100	0,500	1,333	N/A	6,125	2,250	0,250	3,125	0,125	0,500	14,063
McNemar test	0,500	0,002*	0,500	0,250	N/A	0,008*	0,125	1,000	0,070	1,000	0,500	0,000*
p-value												

Note: Info, information; N, number of students participating; n, number of students correctly answering questions; %, percentage of students correctly answering questions; N/A, statistical test not applicable. *Significance level for p < 0.05.

4.2 Perception of students

The results revealed the high perception of third and fourth grade students on their learning (Table 5). Thus, while the third grade students showed a greater perception of learning in the competence related to the functions of the forensic anthropologist ($p < 0.05$), the fourth grade students showed a greater perception of learning in two competences: the one related to the importance of carrying out an identification process on skeletal remains and the one related to knowing how to identify the real cases in which the action of the forensic anthropologist is necessary ($p < 0.05$).

Table 5. *Perception of students' competency-based learning*

Groups	Competencies													
	C1		C2		C3		C4		C5		C6		C7	
Group	N	M	DE	M	DE	M	DE	M	DE	M	DE	M	DE	M	DE
Group 1 (3rd ESO)	11	2,45	0,522	2,82	0,405	1,82	0,751	3,00	0,632	3,09	0,944	3,73	0,467	2,18	0,603
Group 2 (4th ESO)	10	3,00	0,471	3,30	0,675	2,30	0,823	2,90	0,568	2,80	0,632	2,90	0,568	3,00	0,667
Groups combined	21	2,71	0,561	3,05	0,590	2,05	0,805	2,95	0,590	2,95	0,805	3,33	0,658	2,57	0,746
U Mann-Whitney test		28,00		32,50		38,00		50,50		44,50		17,50		22,00	
p-value		0,026*		0,057		0,191		0,704		0,432		0,003*		0,011*	

Note: N, number of students participating; M, mean; SD, standard deviation; Scale 1 (minimum), 4 (maximum); *Level of significance for $p < 0.05$; C1, I know the functions of the forensic anthropologist; C2, I identify the main bones of the human skeleton; C3, I know how to use each bone to determine each of the anthropological parameters; C4, I know how to use the tables correctly; C5: I know how to argue coherently; C6, I know the importance of making a positive identification; C7, I know how to identify the actual cases in which the forensic anthropologist is necessary.

4.3 Teacher evaluation of the workshop

The results revealed the good perception of the teachers about the learning of the students, scoring with the maximum value all the evaluated categories.

4. Discussion and conclusions

Active methodologies, such as the PBL, facilitate the learning and development of certain competencies through real or fictitious situations linked to the professional and social world, which allows preparing students for the current information society. The implementation of active methodologies requires the teacher to rethink, reorient and plan teaching, placing the student in the center as the protagonist of the construction of his own learning. This type of didactic strategies requires, at the same time, a correct choice of evaluation criteria (Medina-Díaz and Verdejo-Carrión, 2020).

The implementation of the workshop "Anthropological Puzzle: Who is Who?" has allowed us to observe that the PBL as a teaching strategy has had very positive effects on students for the learning of basic knowledge about forensic anthropology. During the workshop, the students perceived a positive attitude to all the activity. Indeed, the use of images and some bone elements in the resolution of the case allowed the students to immerse themselves in the knowledge of human anatomy used in anthropological surveys for determining sex, age and height. This type of active methodologies allows achieving an adequate and useful learning in criminology (Beltrán *et al.,* 2017; Núñez and Rodríguez, 2020).

The workshop allowed to detect that the students had good knowledge about human anatomy in general, showing less difficulties the fourth-grade students than the third-grade students when identifying bone elements and their usefulness in the forensic identification process. Probably, this is a consequence, in both courses, of the absence or scarce practical activities that teachers carry out due to the lack of time to address the curricular contents (Carrillo *et al.,* 2018). However, it can also be due to the stress involved in conducting these workshops with specialists outside the center. Therefore, when designing these didactic strategies, it is essential not to burden the student with excessive information but to try in an objective way to introduce the minimum theoretical and methodological contents necessary for an essential understanding in forensic anthropology (Fernández, 2015).

However, despite this, the results of the workshop show that its realization provided students with greater knowledge about human anatomy, both in the identification of anatomical elements and, more

specifically, in their usefulness during the forensic identification process. In both courses, the skills of analysis, identification, comprehension and usefulness of bones improved after the workshop. This may be related to the use of the PBL for teaching forensic anthropology (Sosa, 2017), since it favors that students have a positive willingness to learn significantly and even more so when the idea is to motivate students (Carranza and Caldera, 2018; Pérez and Beltrán, 2014) through the solution of a real and mysterious case.

Indeed, the implementation of a workshop related to a real problem, as well as the knowledge and application of current anthropological techniques contributes to develop two of the fundamental aspects to achieve meaningful learning, such as knowing the functionality of what is learned (Coll, 2014; Carranza, 2017) and getting students to participate in the activity (Carranza, 2017; Garcés *et al.,* 2016). In this way, it is possible to get these students involved in the learning process and achieve a meaningful learning.

The results show that this type of constructivist methodologies in which the student is placed in real situations of the forensic anthropologist or criminologist provides a greater knowledge and integration of forensic anthropology and reality (Carrillo *et al.,* 2018; Núñez and Rodríguez, 2020; Sebastiany *et al.,* 2013; Vallejo *et al.,* 2007). Likewise, this workshop based on PBL promotes the development of the capacities of observation, inquiry, representation and prediction, contributing to arouse interest, curiosity, creativity and the development of hypotheses and explanatory models (Carrillo *et al.,* 2018). In addition, the workshop promotes the development of critical thinking in students by generating a reflective process when looking for solutions to the case (Morales, 2018), favoring dialogue, debate and group discussion (Colorado and Gutiérrez, 2016); as well as promoting cooperation and teamwork and, therefore, interpersonal relationships (Vallejo *et al.,* 2007).

In relation to the perception of the students about the workshop, the results indicate that aspects related to functionality stand out in both courses, i.e., the ability to understand the importance of what they have learned and to know how they can use it. Therefore, one of the essential aspects referred to by Coll (2014) and Carranza (2017) to achieve meaningful learning is highlighted again. The student

is able to recognize the importance of the collective, individual and research problem, which leads him to get involved in the problems of scientific research (Sebastiany *et al.,* 2013) and, therefore, to recognize the limitations of science and, at the same time, appreciate the idealization of criminology in the series (López, 2018). It also allows the State to detect and accept the possible existence of group conflicts, in which situations lead it to recognize the point of view of others and to value the importance of negotiating through dialogue, reflection and debate. These active didactic strategies for teaching identification of individuals in forensic anthropology promote meaningful and collaborative learning (Núñez and Rodríguez, 2020); and allow students to recognize individual differences that have their origin in body characteristics (height, age and physical and psychic differences), motivating tolerance towards difference (Vallejo *et al.,* 2007) and ethnic and cultural diversity.

Regarding the participating teachers, these results, although not representative for the scarce sample, highlight the need for evaluating the own activities to be carried out by teachers who have a broad knowledge of their subjects and who are involved in the constant search for new active teaching and learning strategies (Marcelo *et al.,* 2016).

Finally, although the number of participants in the workshop was reduced due to Covid-19, the results are consistent with those obtained in similar works (Carrillo *et al.,* 2018; Núñez and Rodríguez, 2020; Vallejo *et al.,* 2007). Therefore, the development of the proposal is considered a success for teaching and learning forensic anthropology in the students of the ESO. However, it is expected to be implemented in high schools with a wider sample to verify the feasibility of the project.

In conclusion, the development of this activity demonstrates that: 1) the PBL is a very suitable active methodology for teaching basic knowledge of forensic anthropology in secondary school students; 2) this active methodology allows students to check how knowledge of human anatomy is key to identify the identity of individuals and solve different issues in criminology; 3) provides basic knowledge in forensic anthropology to know the reality from the fiction of the forensic anthropologist's work; 4) reinforces the knowledge of human anatomy learned in the classroom by arousing their interest in an acti-

vity that favors meaningful learning and the development of certain competencies; 5) the workshop is values positively, both by students and teachers, due to its similarity with the cases developed in television series and *streaming* platforms and the reality performed by forensic teams today. In short, it provides them with practical knowledge about forensic anthropology and allows them a better choice of degree in their future university studies.

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Use of mobile devices in the classroom to stimulate and encourage learning. Study case: undergraduate students

Uso de dispositivos móviles en el aula para dinamizar e incentivar el aprendizaje. Estudio de caso con alumnado de pregrado

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Abstract

This text is developed because it looks to understand how new pedagogies based on the use of mobile devices can be incorporated in the classroom by teachers and professors as well. The objective of this research is to show that the use of smartphones, tablets and laptops during class sessions is something necessary and that it should be incorporated as a practice in classrooms. The methodological approach is qualitative; There are 63 people as study subjects, who are divided into fourteen focus groups. There are three essential results: 1) it is inevitable to incorporate mobile devices as work tools in classes; 2) devices are allies of learning if they are used properly; 3) technology must be integrated into current educational contexts. The main discussion focuses on understanding that mobile devices are an essential component and those are part of the students. As a conclusion, the prohibition of mobile devices isn´t a viable option, on the contrary, the teacher must have the ability to include them within the sessions and make them a tool that promotes the learning process. teaching and learning, that is, education needs to be updated and accompany this renewal from a point of view that integrates technology with innovative education.

Keywords: mobile devices, learning, teaching, students, teachers, innovative education.

Resumen

Este texto se desarrolla porque busca comprender cómo se pueden incorporar en el aula nuevas pedagogías basadas en el uso de dispositivos móviles. El objetivo de esta investigación es sustentar que el uso de smartphones, tabletas y laptops en el salón de clases es algo necesario y debe incorporarse como una práctica lúdica en los salones de clases. El enfoque metodológico es cualitativo; se tienen 63 personas como sujetos de estudio, las cuales se dividen en catorce grupos focales. Hay tres resultados esenciales: 1) es inevitable incorporar dispositivos móviles como herramientas de trabajo en las clases; 2) los dispositivos son aliados del aprendizaje si se utilizan de forma adecuada; 3) se debe integrar la tecnología en los contextos educativos actuales. La principal discusión se enfoca en entender que los dispositivos móviles son un componente esencial que forma parte del estudiantado y del ser humano y que su uso es cada vez mayor. La conclusión es que prohibir su uso no es una opción viable, al contrario; el docente debe tener la capacidad de incluirlo en las sesiones y hacer que se convierta en una herramienta que fomenta el proceso de enseñanza y aprendizaje, es decir, la educación necesita actualizarse y esa renovación debe abordarse desde un punto de vista que integre la tecnología con la innovación educativa.

Palabras clave: dispositivos móviles, aprendizaje, enseñanza, alumnado, profesorado, innovación educativa.

1. Introduction and state-of-the-art

Increasingly, the incorporation of Information and Communication Technologies-ICT has had more importance as tools to support university life, specially at the undergraduate level (García *et al.,* 2018). In this sense, currently, it is unlikely to think of an academic training process 100% without digital advances and interconnection, because talking about a disruptive education involves the use of mobile devices and other electronic and pedagogical resources that strengthen learning and teaching (Peñalosa, 2020).

On the other hand, educational innovations undergo changes that move from traditional models -based on professors - towards a treatment focused on active learning, which is linked to real experiences and close to practice and that demand skills according to the new roles of both students and the teaching staff (Bailey and Ford, 2023); so the promotion and encouragement of educational disruption and innovation is a relevant strategy for Higher Education Institutions -IES- (Quintero, 2017).

Thus, education changes and both professors and students must adapt to the new schemes demanded by IES; these roles have been transformed because of educational processes and should be perceived as something positive that can generate positive changes (Navarrete and Mendieta, 2018). On the one hand, professors must adapt to the use that young people give to devices, and on the other, it must be understood that today's young people are born with a range of available ICTs; therefore, there must be a balance in the classroom for their use. For students, what is normal is to be *online* and having the devices at hand, which makes them more comfortable, which further validates the incorporation of technology in the classroom (McMullan, 2016).

As for the interaction of students in the classroom, this can be enhanced if devices are used intelligently to dynamize the role it plays in the class, i.e., to create an environment in which students are able to interact immediately and be an active part of the educational process; the above, potentializes the retention of knowledge and dynamizes the relationship between student and professor.

Regarding ICTs, it should be mentioned that they are used for virtually everything from work to leisure; with a significantly high percentage of users who are permanently connected to the services offered by the devices, so the educational system must take advantage of the multiple advantages that ICTs offer in different academic fields. In fact, the *smartphone* is the most used tool by students, for this reason its use in the classroom cannot go unnoticed (Fernández, 2019).

Smartphones have become the common within the classrooms; however, formal and institutional agreements have not yet been established regarding their use; and the guidelines depend on each educational institute, professor, subject, educational plan, etc. Finally, and to have a more appropriate delimitation of what is considered as a digital mobile device, the term of Ramírez (2012), is used who defines it as a processor with memory with various forms of input, understand keyboard, screen, buttons and output forms (text, graphics, screen, vibration, audio, cable).

Once contextualized what happens in relation to the use of digital devices in the classroom, educational innovation, the roles of students and professors, it is possible to mention that the purpose of this study is to sustain that mobile devices are necessary to strengthen and promote teaching and learning processes at higher level, in addition to ratifying their importance to strengthen educational innovation and new pedagogical techniques.

Innovation is essential to create proposals that formulate new training styles that boost the quality and functions of teaching and learning. Therefore, it is necessary to understand its components, the roles of those involved and the possibilities of use (Cueva, 2020). Precisely, within the educational level, innovation can be represented at different levels ranging from pedagogical, to administration and professionalization and updating (Valenzuela, 2017). Therefore, it is said that education -at any of its levels- cannot do without innovation, as this is one of the elements that best adapts to the characteristics of students. In short, educational innovation can be defined as any evolution - in any of its ways - that strengthens the teaching and learning process; in addition, it is considered as an intervention where the object of innovation is pedagogical techniques or teaching methodologies (Vieluf *et al.,* 2012).

In this way, innovation is associated with three basic aspects: novelty, creativity and improvement, i.e., innovating involves the creation of something unconventional that results in an improvement in

a context, for problem solving, in strategic analysis or processes, among other areas (Valencia and Valenzuela, 2017). Therefore, innovations in educational institutes take place in the classroom, outside it, in teaching practices, in pedagogies, in the curriculum, in academic programs and in different fields that enable transformation. Finally, it should be noted that currently there is not enough literature to complement the use of mobile devices in the classroom, hence this text aims to contribute to knowledge on these topics.

1.2 Pupils / professors in education

IES are faced with approaches that seek to modify their perception, where student-centered learning is the prevailing approach. Therefore, the professor must build a new role where he/she guides the student towards the development and acquisition of diverse competences that help him/her to develop in personal and professional situations. Directly, the work of professors is not limited to the present and provide knowledge, it involves assuming leadership before the group to design schemes that allow transmitting and advising students in the discipline that corresponds (Lomelí, 2016).

Thus, one of the challenges facing the teaching staff is to attend to the educational needs of students (Cardona and Barrionuevo, 2020). Individual differences in learning and the implications they have for effective education are the subject of both research and innovation programs aimed at improving educational quality, which, on the other hand, in each time and social moment have had different connotations (Perez, 2019).

For all of the above, professors must have an adequate use of ICT and thus create different teaching resources, which must be based on the characteristics and needs of the group/student to which he/she teaches to generate self-learning and achieve the setobjectives (Ausín *et al.,* 2016). This entails a change in pedagogical models and teaching style (Basantes *et al.,* 2017).

Thus, the challenge for professors is to benefit from using digital devices to trigger learning and encourage continuous participation through a didactic use that allows seeing these devices not as a distractor, but as a tool to promote innovative education

and eliminate the concept of traditional teaching (Abreu *et al.,* 2016).

On the other hand, there is the new role of the students, they leave passivity and become active people (Rugel *et al.,* 2015); from a student who only listened to the professor to people able to lead their own learning, i.e., has more participation in all roles of the academy, from researching, to taking arguments and comparing them (Prieto *et al.,* 2014).

There is a concept within the educational field called ubiquitous learning/*U-learning,* which refers to the fact that learning can occur at any time and place thanks to the different portable devices (Burbules, 2012). Specifically, it relies on mobile devices such as *smartphones*, electronic tablets or laptops. This has a direct impact on the type of materials that professors can share, ranging from texts in PDF format, to videos, images, presentations, etc. (Zhao *et al.,* 2010).

It should be noted this topic has been under discussion that since 2010 (Ozuorcun and Savaroglu, 2012). Currently, everyone attending an IES has a *smartphone*. Between 2010 and 2020, this device has become the indispensable electronic device because it facilitates and serves to access information such as a personal computer (Cervantes and Hernández, 2020). Therefore, smartphones can provide tools for students to develop mathematical equations, make projections, communicate immediately, download apps depending on the discipline in which they prepare and thus give a smarter use to these devices.

Thus, the use of mobile devices in an appropriate way can be an innovative contribution in motivating learning during university life (Avendaño *et al.,* 2017). In this sense, it should be noted that the design of virtual educational environments seeks that teaching and learning focuses on developing critical thinking and that is able to adapt from different contexts under a collaborative environment (Flavin, 2017). Using the devices to strengthen learning involves designing suitable activities that contribute to facilitate the work of the student (Fiad and Galarza, 2015). Mobile devices, in one way or another, transform education, as they are a powerful instrument, which are at the service of education and student learning (Shan, 2013).

Some of the benefits for students who must use ICT in the classroom, and particularly mobile devices, is that they help them develop competen-

cies, promote teaching and learning processes and maintain an open, continuous and flexible learning (Garcés and Alcívar, 2016). In addition, it motivates development, group collaboration, critical thinking and reflection.

On the other hand, there has been discussions about the use of these devices in the classroom, and whether they should be approved or not; or, whether it is necessary to have regulated programs, either by the educational institution itself or by the professors who are the authority in the classroom (Suárez, 2018). The reality is that these devices are here and their prohibition is not a solution, especially because the information society includes them (Fragoso *et al.*, 2020).

Ramírez and García (2017) mention that mobile devices modify educational practices by offering personalized independence elements that other technologies have; for example, *smartphones* can collect and modify data immediately that go hand in hand with the appropriate use of the internet, photographs, file transfer, real-time video communication, file editing, etc.

2. Methodology

Scientific research is like any other, only more rigorous; it is systematic, controlled, empirical and critical of hypothetical propositions on the relationships between natural phenomena (Hernández *et al.*, 2020). The research uses qualitative approach because it seeks to answer questions that highlight how the social experience is produced and its meanings. Its contribution is related to the study of complex phenomena difficult to address with quantitative tools, since the proposed instruments do not usually cover the topics presented. This approach is used because of the credibility of its results. Likewise, the quality of anthropological data and their interpretations are assessed from the adequacy of narratives and interpretations with the reality of the perspectives raised by their participants (Duque, 2019).

The study was conducted with the *focus group* tool. This technique consists of sessions with small groups of people where a specific topic is addressed and where knowledge, opinions, beliefs, feelings of what is discussed are investigated (Conejero, 2020).

Now, regarding the scope of this project, the subjects of study were students studying various academic programs at the undergraduate level of a private university in Puebla, Mexico. The population sample was 63 people, of which 37 were women and 26 were men. The age ranges from 18 to 23 years and belong to different undergraduate academic programs that include the areas of Business, Social, Humanities, Engineering and Science. The sample is for convenience and includes all students enrolled in the courses that the researcher taught during the academic period Fall 2022, which represents four courses with the aforementioned total.

Fourteen focus groups, each lasting approximately 20 minutes, were recorded and then analyzed. This process took place during October and November 2022. The groups were as follows: (1) six people (five men and one woman); (2) five people (one man and four women); (3) four people (one man and three women); (4) five people (one man and four women); (5) four people (two men and two women); (6) four people (one man and three women); (7) four people (four women); (8) six people (one man and five women); (9) five people (two men and three women); (10) four people (three men and two women); (11) four people (one man and three women); (12 people (two men) men (two women); and, 14) five peeople (four men and one woman).

The questions asked were:

- Why do you use the phone in class?
- How would you encourage learning and teaching in the classroom using the telephone?
- Do you think the phone is here to stay as a learning instrument inside the classroom?
- Does banning the use of the phone encourage you to use it more?
- What apps do you use most during classes?
- Is there any relationship between cell phone use and interest in class?

It should be noted that prior to the final conduction of the focus groups, two pilot tests were carried out with undergraduate students of other courses to check the effectiveness of the questions and the clarity of the answers; in this sense some changes were made both to the wording of the questions, as well as the number of questions, since at the beginning there were ten questions, and this changed

after performing the validation; from this, the afore-mentioned questions were obtained.

3. Results

Once focus groups are made and each of the student's participations is analyzed, it is possible to summarize the main abstractions generated in these conversations. Thus, and in order to have a clearer idea of the results, the following paragraphs include the comments —paraphrased—, assertions, points and ideas of students regarding the questions raised. It should be noted that the following paragraphs summarize most of the statements made by the student; note that the comments are related to the order of the questions asked.

As a first point, it is important to mention that students resort to the concept in English: *Fear Of Missing Out* - FOMO-; this acronym refers to the fear that users have to miss something that is happening in their social networks, notifications on WhatsApp, or any vehicle of communication and / or contact with their outside. The student comments that this phenomenon is typical of the digital age in which they live; in fact, when carrying out this study, it is found that 90% of the study subjects suffer from this symptom and although not all participants know the term, claim to have this type of suffering.

In this sense, the student affirms that the prohibition of the devices is not the answer to achieve more attention in the classroom, since although they can be removed or saved a withdrawal syndrome can be created which would make them have no interest in the session and only think about what happens in social networks, chats, pages they visit, etc. The participants define that the use of these devices "has become a habit, sometimes we use them unconsciously"; it is one of the phrases that is repeated by the student during the *focus groups;* and it is the subjects of study who indicate that the above is related to the characteristics of the devices themselves, so notifications, according to her words: "force us to see what is happening, especially on the phone, you cannot miss it," the participants say.

However, among the comments obtained by the students, the idea of using mobile devices as part of an inherent custom of the public being studied stands out; especially because it is an instrument that is at hand and easy to use, and its use is immediate,

in fact, it is considered as something instinctive to use them because it is the digital content itself that attracts them. It should not be forgotten that the members of the focus groups mention that digital devices serve as a distraction to break the monotony of the classes, and they perceive it as a *gadget* that helps the sessions to be more dynamic, especially when the classes are very extensive.

However, among the comments repeated in this analysis is that the students admit having little attention to the different topics that are studied in class and therefore resort to the use of the tablet, phone, or laptop, and therefore propose that the classes should implement the use of devices in a playful way and not prohibit them. It is even proposed the inclusion of these as learning tools as long as they have very clear guidelines for their use, otherwise they can become distracting. It should be noted that the focus groups were composed by students who are in different semesters, there are those who are between 2nd and 4th and other groups were constituted by the student who during this academic period ends their undergraduate studies. Therefore, there is a fundamental difference, those who are already finishing the undergraduate program since they work and use the device for work issues and not so much for distraction, and even admit that their own working life has led them to perform tasks from other subjects while attending another course.

On the other hand, the use that is given to the devices is very wide, although they are almost use to check social networks, such as Facebook, Twitter, TikTok, Instagram, WhatsApp and Twitter; another type of use lies in different styles of games or streaming platforms; and to a lesser extent, it is used for educational issues such as Google Drive, or apps that allow to create presentations, texts and spreadsheets and even some platforms of the institution itself. It should be noted that it is difficult for students to approach their devices to consult any of the academic or official platforms of the IES. But there were also respondents who mentioned that any device can be used to corroborate the activities or exercises that should be performed during the class, it also serves as a notebook because they take notes, and even take some photos of formulas, slides or material that professors share.

Likewise, the students affirm that when the content of the course is complex, the device is used

less; in this sense, it can be said that the subject taught in the classroom is a factor that directly influences the use of this type of digital device. However, most respondents mention that the different devices are used by the association of topics that are discussed in the classroom, i.e., the student hears a word or concept and uses the device to know more about that subject; however, sometimes they are inclined to have an academic reason to use it, the distraction itself leads to see other pages and the dissociation is presented by forgetting the real intention and once again social networks come into play.

Many participants point out that when using the device in class it does not mean that they are not paying attention to what the professor says or explains; rather, as strange as it may seem, it helps them to have more concentration on the topics analyzed and this allows them to extract more content. Faced with these aspects, the students also share that sometimes there is no empathy on the part of professors and far from understanding the new learning processes of young people, there is an immediate ban on the use of devices; and in this sense, they point out that sometimes the class schedule directly influences the use of the devices because when they have classes at 7:00am, they need something that keeps them awake and sometimes paying attention in class is not enough.

Therefore, participants propose that agreements be established between both parties regarding the use of these devices to be used for recreational purposes and not only as distractors. It should be noted that regardless of the academic subject, there are personal situations, or possible emergencies, to which participants emphatically indicate it is a sufficient reason to keep the devices close, especially the telephone.

As for the proposals regarding the playful use that can be given to electronic devices in the classroom, the students think that the activities derived from apps like Kahoot or Menti promote healthy competition and help develop a better environment in the classroom, i.e., the use of these tools strengthens the links between students and professors. It should be noted that thanks to this type of tools, communication is also strengthened, and the learning process is perceived as something more dynamic. Focus groups mention that having a device with them encourages research, because students can

search for specific data or topics, which increases knowledge as they complement what is studied in the classes, and as they point out in the conversations "all the platforms we use have access from the phone, so it makes no sense that they tell us not use it, since all the activities are on a platform that you can see from the phone".

In addition to the above, focus groups mention that some of the tools needed for classes are on the phone, i.e. the apps, can solve some of the problems that are asked to be solved during the sessions. In this sense they say that you can edit videos, solve mathematical equations, photograph, scan QR codes, record testimonies among many other actions that can be done with the *smartphone*, and that limiting their use would be contradictory, especially because "we are in an era where everyone is connected to everything, and many answers are in apps or on the internet"; something mentioned in some sessions.

One point that the students point out is that professors must be trained to know what kind of applications they can use, because nowadays many things can be solved with an app. The comments of the participants of the focus groups focus on the fact that if professors are prepared and understand that with mobile devices they can create more innovative learning processes, these tools do not become a distraction tool, but a powerful working tool that can help them in many of their school activities. They even mention that there are assessments and exams that can be solved from *smartphones* and that they can easily qualify and/or know the result.

Finally, the students indicate that there may be a directly proportional relationship between the use of the device and the attention that one has in class or in the complexity of it, for this reason they propose that the sessions be more dynamic and challenging, since professors cannot expect that during the 90 minutes of the class, they will have 100% attention to what the professor explains. Thus, the problem is not mobile devices, but the use that students give to it inside the classroom, so there must be a balance between applying the appropriate strategies to have a positive impact on the educational process.

Thus, once the results are obtained, it is possible to admit that mobile devices are tools that offer new spaces for educational processes. From the intelligent use by the students, but propitiated by

professors, it is possible to draw a correlation with educational innovation, especially in a time of digital mobility characterized by a student who constantly resorts to this kind of tools. Therefore, it is necessary to rethink not only the process that refers to the teaching of classes, and of the pedagogy itself, but to understand that the current generations are immersed in ICT —not always in an ideal way—; but it is the professors who must instruct the students to use them efficiently.

Hence, it is essential to understand that for using digital devices in the classroom it is necessary to have strategies that involve the curriculum, the role of professors, through dynamic sessions in which both professors and students are involved in the teaching and learning process and mobile devices are not perceived as a distraction element, but as a tool to foster better learning and seek spaces in which skills related to technology can be enhanced.

4. Discussion and conclusions

As a result of the analysis carried out, it is observed that the use of ICTs -particularly mobile digital devices- has a fundamental and innovative role in the educational field since it allows the development of knowledge, bonding, teamwork and communication in many of its aspects. Consequently, the objective of this study is fully met, since from the analysis of the results and comparing them with what the theory says, it is verified the importance of mobile devices in higher education and it is achieved to know that the students need to be close to these tools to have a more dynamic learning; removing them from the classroom is not the solution, since in the end, they have become an extension of youth. In this sense, it should be noted that the purpose of this study is to know how it is possible to integrate *smartphones*, tablets, or laptops to the sessions, and this can be established not only in the theoretical framework, but in the results presented from the methodology.

Although there are previous research that discusses the use of devices in the classroom, they do so from an empirical point of view and as a reinforcement of the importance that ICT have today; however, there are few analyzes that are drawn on the usability that devices can have and the emphasis that the students give to these tools themselves, so that

the literature is scarce or null; therefore, the information resources referred to may not be as "current" - more than five years old -, since it seems that there is a stagnation in this class of studies.

There are some interesting relationships that are worth noting. The main is that the educational system faces a somewhat complex reality due to the constant change and progress that are presented in the academic plans, without forgetting, of course, that the IES usually have more responsibility due to the specialization degree provided to the students (Doyle, 2015). As a result, professors are expected to perform various functions effectively and, of course, bring innovation to their teaching practices.

As a primary contribution, this study demonstrates -through a field study- that the students must have the ability to acquire skills that allow them to achieve meaningful learning and critical thinking; furthermore, the prohibition of mobile devices in the classroom is not the solution, but the idea is to find a pedagogical way to use them as a tool of knowledge.

The main limitation of this project is that it is somewhat complex to study the entire university population that makes up the institute in which the analysis is performed; and, in this case, only one sample is studied. In this case, only the positive characteristics of the use of mobile devices are emphasized; however, it is considered interesting to know the negative aspects and consequences in the classroom.

Future studies could include a project in which professors discuss and argue the reasons for prohibiting devices in class, or, where appropriate, make a comparative analysis of the students who use the devices in class, and those who do not use them; another analysis could be more psychological to observe the isolation or socialization behaviors of students as a result of the use of these devices.

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Miscellaneous Section
(Sección Miscelánea)

Diagnosis of school leadership skills in Salesian managers

Diagnóstico de las competencias de liderazgo escolar en directivos salesianos

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Abstract

The importance of school leaders and their skills to face daily challenges requires ongoing reflection and adequate training for those who carry out the educational mission. Extant literature confirms that school leadership exercised by school principals and directors is one of the most important cornerstones for improving student learning. These pandemic times have also required identifying key practices in school management that both contribute to putting students and their needs at the center and affect their learning processes. This paper reports the results of a study carried out in 2020 with 300 Salesian school directors from Argentina, Chile, Paraguay, and Uruguay, countries making up the Southern Cone Region. The study addresses the strategies that the Salesian school of the Americas is developing to promote the quality of its educational centers in the continent. The aim was to assess the degree of appropriation of the managerial competencies by those who work directly in the management of the schools. Based on a quantitative approach, this study relied on an online survey. Results describe the characteristics of Salesian leadership and showcase formative processes that can be strengthened in the coming years and that become more relevant in the context of the Covid-19 pandemic.

Keywords: educational management, denominational schools, skills development, leadership, pandemic, South America.

Resumen

La importancia de los líderes escolares y de sus competencias para afrontar los retos cotidianos requiere reflexión permanente y formación adecuada para quienes desenvuelven la misión educativa. Una amplia literatura confirma que el liderazgo escolar que ejercen los directores y directivos de la escuela es uno de los pilares más importantes para mejorar los aprendizajes. Este tiempo de pandemia ha requerido la identificación de prácticas claves en la gestión escolar que contribuyan a poner al centro a las/los estudiantes y sus necesidades, e incidir en sus procesos de aprendizaje. Este trabajo de investigación presenta los resultados de un estudio realizado en 2020 a 300 directivos/as de las escuelas salesianas de Argentina, Chile, Paraguay y Uruguay, que conforman la región del Cono Sur. El propósito se enmarca en las estrategias que la escuela salesiana de América está desarrollando para impulsar la calidad de sus centros educativos presentes en el continente. El objetivo fue estimar el grado de apropiación de las competencias directivas salesianas de quienes trabajan directamente en la gestión escolar. Se utilizó un estudio de tipo cuantitativo, con la técnica de la encuesta, la cual fue aplicada a través de un cuestionario online. Los resultados describen las características del liderazgo salesiano, dando cuenta de procesos formativos que pueden ser potenciados en los próximos años y que adquieren mayor relevancia en el contexto de la pandemia de la Covid-19.

Palabras clave: gestión educacional, escuela confesional, competencias profesionales, liderazgo, pandemia, América del Sur.

1. Introduction

The purpose of this study is to have an approach to a set of managerial competencies, which have been developed in the framework of the reflection carried out by the Salesian School in America, a network of institutions that brings together more than 950 schools spread throughout the continent. Specifically, this work refers to a study carried out in the South region, where four countries are grouped: Argentina, Chile, Paraguay and Uruguay. To this end, it seeks to answer two questions: Is school management developed in Salesian schools in the Southern Cone with a strong identity? Are these competencies relevant and could they be effective in the context of a pandemic?

Indeed, the scenario that we have been living in for more than a year, and that we do not know how it will end or what consequences it will have for humanity has uniquely challenged our ways and lifestyles and forced to generate immediate responses. As never before, the school context has had to take on the challenge of generating abilities that perhaps very few were developing to sustain the school as an institution and above all maintain its essential educational work. New media, new skills (Carrasco and Jiménez-Cervantes, 2018), new forms of relationship (Cejudo and López-Delgado, 2017) and of communication (Bernal and Cárdenas, 2009), new ways of learning, of transmitting and transferring knowledge (Bozu and Canto, 2009) are here with us, hitting our reality and forcing us to modify our usual and sometimes ossified behavior patterns. Changing and adapting our competences is more necessary than ever, because, as Pope Francis (2015b) says, "we do not live in an era of changes but in a change of era." For this reason, the ability to learn or "*learnability*", considered in the post-pandemic world as a pivotal competence of the 21st century, is insistently required (Karnal, 2021). Educational management, along with the teaching profile, plays an essential role (Sanz *et al.*, 2016; Zabalza, 2009).

Once the Universal Declaration of Human Rights had been enshrined, the right to education had taken a central place, leading to exceptional actions regarding educational coverage and access for thousands and millions of children and young people who had been postponed until that time. Perhaps as a "second wave of progress" this new glo-bal event is forcing us, once again, to radical changes in the way we educate. As Reimers anticipated:

> ...it is not surprising that the question of what should be included in a fundamental education has been and remains being the subject of debate. This includes questions of how much emphasis should be placed on learning acquisition in relation to social and personal development. It also includes issues such as the level at which knowledge should be mastered and skills developed. (Reimers and Chung, 2016, pp.13-14)

On the other hand, it was already evident that the new century brings with it accelerated transformations that impact the reality of educational centers, having to vary their management forms to adapt to the new challenges and new competencies demanded by the current society (Venegas-Jiménez, 2011). Hence, the Salesian School in America must undertake the challenge of developing the school leadership skills of its directors and managers, ensuring the elements of the Salesian charism that sustain it, as well as the appropriate pedagogical training to respond effectively to the commitment to offer a comprehensive, relevant, and meaningful education (Carta Identidad ESA, 2021).

The *Instrumentum Laboris* of the Global Educational Pact (2020), points out that we live in precious times to promote and favor unity in diversity, reconstructing the encounter and seeking to change the usual logic, in which diversity and difference are still considered hostile to unity. If a new humanism is to emerge, it will involve "educating a new way of thinking, one that can keep unity and diversity together," and this may be the first call by Pope Francis to build this global educational compact. This is also confirmed by Unesco, when stating that "the decisions we take together today will determine our common future" (Unesco, 2022, p. 10). School leaders have, in this vision, a relevant role in promoting a new style of working in coordination with others, to achieve meaningful and relevant learning in the current context. It is an invitation to an open dialogue between the leaders of Salesian schools in the Southern Cone to continue to seek unity and the construction of representative parameters in the region.

2. Conceptual Theoretical Framework

2.1 Competences for Salesian School Management

Reality poses permanent challenges to education to ensure progress and the construction of the future. Some visionaries anticipate the changes from the practices, others from the deeper reflections that move in the field of anthropological or philosophical views. But what we have experienced in the last year is an unprecedented blow, from a challenge to an urgent need for personal and collective survival. If the need to glimpse, define and acquire "competencies" was already at work in the transition to the new century, today it is an urgent and immediate task, as much as the incredible effort to produce a Covid vaccine in record time.

Several authors emphasize that to achieve good school management, it is necessary to consider the leadership approach and the distribution of tasks within the School; the modality in which pedagogical management is developed, which makes it possible for all students to learn; the environment of coexistence and relationships, which contributes to a healthy conflict resolution promoting a school culture of high expectations; and a management of results and resources, which assumes responsibility and transparency of achievements and challenges, as well as the balanced use of available resources to ensure all the needs of the school. These are large centers that will allow effective school management and continuous improvement (Barber and Mourshed, 2008; Bolívar, 2010; Elmore, 2010; Pont *et al.*, 2008; Leithwood *et al.*, 2008; Spillane, 2005; Weinstein *et al.*, 2009; Gavilanes and Tipán, 2021).

Regarding these main aspects of good school management, the Central Commission of Salesian Schools of the Southern Cone developed a set of competences that were measured through a questionnaire, considering four nuclei or dimensions, which sought their convergence with important elements of Salesian education, which were defined as: Salesian leadership, pedagogical and evangelizing management; coexistence and pedagogy of the environment; resource management and communion of goods.

2.2 Leadership and educational quality

Multiple studies point to school leadership as a key element to influence student learning. The relevance and impact would be around 25% of all school effects, thus becoming the second most important variable in school improvement (Barber and Mourshed, 2008; Leithwood *et al*, 2006; Marzano *et al.*, 2005). This leadership role in the context of Covid-19 has become even more evident and challenging (Córdova *et al.*, 2021).

This new understanding, which has gradually focused more on the pedagogical than the administrative, has been strengthened by broadening its objectives towards the achievement of effective schools and the development of standards, understanding the effective school as one that "promotes in a lasting way the integral development of each and every one of its students beyond what would be predictable, taking into account their initial performance and their social, cultural and economic situation" (Murillo, 2003, p. 54). Consequently, one of the most important challenges that the leader of the school must achieve is to give quality to the school processes to achieve that effectiveness, consolidating certain key principles: equity, integral development of the student, added value of the school.

2.3 Development of management and leadership skills

The experience in some countries of the Southern Cone, such as Chile, has led to defining ways to enhance the performance of school principals as part of their public policies to promote school improvement. These ways of implementing and strengthening school management processes are found in the Framework for Good School Management and Leadership (2015) and the Indicative Performance Standards for Educational Centers and their Supporters (2014), which are part of the National System of Quality Assurance in Education, "with the purpose of supporting and guiding schools in their process of continuous improvement, and thus contribute to the goal that the country has set to ensure quality education for all children and young people in Chile" (Law No. 20,529, 2011). These documents have been considered in the elaboration of the Salesian Powers (2019).

2.4 Context of this work: Salesian School of America (ESA)

Since the IV Continental Meeting held in Medellín, Colombia, in 2017, the Salesian School in America (ESA) has posed a set of challenges to encourage school processes from the charismatic identity that sustains and promotes the educational mission. Among the axes of development is the "Qualification of the Pastoral Educational Proposal in Salesian Schools", whose one of its goals is "Qualify the animation, management and accompaniment of works from the strengthening of the shared mission between religious and laity" (Sepsur, 2019). In the framework of this work, the commission of Sepsur Escolar, formed by the representatives of the education sector of the Salesian Congregation (SDB) and the Daughters of Mary Help of Christians (FMA) of Argentina, Chile, Paraguay and Uruguay, worked on the development of a set of management competencies with the charismatic view, having as general reference some elements present in the Performance Standards of Centers of the Ministry of Education of Chile, as well as documents of both Congregations.

2.5 Competency Management Model for the Salesian School in the Southern Cone

This work is a sign of this new way of thinking that schools need to shape a global education at different levels and experiences, taking on the challenges in Latin America (Aldana-Zavala *et al.*, 2021). Each dimension contains a description that allows understanding the areas that compose it and a set of competencies that contemplate the Salesian style of action. The definition of competency was the "set of knowledge, skills and attitudes that, when applied in the performance of a given responsibility or professional contribution, guarantee a good achievement" (Sagi, 2006, p. 86). Therefore, a competence is composed of three interrelated elements. The *knowledge* that involves knowledge; *know-how* that corresponds to *skills*; and *the* ability to do *that corresponds* to *attitudes*.

The dimensions described below led to the construction of the Instrument applied to the management of Salesian schools in the Southern Cone.

Dimension 1: Salesian leadership. It includes the functions of design, articulation, leadership and institutional planning, all aimed at ensuring the conduction of the Pastoral Educational Project. The Salesian leadership has an animation style, which "does not consist only in a technical and functional action: it is spiritual, apostolic, pedagogical and has its source in pastoral charity. To encourage is also to govern, manage and organize" (SDB, 2014, p. 261).

Dimension 2: Teaching and Evangelizing Management. The competencies of this dimension include the criteria for organizing, administering, supervising, and promoting pedagogical and evangelizing management, so that the Animation, Management and Accompaniment Team of each school promotes and guides the institutional leaders so that teaching strategies are appropriate, and learning takes place in the framework of the Pastoral-Salesian Educational Project.

Dimension 3: Coexistence and Environmental Pedagogy. It refers to generating an "organized and rich space of proposals to make life and increase hope in women and young people. It mediates between the values inspired by the gospel and the "socio-cultural context" from criteria defined by the Preventive System (FMA, 2005, p. 92). "Importance is given to the way of offering the signs of the Gospel in everyday life, paying attention to authentic relations and communications" (SDB, 2014, p.107).

Dimension 4: Resource Management and Communion of Goods. It includes the procedures and practices aimed at having the necessary work team, financial, material resources and external networks, for the proper implementation of the Salesian educational proposal, which invites to analyze the efficient use of resources with oratorical criteria, spirit of collaboration, creativity, and sense of belonging.

3. Methodology of the study

For this descriptive quantitative study, the management teams of Salesian schools in Argentina, Chile, Paraguay and Uruguay were considered as the universe. They constitute 219 schools, of which 38% belong to the Congregation Instituto Hijas de María Auxiliadora (FMA) and 62% belong to the Salesians of Don Bosco (SDB). The probabilistic sample included the participation of 300 managers, with a random selection of participants who responded an online instrument (LimeSurvey). Data were collec-

ted during the months of October to December 2020. The research finds limitations because the answers obtained are not in proportion to the percentage of schools in each country, so this paper presents an approximation to the subject of study, but we cannot infer the results to the entire population of Salesian schools nor to the general context.

The 27 variables studied correspond to the skills developed for the different essential dimensions of the Salesian school. These dimensions and competences were built collaboratively, defining the following constructs: Salesian Leadership; Pedagogical and Evangelizing Management; Coexistence and Environmental Pedagogy; Resource Management and Communion of Goods. For the applied instrument, an online questionnaire was used, with an adaptation of the competencies, which were measured with 5 categories of response: (1) Very little developed; (2) Little developed; (3) It is mediately present in daily practice; (4) Developed; (5) Very developed.

Through an *Exploratory Factor Analysis*, it was found that there is sufficient correlation between the variables (0.5), as well as in the KMO test, which is interpreted similarly to the reliability coefficients, i.e., with a range between 0 to 1 and considering as adequate a value equal to or greater than 0.70, which suggests a satisfactory interrelation between the items (Hair *et al.*, 1999). In this case, the KMO value is 0.87, which allows further analysis.

4. Results

4.1 Participation and trajectories

As indicated in Table 1, the highest participation percentage is in Salesian schools in Chile (48.2%), followed by Argentina (36.8%). Paraguay and Uruguay only collect 15 % of the sample. 67.6% were women and 32.4% men.

The data obtained were treated in general terms, without differentiating countries, but as a whole.

Table 1. *Participation by country*

	Percentage
Argentina	36,8
Chile	48,2
Paraguay	5,0
Uruguay	10,0
Total	**100,0**

Table 2. *Years of experience in the institution or educational establishment*

	Percentage
From 0 to 5 years	20,4
From 6 to 10 years	14,0
From 10 to 15 years	14,4
From 15 to 20 years	11,4
More than 20 years	39,8
Total	**100,0**

As for the trajectory of the participants, it is observed that most are in the 20-year or more working experience at the Institution (39.8%), and between 0 and 5 years with 20.4%. The rest is distributed similarly in the intermediate sections. In other words, the management positions of Salesian schools in these countries have been entrusted mainly to people who have a long trajectory in the school, indicating more affinity to the degrees of institutional commitment and knowledge of the schools from

within. However, the range between 0 to 5 years in the Institution, reflects interest and need to prepare new generations in the challenge of school leadership. However, 50% of the sample has been working in the Educational Center for 15 years or more, indicating a prevalence of the value of the trajectory for selection to positions of trust.

The shared mission between religious and lay people is a reality that is becoming increasingly consistent, with a strong confidence given by the Religious Congregations to the task that lay people can develop—professionally and charismatically—in schools. As seen in Table 3, lay people participating in school management account for 91.6% of the total number of people enrolled in this study, while 8.4% are religious and priests.

Table 3. *Participation of religious and lay people*

	Percentage
Religious	7,4
Lay	91,6
Priest	1,0
Total	**100,0**

This implies that the formation processes of laity must be a priority in these religious provinces, to give a stronger foundation to the school management from the principles and characteristics of the Salesian leadership and with the competencies demanded by society to face the challenges of the school organization, especially directed to effective learning processes.

Regarding the age of the participants in this sample, it is noted that there is a balanced distribution between them. However, most managers are between 50 and 59 years old (36.1%) and between 40 and 49 years old (30.8%), which is consistent with the average age of principals in Buenos Aires, Argentina and Chile in the Talis Report, being 52 and 53 years old, respectively (OECD, 2019).

Weinstein *et al.* (2014, p. 6) point out that:

> The leadership in Latin America is mostly held by women and the directors have an average age of 44 years, although in both cases a wide dispersion in these variables is present in countries such as Uruguay or Argentina with more than 85 % of women directors, compared to Mexico or Ecuador in which they would represent less than half, as well as average ages ranging from 39 years in Guatemala or Nicaragua to 53 years in Chile.

Although this sample brings together not only directors, but other members of the management teams, *gender* and *age* agree in the managers of Salesian schools with a greater tendency towards women in these positions and age ranging between 40 and 59 years.

Regarding the *correlation between sex and years* of trajectory in the Educational Center, the percentage of educators who have more than 20 years in the same institution is highlighted, followed by a second majority in the opposite section, i.e., educators who are starting working at the school (table 4), which is interesting due to the importance of achieving a good accompaniment of these people to ensure the development of competencies demonstrated in management: cognitive, procedural and affective domain, which allows them to have a medium term trajectory, considering that people do not seek to stay long time in an Institution, but they value the years, benefits and professional experience they manage to perform in one place.

> The new binder will be composed of commitment, motivation for achievement, development and professional growth coupled with economic benefits, shared leadership, personal self-esteem, recognition of success and personal relationship. (Álvarez, 2013, p. 198)

It is confirmed that most of the managers have a long career in their educational centers (more than 20 years), where 73.3% are women and 26.7% are men.

Table 4. *Bivariate analysis Sex * Years of experience in the institution or educational center*

	Percentage
Religious	7,4
Lay person	91,6
Priest	1,0
Total	**100,0**

4.2 Socioeconomic context

According to this study, the socio-economic level served by Salesian schools in the Southern Cone, as shown in table 5, concentrates most in middle-lower sectors with 63.2% and, in general, 99.7% in contexts with some level of vulnerability. This indicates that the Salesian educational mission is responding to the needs of children, adolescents, and young people from the popular sectors, which are the main objective of the Salesian educational-pastoral project.

At the same time, working in vulnerable contexts is a challenge for the Salesian school for improving its practices to become an effective school that offers integral quality, characterized by providing a school culture with high expectations for its students; with a management focused on the pedagogy where children, adolescents and young people are the center of their action; a management and technical leadership with clear and prioritized goals; a school that makes parents trust, create and value the work that the school performs and recognize in it a hope for better opportunities and social mobility for children. This is shown by a study conducted in Chile in 2004, where a solid relationship between *effectiveness and vulnerability* is established by inves-

tigating the common factors of schools with good school results and students who come from high social marginalization conditions (Pérez *et al.*, 2004).

4.3 School effectiveness and the global educational pact

The Global Education Pact, promoted by Pope Francis, invites all school actors to form an education able to focus on people, creating a network of human and open relationships, to form people who are at the service of the community. This call is a new way to improve the effectiveness of schools, because as pointed out in the Encyclical "Laudato Si" (2015a), "education will be ineffective and its efforts will be sterile, if it does not also seek to spread a new paradigm about the human being, life, society and the relationship with nature" (No. 215). Therefore, Salesian education must make a commitment to this new paradigm, which in turn finds its full foundation in the vision of the founders, San Juan Bosco and Santa María Mazzarello, and the Preventive System that gives life to the educational mission.

In the following figure, each dimension is observed with the respective competencies associated with it.

Figure 1. *Dimensions and competencies of Educational Sepsur*

| Dimension 1: Salesian leadership | Developing an optimistic vision for young people | Innovative proposals based on reality | Moves CEP* towards integral formation | Acts from the Pedagogy of Jesus the Good Shepherd |
| | Works collaboratively and in network | Boosts professional and charismatic qualification | | |

| Dimension 2: Teaching and evangelizing management. | Coordinates the curricular pedagogical project | It generates in teachers attitudes of listening and reflection of the youthful reality | Promotes the training and self-training of teachers | Promotes classroom experiences that stimulate meeting and bonding |
| | Favors accompaniment with the style of the Good Shepherd | Oratorian approach and preferential option for the poorest | Promotes student ownership | Favors active and constructive methodologies |

| Dimension 3: Coexistence and pedagogy of the environment | Promotes relationships and bonds from the oratorian approach and the family spirit | Empowers the care of the other through dialogue, kindness and listening | Promotes co-responsible participation of CEP members | It expresses joy and closeness by building trust |
| | Promotes youth training and socio-political participation | | Values and promotes inclusion | Takes care of the relationships with families and the environment |

| Dimension 4: Resource management and communion of goods | Implements strategies that promote a mature sense of ownership in the CEP | Manages resources for professional and technical staff development | Selects staff according to protocols that safeguard suitability | An annual budget consistent with the PEP is drawn up together with the administrations** |
| | Ensures resource planning for school maintenance and improvement | Seeks support networks strategically | | |

*Pastoral Educational Community
** Pastoral Educational Project

4.4 Results by competencies

In terms of the averages obtained by each of the competencies in general, these correspond to: Salesian leadership (91.8%); Pedagogical and Evangelizing Management (87%); Coexistence and Environmental Pedagogy (89.6%); Resource Management (75.4%).

Competence 1, representing Salesian Leadership, is the strongest among the competencies (91.8%), with a score of over 90% in most indicators. The least achievement in this competence corres-

ponds to *promoting professional and charismatic qualification,* promoting self-reflection, self-assessment, and professional development at all levels, especially with teachers (82.33%).

Competence 2, referred to the Pedagogical and Evangelizing Management, reaches 87% on average. The indicators with the lowest score are: generate in teachers attitudes of listening and deep reflection of the youth reality to achieve meaningful learning (87%); With my role I favor the training and self-training of teachers in their own discipline from the Salesian pastoral theological framework to contribu-

te to the development of an evangelizing curriculum (80.14%); With my academic role I provide active and constructive methodologies that contribute to answer significant questions and create solutions to real problems; the conditions of possibility are created, so that the elaboration of the curriculum project is marked by the oratorian criterion and stressed by the preferential option towards children, poorer children, adolescents and young people (80.67%).

Competence 3: Coexistence and Environmental Pedagogy, reaches an average achievement of 89.6%. The aspect that stands out for its low score is the one that refers to proposing strategies to promote the formation and the socio-political participation of young people (73.33%). This shows an important challenge when designing strategies for developing active citizenship competencies in students. Another weak aspect is to promote strategies to strengthen relationships with families, the environment, the context itself and with other institutions (87.33%).

Competition 4, which deals with the Management of Resources and Communion of Goods, has the lowest average among the set of dimensions addressed, reaching 75.4%. One aspect that can be strengthened is that of *assessing the family climate annually and/or biannually, through surveys or other instruments* (56.33%). According to this result, there are few initiatives related to measuring family context, relationships within the educational community and the participation of all stakeholders involved. This can be considered a challenge to permanently encourage the care of the organizational environment in a Salesian context.

A second indicator to consider is whether managers use the results to implement improvement processes in the work environment (69%). In accordance with the previous indicator, it is important that the management team favors a good environment in which the human resources of the school develop, and therefore, can have tools to diagnose and implement improvements, thus ensuring that those who carry out the educational work, feel committed and stimulated to give their best.

Based on the data presented and the most urgent challenges in this context of health emergency, finally the answers were analyzed considering three key themes for school management: *Collaboration and pedagogical leadership* (Mesa Social Covid-19, 2020; Honigsfeld and Nordmeyer, 2020); *socio-emotional reconstruction and relationships* (Education 2020; OECD, 2020; Céspedes, 2020; López, 2020; Unesco, 2020); and *professional development* teacher (Keti, 2019; Sosa and Valverde, 2019; Darling-Hammond and Hyler, 2020). A set of indicators was linked according to the themes, which yielded averages of 89.3, 87.2 and 85.14%, respectively. This shows that collaboration and leadership has been the most important, followed by socio-emotional reconstruction and finally teacher professional development, one of the main aspects to address the process of changes and adaptation to new ways of teaching-learning in this pandemic.

5. Discussion and conclusions

This study is the first one related to Salesian management skills that is carried out in the region and among Salesian schools in America. Therefore, it is not possible to compare their results with other similar works. This opens a way for further research on the subject in this set of schools in the region and the continent. However, the data obtained can be a valuable contribution to continue advancing in a common language among the participating countries, as well as the joint search for coordinated training opportunities for their school leaders, through online and/or face-to-face classes.

There are coincidences among other studies applied in the Latin American context, with respect to the main presence of women in management (Weinstein *et al.*, 2014), which is important as a trend that is also confirmed within the Salesian schools of the Southern Cone.

The results of the instrument show satisfactory indicators (about 85 %) in three of the dimensions evaluated. It is possible to indicate that there is a clear identity in most of the managers surveyed, standing out the dimension of Salesian Leadership, and being as the weakest the competence referring to the Management of Resources and Communion of Goods. This can be an interesting path of training and agreements to strengthen this competence which is an important element in the sustainability of schools.

The results of the research show that the Salesian managers of the four countries studied are familiar with the proposed competencies, since there is a degree of development that can be enhanced in

all of them if the region represented reaches consensus regarding what to train in the new managers and how to involve them in the development of effective practices from the Salesian charism. The formative dimension could be strengthened if it is taken together, generating a more concrete and significant network of what exists today between countries. Special attention should be paid to competencies linked to resource management, which is the weakest.

Regarding the relevance of this set of Salesian managerial competencies in the current pandemic scenario, it is possible to determine important links between indicators of Salesian managerial competencies with pedagogical leadership and collaboration, as well as in the socio-emotional and relational reconstruction and professional development of teachers, very important in this period of distance education, where organization, monitoring and efforts to face the digital era represent a challenge for the school.

In terms of the relational dimension and the professional development of teachers, the region requires promoting greater qualification and exchange of good practices among managers, which necessarily implies focusing human and economic resources, putting at the center the continuous improvement of learning and the integral growth of students, especially as these correspond to contexts of vulnerability. Deepening on the charismatic elements from the Preventive System, there should be a permanent strategy to train the leaders in a Salesian view of reality, as well as to ensure the training of managers with few years in office.

Consequently, lifelong learning, understood as *learnability*, is necessary in the management teams of Salesian schools, in all age ranges and trajectories, because the world in which education is developed today requires continually leaving "the comfort zone" to learn, unlearn and relearn. The big differential for today's and tomorrow's professionals is the intentional ability to learn, adopting a growth thinking, which is built in dialogue with others. This internal dynamism and the constant search for new educational responses for children, adolescents and young people is undoubtedly the hallmark of Salesian identity.

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Distance Vocational Training for employability in Spain, Portugal and Dominican Republic

Formación Profesional a distancia para la empleabilidad en España, Portugal y República Dominicana

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Abstract

Vocational Education and Training aims at developing students' knowledge and skills for insertion in the labour market. Portugal is currently redesigning its model to meet the new demands of the economy, society and business. In Spain, a major transformation has taken place with a focus on initial and continuous teacher training, as well as the design and implementation of a new legal structure for the organisation and integration of Vocational Education and Training, while the Dominican Republic is working on the adoption of a more practical and experiential training model. This study determines the key aspects to ensure the development of a new, more personalised instructional model based on the development of individual competencies, potential and talent. A qualitative methodology has been used through an integrative and interdisciplinary literature and document review. The results show that there is a great diversity of models and specializations worldwide, which makes the internationalization of Vocational Education and Training relevant to broaden discussions on the subject within the current context. As a conclusion, the pillars for a comprehensive training strategy have been identified.

Keywords: Vocational Training, distance training, employability, Dominican Republic, Spain, Portugal.

Resumen

La Formación Profesional tiene como objetivo el desarrollo conocimientos y habilidades de los y las estudiantes para la inserción en el mercado laboral. En la actualidad, Portugal está rediseñando su modelo para responder a las nuevas demandas de la economía, sociedad y empresa. En España se ha realizado una gran transformación poniendo el foco en la formación inicial y continua del profesorado, así como en el diseño y la implementación de una nueva estructura legal para la ordenación e integración de la Formación Profesional, mientras que República Dominicana está trabajando en la adopción de un modelo formativo más práctico y experiencial. Este estudio determina los aspectos clave para garantizar el desarrollo de un nuevo modelo instruccional más personalizado basado en el desarrollo de las competencias, potencial y talento individual. Se ha utilizado una metodología cualitativa mediante la revisión bibliográfica y documental integrativa e interdisciplinar. Los resultados muestran que existe una gran diversidad de modelos y especialidades de Formación Profesional a nivel mundial, lo que hace pertinente la internacionalización de la Formación Profesional con la finalidad de ampliar las discusiones sobre el tema en el contexto actual. Como conclusión final se han determinado los pilares para una estrategia formativa integral.

Palabras clave: Formación Profesional, educación a distancia, empleabilidad, República Dominicana, España, Portugal.

1. Introduction

The twenty-first century has brought profound transformations in an increasingly digital and global world that constitutes the basis of society, the economy, culture, and business. In this context, Vocational Training (hereinafter VT) has consolidated as one of the pillars of experiential training that students need today for developing competencies and skills to be actively involved in the labor market (Comissão Europeia, 2018).

Young people and adults have great digital skills, although they are mainly oriented towards consumption, excluding higher conceptual and cultural competencies that allow them, for example, to reject false information transmitted online. The great challenge is therefore to train young people and adults with multidimensional and transversal competencies, which not only bring them closer to knowledge, but promote the development of their creativity and critical thinking so that they can be active participants in society and in the use of technologies as a cultural and autonomous belonging (European Commission, 2019).

The main starting points of the new generation of competencies-Partnership for Learning of the 21st Century (2006) such as the reference of the World Economic Forum (WEF) of 2021 and the precedents since 2015, where the categories of knowledge, skills, attitudes, and values that lead young people and adults to action are presented. These competencies include global citizenship competence, multicultural competence, learning and innovation competencies, as well as digital competencies (Figueiredo, 2019) (Comisión Europea, 2018). In this way, Vocational Training is seen as a facilitator of communication while helping and enabling students to acquire numerous competencies to act in the global world —the *savoir être*, the *savoir comprehender*, the *savoir apprendre/faire* and the *savoir s'engager* (WEF, 2015; WEF, 2016; WEF, 2017; WEF, 2018 and WEF, 2021).

The labor market is undergoing a profound restructuring, and many of the professions that existed have disappeared. In addition, the technological revolution will create new professional sectors that in most cases are linked to technology and digital transformation. The World Economic Forum concluded in 2018 that technology could create 133 million new jobs by 2022. Once the pandemic started in 2019, not only professions have changed, but the very nature of work. This paradigm shift is the result of the Fourth Industrial Revolution, driven by disruptive technologies such as automation, artificial intelligence, robotics, virtual reality, or machine learning. For this reason, mastering these skills will become a widely differentiating factor and will make a difference in the professional success of those who now learn them (Delgado-Rodríguez *et al.,* 2023).

Although technological and digital competencies are the greatest differential value, there are other aspects that cannot be neglected by vocational and practical training institutions: communication, interpretation, critical thinking, and the ability to create and innovate, among others. In this sense, it can be said that the new jobs that will emerge, driven by the increasing use of technology in routine tasks, will also require social, logical and behavioral skills that complement the more technical skills (National Research Council, 2012).

During the last decades, there has been an increase in training activities related to Vocational Training. According to data collected by the International Labor Organization (ILO) through its Inter-American Center for the Development of Knowledge in Vocational Training (Cinterfor) in 2017, a total of 23 million students in Vocational Training were reported in Latin America, the Caribbean and Spain, representing 22 % growth compared to 2016 data.

In 2021, 6.1% of students in the Dominican Republic (a total of 670,728 participants) were pursuing studies in Vocational Training, 11.3% (5,317,992 students in total) in Spain and Portugal. It is worth highlighting the employment and digital training measures carried out by the Instituto de Emprego e Formação Profissional (IEFP) under the Employment +Digital 2025 Program, which aims to promote the digital transformation of companies and improve the individual competencies and qualifications of each student in Vocational Training projects. According to IEFP, at the end of 2021 the number of students in Portugal is 1 016 821 of which 87 854 were inserted into the local labor market as a result of public policies around this vocational training.

Vocational training constantly seeks to respond to the needs of the labor market, thus ensuring employability in various areas of training. In addition, it focuses on updating to cope with current

changes in the various current technological approaches (Area-Moreira *et al.,* 2020). In Vocational Distance Learning, both in Spain and in Portugal and the Dominican Republic, it is believed that successful professionals of the future are not only those who master technology, but also those who connect, relate, communicate, include, and think.

For all these reasons, when assuming the mission of training people who can solve the problems of the future, technology must also be adopted to the learning process, beyond a mere tool. It must be the engine that stimulates logical reasoning, enhances autonomy, and offers new ways of thinking and doing, essential to the future that is happening today, in the present. Only the combination of these two universes - on the one hand, technology and, on the other, transversal competencies - can mean a smiling future to all those who are taking or will soon take their first steps in the labor market (García *et al.,* 2011).

This academic article presents the results of a research on the impact of remote application and vocational training in Spain, Portugal and the Dominican Republic, as key aspects to access the labor market. A methodology of literature analysis, language and structure has been approached, which can be differential factors since research has been conducted in Spanish and Portuguese, contributing to the adaptation of these languages, and contributing to society in general, and providing a comparison of the reality of the current topic, thus contributing to the knowledge of the area of study and originality in topics of Vocational Training.

2. Methodology

This study addresses the different perspectives and trends of Distance Vocational Training with a focus on employability and from a comparative analysis between Spain, Portugal and the Dominican Republic. The objective is to determine how this educational model is applied in a representation of Europe and Latin America to obtain an overview of the impact on the acquisition of competencies and skills to improve employability.

The methodology used for the study is documentary analysis focused on data collection, depth of information techniques and analysis of documents and reports to select, compile, organize and interpret information from this training (Mira *et al.,* 2004).

It should be noted that it will be the basis of a new phase of qualitative analysis research based on the theoretical foundation to know and deepen the key aspects in each country for the development of vocational training (Castro and Castro, 2002).

Documentary research was conducted based on Bisquerra (2012), using systematic procedures and objective description of the content. From this procedure, some words related to Vocational Training, inclusion and employment that are frequently used in the literature were identified, and a study was conducted based on the frequency of these words. Then, after recognizing the words, the frequency of words corresponding to the investigated terms was counted. These terms were categorized in tables according to their location in the document, once the analysis and tabulation of the data was completed, the material was explored from the frequency of appearance of the terms, the distribution and the arguments described in the course and the analyzed documents. Subsequently, the text went on to a second stage of analysis.

The main bibliographic sources that support this research allow analyzing and reflecting on the importance of distance vocational training and the impact it has on the development of skills for the global labor market. It is therefore intended to identify good teaching practices and didactic strategies in distance learning that allow acquiring skills and promote employability from an international perspective (Loayza, 2020; Aguelo *et al.,* 2022).

The main literature consulted and the backbone of the research was based on Negri Cortés and Leiva Olivency (2016) on Vocational Training, Inclusion and Employability; Nieto *et al.* (2022) have provided an approach to skills as key to success; and Moreno Marquez (2021) has based on the proportional relationship of excellence and quality of Vocational Training with the improvement of employability in Spain, and the Dominican Republic and its current trends and perspectives.

3. Vocational Training

Vocational training seeks to enhance the appropriate skills so that students can respond to the demand of the labor market. Such training is geared towards the performance of specific work activities. It can be acquired through formal education, techni-

cal or various training, being an alternative for people who have been able to access a university education and want to develop their skills in the labor market or upgrade to improve their current jobs or improve their employment opportunities.

Some of the most common areas include information technology, business management, health, manufacturing, hospitality, and others.

Today, Vocational Training is not seen by the art of knowledge, but reflects its practice in acting, intervening and facing the various situations that may locate us in the different spaces where the professional has to develop his/her career and solve everyday situations. Therefore, today we are looking for a professional who is willing to adapt to the different situations, today we need a person who when training has an attitude to face the challenges that arise in the future; for this reason, the training should help him/her to learn and apply the knowledge acquired in the world of work (Alonso Betancourt *et al.,* 2020)

Vocational training has a practical and theoretical reality, where people are trained with the purpose of introducing knowledge to the professional field. New times require more demand in Vocational Training, since when students graduate from High School, it is Education or Vocational Training the one that would give answers to the productive needs and services based on the needs of society (Oliva Feria *et al.,* 2019; Cabanillas García *et al.,* 2019).

3.1 Remote Vocational Training

Technological advances have brought about changes in working methods and the emergence of new professions. It is increasingly important to keep up to date to improve our technical, digital and technological competences. In this sense, training and specialization courses are an excellent option to stay competitive in the labor market, increase our chances of being hired and improve the development of our career (Area-Moreira *et al.,* 2020).

Today, training centers are increasingly introducing certified online training solutions that are tailored to the needs of their participants and enable in some cases more personalized education.

Due to the Covid-19 pandemic, E-Learning and B-Learning have gained popularity in teaching, learning and professionalization modalities.

E-Learning continues to use, in some cases, tools and applications from the world of E-Learning 1.0 (unidirectional), which may limit access to information. However, in the case of E-Learning 2.0 (bidirectional), a greater connection is established between the participants in the learning process.

In this context, some efforts towards the use of E-Learning 3.0 (collaborative and cooperative) are already visible, linking more easily knowledge and 4.0 (bidirectional), which links people, connects shared knowledge between data elements and establishes a context for elementary reasoning. In other words, intelligent environments with certain semantic skills and guided by distributed information and knowledge systems, which use totally innovative scenarios, contexts and environments and promote communication and interaction in a virtual classroom situation, by connecting real-world and virtual devices in real time with people (Gutiérrez-Martín *et al.,* 2022).

Both E-Learning 3.0 and E-Learning 4.0 are learning methodologies that are conducive in the context of distance learning, because they allow the creation of scenarios and didactic strategies that contribute to lifelong learning and the creation of learning communities by allowing different people to communicate and interact in real time and space, as well as the exchange of knowledge in a collaborative and cooperative way that, consequently, help the employability of the students coursing the distance modality.

On the other hand, B-Learning in distance vocational training for employability is a concept that plays an important role in higher education because of its flexibility and has gained, in recent years, a greater role in during Covid-19 pandemic (Carrascal *et al.,* 2020).

The agents involved in the training processes soon realized that it made perfect sense to use B-Learning as a way to stimulate student interest. The emergence of other didactic and pedagogical forms, not only the lecture, took place in the classrooms and educational centers as a common thing and a necessary resource in the planning of the trainers.

Vocational training is increasingly focused on the student and his/her learning experience; for this reason, training must be oriented and personalized. The student must be an active part of the teaching and learning process and it is for this purpose that B-Learning integrates didactics. Thus, this formative

modality arises from learning that results from different methods, techniques and instruments in a way that consolidates collaborative and inclusive learning (Feliz Rosario *et al.*, 2022).

For technology to have a significant impact, it is necessary to understand the didactic and pedagogical implications to ensure that both the training provider and the trainers are prepared to face this reality. In the case of B-Learning, it is necessary that the trainer has certain skills to be a good coordinator and teacher moderator in the physical room, but also in the virtual room, being fully aware that the student is an increasingly autonomous individual, independent and responsible for his/her learning, able to create his/her own meaning and valuing his/her opinion and choice. These aspects are essential for creating a culture in distance learning, valuing B-Learning as a didactic strategy that promotes critical thinking and the practical application of knowledge, essential for professional performance today.

Therefore, the extension of the training classroom to the virtual or online space has become a reality increasingly used in Vocational Training, where students and trainers must necessarily take a more active role in the development and dissemination of didactic content, enhancing their pedagogical action and contributing, at the same time, to the acquisition of essential competences at a personal and professional level (Aguirre Aguilar, 2020).

According *to* Santos *et al.* (2014), there are some advantages, both for e-Learning and B-Learning, of using an LMS platform, and take them them to Distance Vocational Training, which is increasingly closer to the designs of the labor market:

- It innovates in the processes of training and education, allowing the continuous acquisition of new knowledge (Lifelong Learning).
- It eliminates the problem of geographical dispersion of young people and adults.
- It allows greater flexibility, differentiated study rhythms and personalization of learning.
- It removes spatial and temporal barriers, opening up training pathways for people who have difficulty moving or studying.
- It stimulates self-learning, allowing a continuous personal development of individuals, giving them more autonomy.

- It encourages the continuous acquisition of new knowledge.
- It optimizes resources with significantly reduced training costs, especially in time, travel and on-site.
- It guarantees and encourages experimentation and familiarization with technology and new telematic services.
- It enables a large number of people to be trained in a short space of time.
- It allows the successive repetitions necessary for studying the subjects.
- It enables a rapid return on investment (ROI), especially for a large number of students.
- It makes content more appropriate and attractive, especially those presented in multimedia format, allowing the development of new skills very important for the labor market.
- It allows for the reconciliation of learning, professional activity and family life.
- It equals training opportunities appropriate to the needs of a given population from an inclusive perspective (excerpted from Santos *et al.*, 2014, pp. 22-23).

The advantages mentioned are the basis of the paradigm shift in distance vocational training for employability, able to stimulate young people and adults for inclusive and continuous teaching and learning. Breaking paradigms in the use of both E-Learning and B-Learning in VT and implementing new paths to a new reality, collaborative, cooperative, inclusive has opened opportunities after the Covid-19 pandemic.

The distance learning modality is a type of teaching that gives students access to obtain a learning without having to physically go to a classroom, therefore, they can access online content through a virtual teaching and learning platform (Rodríguez *et al.*, 2021).

The student must have some motivation and discipline when putting it into practice to do the assigned tasks in a correct way. Because through online platforms new activities and resources are allocated so that the student can improve his/her knowledge and deliver online assignments in coordination with the tutor (Rodríguez *et al.*, 2021).

The distance vocational training modality is an increasingly popular option, as it improves and pro-

motes employability. This offers flexible and accessible alternatives for those who seek to improve their skills and knowledge, being able to balance their jobs and family commitments (Oliva Feria *et al.,* 2020).

This training model allows students to acquire specific knowledge, in a specific development area with a wide variety of branches. Today such distance learning includes nationally and internationally recognized certifications, which can significantly improve the employability of students. Also, for those looking to advance their studies, changing careers or upgrading in a specific area is often beneficial.

It can be affirmed that the technological resources used in distance learning, as well as content planning, must be adapted to this new teaching modality through interactive digital tools. Hence, it will be necessary to deepen the functioning of virtual teaching platforms in addition to knowing their structure, with the aim of designing more practical contents and activities that promote a participation of students being protagonists of their own learning (Manrique-Losada *et al.,* 2020).

4. Employability and Vocational Training in Spain, Portugal and Dominican Republic

The management of employability in various countries is a very important issue, since it depends on the capacity of workers to access the labor market. Some important points of employability in Spain, Portugal and the Dominican Republic determine that issues of employability in Spain according to the National Institute of Statistics (INE), indicates that in 2023 there was an unemployment rate of 13% at the beginning of January. Faced with this, employability varies according to the area and the different sectors, depending on the region in which it is developed. In terms of Vocational Training and employability, the technology and health sectors are constantly increasing.

Continuous education and training is increasingly needed, Vocational Training in different specialized areas has had a positive impact on the labor market, especially in some sectors as well as tourism and hospitality. Faced with this, the number of young people choosing to acquire a degree of Vocational Training is increasing in Spain, since it facilitates access to the labor market and in this way, they can

generate income continuously and continue preparing in their area of development (Femínía, 2019).

According to the National Institute of Statistics (INE) Portugal obtained an unemployment rate of 6.7% in December 2022, considering that employability varies, depending on the sector in which it is developing, in this case it is higher in some regions such as, Lisbon, the capital, in technology and service sectors.

Portugal has experienced an increase in foreign investment in tourism in recent years, for this reason it has created opportunities to generate jobs in this sector, together with other sectors such as technology; for this reason, the constant training for employability grows continuously.

In the Dominican Republic, according to data from the Central Bank, there was an unemployment rate of 8.7% in the third half of 2022. Currently there is an increasing rate in the tourism, manufacturing and construction sectors, mainly focused on the area of the capital, Santo Domingo. Technical and specialized training for the Dominican economy has experienced a steady growth in the last years and just as Portugal, it has had a significant increase in the tourism sectors (Ministerio de Industria, Comercio y PYMES, 2023).

For this reason, people use technical vocational training to be continuously trained and thus be able to update their curricula on topics in the specific area in which they develop. For this reason, Dominican Republic has made many agreements with companies to promote the employability of students who develop technical vocational training.

It is said that Spain was one of the most affected countries by the economic and financial crisis of recent years, also considering the current war between Russia and Ukraine, so that in recent years it has experienced a high unemployment rate. Although the unemployment rate is constantly recovering, it is high unlike some countries in Europe.

In another sense, in terms of employability Portugal has experienced a steady economic recovery in recent years. The unemployment rate has decreased significantly, and the economy is more competitive, although still in terms of employability it remains being a challenge in some areas, specifically in the different regions of the interior of the country.

As for the Dominican Republic, the unemployment rate remains very high. Although there has

been a decrease in recent years, the lack of employability has affected some jobs by the low salary in some sectors, although Tourism in the country is constantly increasing and there are employment opportunities in this sector, which is one of the main sources of income in the country.

We can indicate that employability in Spain, Portugal and the Dominican Republic is constantly affected by the different economic and financial situations that may arise, in addition to the various offers and demands in jobs on the part of the lack of skills of workers and the generation of public policies to promote job creation, both at the private and public levels to improve the management of employability in people (Hernández Carrera *et al.,* 2020).

In terms of employability after the Covid-19 pandemic, there has been a significant increase in technical vocational training in Spain, Portugal and the Dominican Republic, since various programs in different areas of specializations have had to be updated and digital skills have had to be promoted for changing various programs that are carried out. For this reason, the Vocational Training in these countries is constantly increasing and the students are more capable of being able to cope with the various jobs and with the diverse needs that arise in the labor market, especially in the area of skills and technological competencies.

4.1 Spain

The Spanish education system is ruled by the Ministry of Education and Vocational Training, taking into account the development of some laws, including the Organic Law of Education LOE approved in 2016 in which the structure and organization of educational levels was defined by which it has been modified through the Law of Improving Educational Quality LOMCE approved in 2013, with the aim of guaranteeing equal access to education for all (Brunet and Böcker, 2017).

Like other countries, Spain has experienced a significant increase in enrollment towards Vocational Training as it is an option increasingly valued by students to promote knowledge skills and be applied in the world of work, since many can access more quickly with specific knowledge to the labor market, increasing access to various jobs. In recent years, there has been many jobs in the areas of hospitality, business management, consultancy and education. Spain currently has a wide range of vocational training courses, with a total of 585 professional qualifications, 174 training courses (28 basic, 59 middle and 89 higher) and 21 specialization courses. In this context and as a basis and reference for this training offer, the National Catalog of Professional Qualifications has 756 qualifications from 26 different professional families (Ministerio de Educación y Formación Profesional, 2022).

4.2 Portugal

The education system in Portugal provides the development of technical and professional competencies in the field of education and is divided into the basic and secondary levels, complementing the secondary level in the technical and professional part. There is a public institute in Portugal called the Employment and Vocational Training Institute (IEFP), whose 'mission is to promote job creation and quality and to fight unemployment through the implementation of active employment policies, including Vocational Training' (IEFP, 2023).

In addition, there are other agencies, such as the Ministry of Education and Science, the Ministry of Economy and the Ministry of Labor, Solidarity and Social Security, and such training is promoted in a collaborative way to cover all people.

Currently, the management of Vocational Training in Portugal is being promoted and constantly renewed to improve the employability and competitiveness of the economy. Therefore, they have made the training offer more flexible, strengthened and expanded to be able to internationalize the management of training and strengthen digital competences towards a stage of renewal and expansion, betting on improving the employability of the country. In recent years, the demand for jobs in construction, hospitality and commercial management has been steadily increasing. Portugal currently has a wide range of vocational training courses, with a total of 392 professional qualifications, 3955 competency units and 8662 short-term units according to the National Catalog of Professional Qualifications (ANQEP, 2023).

4.3 Dominican Republic

The education system of the Dominican Republic is ruled by the Education Act 66-97, which carries out the education of the country, while technical vocational education is provided through the Institute of Technical Vocational Training (INFOTEP), which works hand in hand with the Ministry of Labor to promote the employability of Dominicans. This program aims to develop the skills and techniques to generate employability of Dominicans by developing their training level to respond to the various socio-economic needs in the field of employability and training of the country (Arbizu Echávarri, 2019).

In addition, technical and vocational training is also carried out in secondary education between the last two courses and in several specific technical areas, where students complete their technical careers.

The INFOTEP currently includes various training programs, among which are computer science, hospitality, design, administration, construction, tourism, health, electronics, electricity, industrial clothing manufacture, bar and restaurant, beauty, among others. These programs are taught through technical training in training centers and also remotely through its virtual platform.

At present, young people are becoming very interested in technical vocational training, as several programs have been launched to promote their digital skills. Although there are still challenges to overcome and transform Vocational Training in the Dominican Republic, work is constantly being done to improve Vocational Training and to cover the current needs of the labor market.

The Dominican Government, along with INFOTEP, seeks to promote technical vocational training through constant training towards education and employability, and has therefore created new training centers, modernized their learning spaces and established new partnerships with companies to encourage the participation of technical vocational training, in addition to carrying out innovation and entrepreneurship programs.

In the last year, the market demands for the Dominican population in trade, services, free zones and construction have increased significantly.

In terms of employability in the professional area, both Spain and Portugal and the Dominican Republic have a constant concern for promoting quality vocational training to meet the demands of the labor market and facilitate the integration of students. Therefore, these countries are constantly working to implement correct management in the area of VT, developing digital competencies and skills to adapt their training system to the labor market, guaranteeing experiential and practical training. In these countries, the labor market is growing in the areas of hotels, business management, consultancies, education, construction, business management, services and free zones.

INFOTEP's training activities in 2021 were grouped into 69 professional families, ranging from physical training to strengthening and developing the productive, industrial, tourist, hotel, health, agricultural market and teacher training and training, including those related to services. The INFOTEP, with an expanded infrastructure, has five technological centers, the School of Hotels, Gastronomy and Pastry, in Higüey, 56 mobile workshops; 277 System Operating Centers (COS); the centers of Teaching Development and Innovation and of Assistance, Training and Business Competitiveness and the Virtual Training Center (Instituto Nacional de Formación Técnico Profesional, 2021). In addition to Infotep, the Directorate of Technical and Vocational Education, which is part of the General Directorate of Education, currently carries out technical and vocational training in secondary education in academic and arts, according to the formal education structure of the Dominican Educational System (Ministerio de Educación, 2022).

The DGETP (Directorate of Technical Vocational Education) is a unit of the Ministry of Education that is responsible for technical vocational education in the second cycle of the technical modality in the educational centers of the country, in charge of developing policies and designing curricula for this education level, which is related to the sectoral scope, internships and education program "emprenderá" (DGETP, 2020).

5. Skills for employability in the 21st Century

Considering that the great challenge is to increase the competencies of the VT, it is believed that digital inclusion, the exchange of ideas, learning resources, the democratization of training, social inclusion and intercultural communication are at the basis of a paradigm shift in relation to the use of digital technologies, namely the use of E-Learning and B-Learning as a way to promote competencies, especially multicultural competence and intercultural communication, helping and promoting employability.

Therefore, it is essential to identify scenarios and strategies for a didactic model in Distance Vocational Training that contributes to a new culture, a consolidated trend and an irreversible process. Digital technologies and communities of practice (wiki, blogs, videos, forums, chats, open resources, simulations, gamification, multimedia animations, image, video, audio, among others) should therefore be at the service of the teaching-learning process, in which learners are the center and professors become knowledge facilitators, interacting towards collaborative and cooperative knowledge, enabling the development of competencies and facilitating employability.

Adapting the words of Pereira *et al.* (2006) to this specific context, it is necessary to build a pedagogical model based on premises such as inclusion, flexibility, integration and respect for the individuality of learners, since, as Moraes (2001) states, "there are instruments of collective intelligence in the network, capable of gradually and procedurally promoting an ethics through interactions, based on principles of dialogue, cooperation, negotiation and participation" (Moraes, 2001, p. 6). In addition, we have as a basis the competencies defended and presented by the Consejo Nacional de Investigación (2012), Foro Económico Mundial (2015, 2016, 2017, 2018, 2021), and the Companion Volume (Consejo de Europa, 2017; Figueiredo, 2019). As a transversal axis of the studies mentioned above, digital competence appears, which, for example, in the context of Vocational Training, is fundamental in relation to the mastery of other key competencies, such as the safe and critical use of digital information and communication technologies and problem solving.

In this context, and in view of the need to train professors to be prepared for acquiring and applying of these essential competences, it is observed that in the Dominican Republic and, above all, in Spain and Portugal, an expansion of the degree is taking place linked to the strategic objectives of the country and the European Community, through the strengthening and expansion of distance education, with the aim of developing competencies, creating itineraries for young and innovative adults, creating conditions for the improvement of distance education, supporting a massive distance education system (access and quality), responding to the challenge of training young and adults as local citizens and professionals (exchange, communication) and investing in intercultural education within Vocational Training (Martín-Párraga et al., 2022).

Thus, individual work and collaborative work, or in pairs or small groups must be considered, which obviously involves social learning respecting the individuality of each student. Because not everyone learns in the same way, each individual adopts a learning perspective they feel more comfortable with, and exclude others they are less comfortable with (Pritchard, 2009; Valente, 2022).

Therefore, according to Valente (2022) the teaching aspects to consider in distance learning for the acquisition of skills and to help young people and adults in the insertion of the labor market are pointed out:

- Provide an immersive virtual environment of frequent dialogue through mediation.
- Create collaborative activities between peers and collective productions.
- Use teaching strategies that allow respecting the various learning styles.
- Enable proposed activities to be based on customized curriculum strategies and scenarios.
- Enhance activities based on virtual space usage styles.
- Design the contents based on heutagogy, so that they are learned in a collaborative way, and allow the students to be author, producer and creator of their spaces.
- Use teaching strategies that allow reflection, criticism and analysis and not mere reproduction or repetition (audio, video, image, narra-

tion, multimedia animations, forums, simulations).

- Use diversified learning resources (texts, videos, interviews, simulators, scientific articles) with the convergence of numerous technologies.
- Track student performance, providing feedback that enables self-regulation of learning over time.
- Encourage gamification in distance modality.
- Allow portfolios to be created in distance learning.
- Invite international speakers on topics related to the goals and objectives and contents taught in Vocational Training.
- Use Metaverses to Teach English in Distance Vocational Training.
- Organize virtual communities of practice.
- Evaluate in a structured and periodic way to monitor the mastery level towards learning objectives and their respective contents.
- Evaluate using Learning Analytics.

This study states that this learning should conceive a supervised interaction, through which it is intended to stimulate reciprocity among learners, enhancing the exchange of information and experiences, as well as cooperation, collaboration and interaction in the construction of knowledge, which are also added values in the teaching and learning process. It is also important to highlight the intention of creating a virtual space for guided training under the careful look of the trainer and the pedagogical supervisor, in which there is interaction, distribution of information and doubts, in which the student can develop follow-up activities, ask questions, exchange information and experiences resulting from networked knowledge (Valente, 2022).

6. Current outlook trends

The current global situation, as a result of the Covid-19 pandemic and the war in Ukraine, has forced companies to adjust their internal operating dynamics to maximize their returns effectively, taking into account the relationship with competition. In the current scenario, companies increasingly feel the need to invest in and implement management models focused on developing their human capital, as they have realized that success and competitiveness depend, above all, on how quickly they can adapt and respond to market challenges. To this end, it is urgent to be more dynamic, so that the use of digital technologies becomes an indispensable requirement to ensure the reorganization of business thinking and, consequently, leads to the recognition of human capital as the main differentiator. It is a question of survival for companies of the 21st century inserted in a knowledge society in which knowledge and learning are the key words in human capital (who wants to be entrepreneurial) and not only in financial capital, in which distance Vocational Training has a great impact.

In addition, the formation contexts of the 21st century, characterized by heterogeneous audiences, involving face-to-face, virtual, and mixed activities, require enormous pedagogical and organizational challenges (Figueiredo, 2019; Moreno Marquez, 2021).

Thus, it can be said that first distance vocational training aims to develop professional competencies in young people and adults, to develop skills, behaviors and attitudes that allow them to be more effective, efficient, and satisfied in the professional field, and to acquire knowledge necessary for their personal and professional development.

In this sense, E-Learning and B-Learning in distance Vocational Training should promote continuous learning in a logic of sharing, transmitting and accumulating knowledge and skills, essential to the performance of the professional activity. It is believed that if there is a scenario in which quality VT and E-Learning or B-Learning can be combined, with programmatic content oriented towards sustained didactic scenarios and strategies, in which the primacy of digital inclusion and flexibility are present, it will be possible, to promote and increase school and professional qualifications, make young people and adults more autonomous in the search for knowledge and promote vocational rehabilitation, promoting (re)insertion and/or (re)integration. Therefore, it is necessary to be aware that the teaching and learning process in distance vocational training for employability should not only be focused on training, but, above all, on the interaction established between members of the learning community (Nieto Ortiz *et al.*, 2022).

7. Conclusions

In the current knowledge society in which we operate, we are all (re)learning to teach and learn, including the human and the technological aspects. Assuming that VT is one of the main agents that help individuals adapt to technological, social and cultural changes, it seems fair to admit that its role is extremely relevant for employability.

The main objective of this research is to delve into the characteristics of distance vocational training with a focus on employability in Spain, Portugal, and the Dominican Republic, providing an overview of such training in the different countries. It is found that distance learning in these countries is significantly increasing among the most popular VT options.

The impact of this research has triggered important contributions such as that the objective of distance vocational training in these countries aims to increase employability and improve the various digital skills and competencies of workers and that they can integrate into a more updated labor market, while offering various distance programs that previously did not have a digital path, only face-to-face due to lack of resources, technologies or knowledge by students and training centers.

Vocational training in Spain, Portugal and the Dominican Republic will continue to grow, as the focus of these countries is to offer adaptability in their curricula and manage flexibility for access to them, so students can be continuously trained and access the labor market through up-to-date, solid and digital training.

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Challenges for teacher training in the key of inclusion

Retos y desafíos para la formación docente en clave de inclusión

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Abstract

This work is part of a research about teacher training needed to meet the diversity of students from an inclusive perspective. Teacher training programs must innovate in order to improve for the benefit of all, in addition to contemplating the inclusive approach so that it will lead to an improvement in the quality of teaching in the classroom. The main objective is to know the level of training of teachers in extended school day centers in vulnerable areas of Santo Domingo, in order to make proposals to guide training towards the creation of an innovative and inclusive culture. The data were collected through a questionnaire of closed questions, an in-depth interview and an observation script, applied to 29 participants; the questionnaire is the central instrument, and the interview and observation script are the complementary ones. The data were analyzed following a mixed methodology, combining a quantitative and qualitative approach. The research had a descriptive approach based on random probability sampling. The main findings indicate that most teachers value innovation to improve the quality of the educational process in favor of inclusion; however, they have difficulty in their training, knowledge, skills and abilities to integrate it in the classroom. The discussion and conclusions allow us to make suggestions to guide teacher training in the key of inclusion based on a culture of innovation and educational improvement.

Keywords: education, inclusion, training, teacher, innovation, improvement.

Resumen

Este trabajo forma parte de una investigación sobre la formación del profesorado necesaria para responder a la diversidad de estudiantes desde una perspectiva inclusiva. Los programas de formación docente tienen que innovar para mejorar en beneficio de todos, además de contemplar el enfoque inclusivo para que revierta en la mejora de la calidad de la enseñanza en el aula. El objetivo principal es conocer el nivel de formación del profesorado de centros de jornada escolar extendida en zonas vulnerables de Santo Domingo, para realizar propuestas que orienten la formación hacia la creación de una cultura innovadora e inclusiva. Los datos fueron recolectados mediante un cuestionario de preguntas cerradas, entrevista a profundidad y guion de observación, aplicados a 29 participantes; el cuestionario es el instrumento central, y los complementarios son la entrevista y guion de observación. Los datos se analizaron siguiendo una metodología mixta, combinando el enfoque cuantitativo y cualitativo. La investigación tuvo un enfoque descriptivo a partir de un muestreo probabilístico aleatorio. Los principales hallazgos señalan que la mayoría del profesorado valora la innovación para mejorar la calidad del proceso educativo en favor de la inclusión, sin embargo, presentan dificultad en su formación, conocimientos, destrezas y habilidades para integrarla en el aula. La discusión y conclusiones permiten realizar sugerencias para orientar la formación docente en clave de inclusión a partir de una cultura de innovación y mejora educativa.

Palabras clave: educación, inclusión, formación, docente, innovación, mejora.

1. Introduction

This work is part of the R+D+i Project, PID2019-108230RB-I00, funded by MCIN/AEI/10.13039/501100011033. Education in the context of the 2030 Agenda and the Sustainable Development Goals (SDGs) is in the process of adaptation that involves thinking about effective mechanisms to develop skills in citizens and respond to the challenges posed by the advancement of science and technology with quality and equity. The development of these skills depends on innovation in education towards a learning model that links human resources with global demands and "promote creative-productive thinking, decision-making, problem solving, learning skills, collaboration and self-management" (Cahyani, 2019, p. 384). Innovation is the eit her generation or creation and production of useful knowledge to transform society in favor of an active and participatory learning culture that also stimulates reflective and critical thinking and meaningful learning (PNI2030, 2022, p. 15). Other authors (Rodríguez, 2022) refer to inclusive scientific and technological practices that require changes in teacher training, including the academic career and that pose a challenge for teacher training and a significant challenge to invest in innovative training programs (Owen and Pansera, 2019). Martínez (2021), refers to the personal and shared reflexive learning and the problematization it can generate in the professional practice of the teacher and in decision making. In this sense, Pascual and Navío (2018) define innovation in education as "any change generated inside or outside an institution, oriented towards improvement, (...)" (p. 76). It is therefore an educational procedure different from established practices whose purpose is to improve educational efficiency through "pedagogical innovation, scientific and methodological and technological innovation" (Troncoso et al., 2022, p. 4).

In this sense, innovation accelerates the development of skills and promotes the change in teachers and students in the way of thinking. One of its characteristics is "the opportunity to learn from others and with others based on the methodological foundations of collaborative learning" (Del Río, 2021, p. 175), although some institutions do not consider innovation as a "strategic asset" (Pérez, 2022, p. 4) because they could stayas is, up to you

as improvement in the quality of the functioning of educational institutions. This author recommends that institutions incorporate innovation processes in strategic plans to generate internal and permanent spaces for training and accompaniment to innovation. Innovation is the key to transform educational systems, the promotion of autonomy, useful learning, critical and creative thinking; in this sense, Trimmer et al. (2020) state that "for innovation to make sense it will require a professional exercise that has openness, updating and a proposal for continuous improvement. (...)" (p. 9). On the other hand, Cabero and Martínez (2019), address teacher training in technological and instrumental competencies as a basis for initial and continuous teacher training, in the framework of inclusive education.

In this sense, the Dominican Republic advocates for this proposal of continuous improvement and recently issued Decree 278-22, which approves the National Innovation Policy (PNI2030), based on four pillars, where No. 2 refers to human capital, and states "the strengthening of the competencies of human talent facilitates the insertion in the knowledge society (...)" (PNI2030, 2022, p. 16). To promote these skills in citizens it is necessary to strengthen digital competencies, promote a change of mentality and the creation of a culture of innovation from school, because although it is true that the traditional model prevails on the teaching activity in schools, it is no less true that the training is not aimed at developing innovative competencies, and "as result the reproductive acts in professional training at the risk of offering people more reproduction than innovation" (García et al., 2022, p.1). Other authors understand that innovation in technology for educational improvement involves rethinking the way of thinking, evaluating and analyzing the methods and mechanisms used to generate change, such as Gómez et al. (2020), stating that "the arrival of information and communication technologies (ICT) in the educational system has led to numerous new and interesting resources in the classroom" (p. 36). However, the teacher is not able to take advantage of it, being this the problem addressed by this research: "the teacher training necessary to carry out inclusive, innovative and creative educational processes". Although the approach is complex due to its nature and didactic, pedagogical, methodological, and technological implications, it is necessary to overcome

the competency gap perceived in the teacher and that negatively influences the integral development of the student.

1.1. Educational Innovation as the Axis of Teacher Training: Dominican Republic Case

The development of educational innovation and teacher training in the Dominican Republic is based on the Constitution of the Republic, General Education Law 66-97, National Innovation Policy, PNI2030, and the Comprehensive Teacher Training, Quality and Equity Policy of the Ministry of Higher Education, Science and Technology (MESCYT), the latter being the regulatory body for teacher training and guarantor of the quality of Dominican higher education. It is understood that "a determining factor of the teaching-learning process is the teacher, given the complexity of the challenges involved in preschool, continuous and professional development, there must be a comprehensive view for teachers of initial, primary and secondary" (MESCYT, 2021, pp. 8-10). The Rules for Regulating the Development of Teacher Training Programs in the Dominican Republic (Regulation 09-15) have been subjected to profound debates and modifications aimed at adapting the teacher training system to current requirements; this reform serves as a basis for educational institutions to reconsider the need to prioritize and assume the pedagogical approaches that best respond to the development of competencies and skills.

The problem lies in the fact that Is there evidence multiple barriers in teaching practices and as Arancibia *et al.* (2020) state, "not sure if its manifest or manifests themselves in beliefs, resistances and negative attitudes towards pedagogical innovations, there is a persistence in obsolete teaching and evaluation methodologies, a lack of perception of the importance of innovating" (p. 90). This situation may have originated because sometimes teacher training is approached superficially and lacks a previous study of teaching needs on which to base initial and continuous teacher training, being considered as a secondary element in the processes of teacher improvement (Aguavil *et al.*, 2019). Teaching practices have a direct impact on the development of skills and abilities of students, as well as on the acquisition of knowledge through own experiences (Sarmiento

et al. (2021). Likewise, López *et al.* (2022), not sure if it should be argues (third person) that "several studies agree on the need for teachers to innovate their teaching methods, combining resources and employing spaces that motivate students (...)" (p. 46), since traditionally educational innovation has been more focused on learning processes and not on teacher training to learn to teach (Palacios *et al.*, 2021). Acosta (2018) says that "while many creative and innovative processes are implemented in the classroom, not all have continuity over time, since they often depend on the effort of a particular teacher" (p. 4). In this sense, Savina (2019) also raises the existence of a moderating influence of the professional factor in the innovative activities of teachers.

Therefore, the need to promote methodological innovation in Dominican teachers remains a topic of reflection. This is the framework of this research, to promote the reflective construction to overcome the obstacles that prevent its progress in the educational process. The research will highlight some evidence of the teacher's voice, which contribute to innovation from initial and continuous teacher training to transform advanced traditional practices into a new inclusive and innovative educational system.

1.2 Approach to the problem

The centers of initial, primary and secondary extended school day (ESD) of vulnerable areas in Santo Domingo characterize by absence of environments that favor innovation and creativity, limited knowledge of teachers on how to innovate, poor development of digital competencies, inaccessibility to the resources that enable innovation, professional and training gap of teachers to support innovation as a mechanism to promote critical and creative thinking, weakness in the use and mastery of innovative strategies and the inadequacy of educational centers for creating a culture of innovation. The current situation and the background exposed allow to approach the research from the following questions: 1) What is the training level of teachers working in the ESD of vulnerable areas in Santo Domingo and how to approach their training to be inclusive and innovative? 2) How should teachers be trained to address innovation as a culture in the classroom of the initial, primary and secondary levels? 3) Are there evidence of the use and integration of current

technologies and the improvements they produce in learning outcomes in students?

1.3 Objectives

The above questions constitute the problem of this research, whose general objective is "to know the training level of teachers in educational innovation of the initial, primary and secondary level working in ESD centers of vulnerable zones in Santo Domingo, to propose suggestions that orient the training towards the creation of an innovation culture in the teaching and learning process". The other objectives in which the general objective is specified are: 1) To determine the training level in educational innovation possessed by teachers working in the ESD initial, primary and secondary educational centers of vulnerable areas of Santo Domingo. 2) To propose suggestions to guide teacher training towards the creation of a culture of innovation in teaching and learning. The variables or categories: educational innovation and teacher training have allowed to hypothesize: the higher the level of teacher training, and the higher the level of progress in educational innovation.

2. Methods

Basic elements are addressed for conducting the research to define the logical relationship followed in the problem approach, methodology, design, sampling, data collection and procedures for analysis and interpretation of data (results). The methodology is descriptive (Carballo and Guelmes, 2016), correlational, non-experimental, cross-sectional approach with a mixed approach (Carhuancho *et al.*, 2019; Ramírez and Lugo, 2020) that combines quantitative research, as it uses a structured research instrument; a closed-question questionnaire; and qualitative research, as uses in-depth interviews and the observation script. The techniques used for analyzing the data in the case of the questionnaire were descriptive statistics through absolute and relative frequency. The data are presented by frequency tables; as for the interview a transcription of the data was performed, and the observation script was done through a checklist. Regarding the analysis and interpretation of the data, the information was grouped by centers, dimensions and subdimensions, was interpreted and conclusions were obtained.

2.1 Participant Sample

The sample belongs to the province of Gran Santo Domingo, municipality of West Santo Domingo. For collecting the data, a probabilistic sample was used through a simple random selection, with a total of 29 teachers from three public and ESD educational centers (hereafter 1, 2, 3), attending the initial, primary and secondary levels. The questionnaire included the total of the selected sample presented in Table 1; the interview reduced the sample to ten participants characterized in Table 2 and the observation script was reduced to six participants presented in Table 3.

Table 1. *Sample constituted by the teachers consulted in the questionnaire*

Case	Teacher code	Type of center	Specialization of the teacher
1	001,002,003, 004, 005, 006, 007, 008, 009, 010, 011	Initial and Primary Education	Education - Humanities
			Initial Education
			Elementary Education
			Education - Maths
			Physical Education
			Education - Natural Sciences
			Education - Social Sciences
			Religion

Case	Teacher code	Type of center	Specialization of the teacher
2	012, 013, 014, 015, 016, 017, 018, 019, 020		Education - Humanities
			Education - Maths
			Initial Education
			Education - Social Science
			Basic Education
			Education - Maths
			Education - Humanities
3	0,21, 022, 023, 024, 025, 026, 027, 028, 029	Secondary Education	Education - Social Sciences
			Physical Education
			Dentistry

Samples of participants in the interview

Table 2. *Codes and criteria for selecting participants in the interview*

Code	Years of experience	Working area	Degree	Role
003	12	Coordination	Degree in Humanities	Teacher coordinator
005	18	All the areas	Degree in Initial Education	Teacher
007	1.5	All the areas	Degree in Basic Education	Teacher
012	16	Coordination	Degree in Education in Maths	Teacher coordinator
015	10	All the areas	Degree in Initial Education	Teacher
019	10	All the areas	Specialization in Maths	Teacher
021	05	Natural Sciences	Dentistry	Teacher coordinator
027	05	Physical education	Degree in Physical Education	Teacher
029	05	Social Sciences	Degree in Social Sciences	Teacher

Sample of participants in the observation

Table 3. *Codes and criteria for selecting participants for the observation*

Code	Years of experience	Working area	Degree	Role
008	28	Coordination	Degree in Humanities	Teacher
010	21	All the areas	Degree in Initial Education	Teacher
014	05	All the areas	Degree in Initial Education	Teacher
017	04	All the areas	Degree in Basic Education	Teacher
023	05	Spanish	Master	Teacher
025	18	Math	Master	Teacher

2.2 Instruments

Three instruments were used to know the training level in educational innovation of teachers in ESD centers in vulnerable areas of Santo Domingo: questionnaire, in-depth interview, and observation script. 63 items were used in the questionnaire, 17 for the interview, and 17 in the observation script. These were validated by judgment of 18 experts, with characteristics similar to the sample selected, their contributions were included in the final version. The instruments are organized into three dimensions: Intellectual Stimulation (ESIN), Knowledge and Skills Development (DCH) and the Legal, Philosophical and Social Perspective (PJFS), broken down into thirteen sub-dimensions presented in Table 4. The ques-

tionnaire was self-administered, and the interview and the observation script were personal.

A Likert scale of 5 points was used for measuring the questionnaire, where value 1 indicates "never" and 5 "always". The analysis and interpretation of data from the questionnaire was performed using EXCEL, by centers, dimension, subdimension and items. Results are presented using frequency tables and graphs (inferential statistical analysis). The interview used the transcription technique of participants' responses and the observation guide checklist with the registration of relevant aspects for the research. The three instruments contain two sections: general data, and dimensions and subdimensions.

Table 4. *Categories, dimensions, and subdimensions*

Categories	Dimensions	Sub-dimensions
Teacher training	Intellectual stimulation	The competencies to perform inclusive educational processes
		Teacher training to manage individual differences
		The creativity for developing good practices
		Innovation in the teaching-learning process
		Teacher leadership in the school
		The teacher´s professional ethics and its application in the teaching practice
		The teacher´s motivation to deal with the community
		The teacher´s empathy with the group
		The teacher´s inspiration in the teaching practice
		The teacher´s empathy with the group
		The knowledge of human rights focus on inclusion
Inclusive education	Law, Philosophical and Social Perspective	Knowledge of the teacher on inclusive law
		Equal treatment for all students
		Good environment at work

2.3 Procedure for analysis

The two categories were maintained in the organization of the data for its analysis: teacher training and inclusive education that were disaggregated

in the dimension of intellectual stimulation and four subdimensions. The analysis was carried out at three levels: the level of educational centers, the dimensions and the subdimensions, specified in table 5. The results are presented according to the third level.

Table 5. *Categories and organization levels for data analysis by schools, dimensions and subdimensions, with their corresponding codes*

Categories	Educational center	Dimensions	Sub-dimensions	Code/ Subdimension
Teacher Training (FD)		Educational Innovation	The competencies to perform inclusive educational processes	CDPEI
Intellectual Stimulation (ESIN)	Case 1		The teacher training to handle individual differences	FDDI
	Case 2		The creativity for developing good practices	CDBP
	Case 3		The innovation in the teacher-learning process	IPEA

3. Results

The analysis and interpretation of data began with the collection, recording and organization of information from fieldwork. In this case, only the results are presented according to the Intellectual Stimulation dimension (ESIN) and its subdimensions: the competencies to develop inclusive educational processes (CDPEI), teacher training in the management of individual differences (FDDI), creativity in the development of good practices (CDBP) and innovation in the teaching/learning process (IPEA) in schools (case 1, 2, 3).

Figure 1 shows that 76% of the teachers surveyed in the ESD centers of the initial, primary and secondary level, (case 1, 2, 3) answered that they "always" develop competencies in their students, while the other 24% answered "almost always"; however, in the interview and observation, most did not evidence the use of strategies for the development of competencies; they express: "we do not have strategies to respond to the students (...) (003 ,014), the MINERD must train us to meet the objectives of education (005, 017, 021), we must invest more in our training (008, 015)'. The answers reflect the need to develop the competencies that allow the application of the current curriculum, where innovation is a transversal axis.

Figure 1. *Item 1.3 Are the following competencies developed in your classroom: ethics, citizen, communicative, logical, creative, and critical thinking, problem solving, scientific and technological, environmental and health, personal and spiritual development, on an equal footing for all students?*
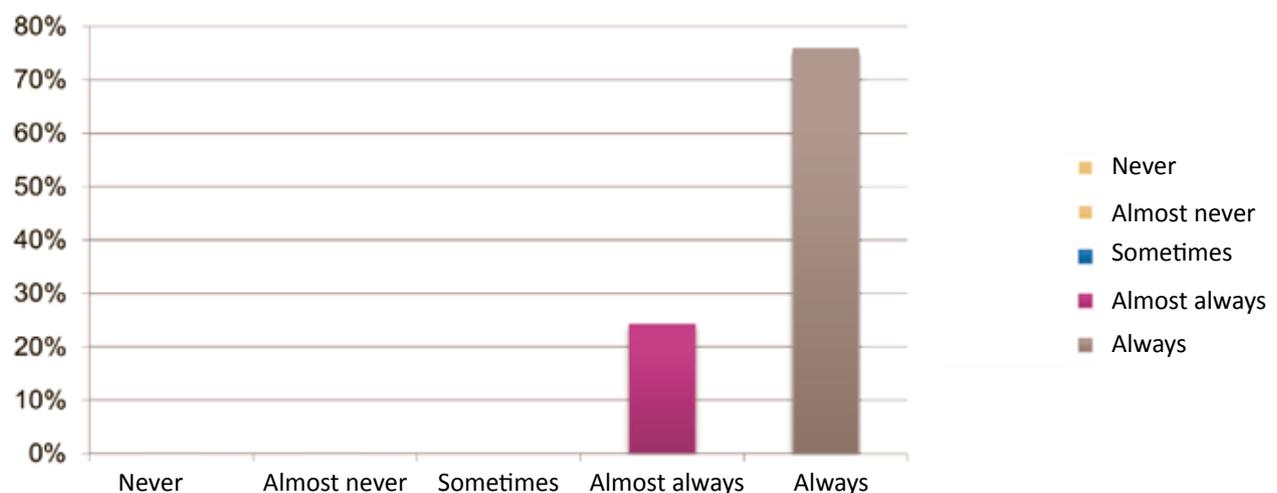
Note. Data obtained from the instrument applied to the sample.

It is worrying that 76% of teachers surveyed responded "always" use strategies that promote the development of innovation and autonomy, mobilizing in an integrated way concepts, procedure, attitudes and values, 17% "almost always" and 7% "sometimes"; however, when triangulating the results, a high percentage is working with a methodology that places them in a traditional teaching model, stating: "to develop creative and innovative class you need training in methodology (08, 015, 029), (...) neither the university nor MINERD train us in managing strategy for developing competencies (003, 017 025)". Figure 2 presents teacher reactions that show the didactic-pedagogical level and technological knowledge to develop educational processes with active and innovative strategies.

Figure 2. *Item 1.4 Do you use strategies that promote in your students the development of innovation and autonomy in diverse contexts, mobilizing concepts, procedure, attitudes and values in an integrated way?*
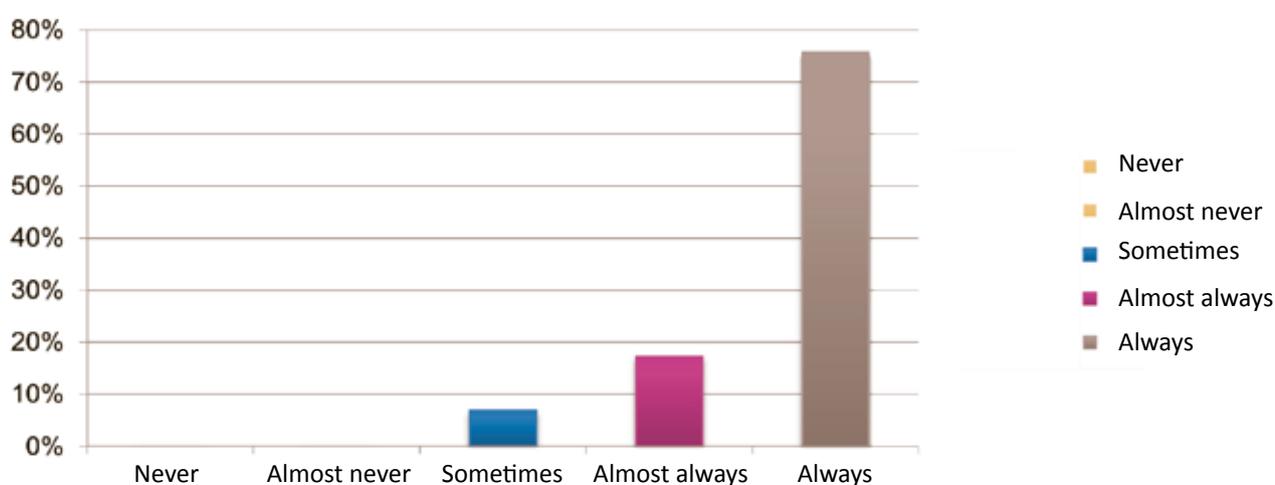
Note. Data obtained from the instrument applied to the sample.

The results of Figure 3 show that 7% of the surveyed teacher responded "almost never" the training received serves to respond to the educational needs of the student, 10% "never", 21% "sometimes", 41% "almost always", 21% "always"; it shows that the majority is prepared to develop quality educational processes; however, when triangulating the results, a high percentage of the teachers presents weakness in their training to respond to creative and innovative processes, they state: "The MINERD must empower us to attend the diversity of the classroom in an innovative and creative way (02, 05), the knowledge we were taught at the university is not enough, we need training to develop good teaching practices (010, 015, 019)". The teacher's voice evidences the need for training to overcome the pedagogical, didactic, methodological, and technological gap in teacher training.

Figure 3. *Item 2.7 Does the training you received serve to meet the differentiated needs of your students, despite the responsibility and workload involved?*
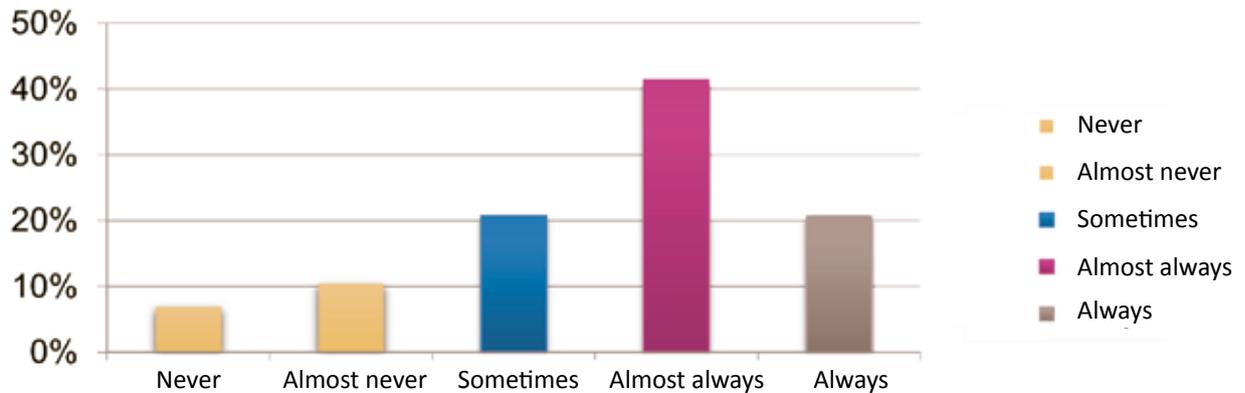
Note. Data obtained from the instrument applied to the sample.

Regarding training in the use of innovative strategies to positively assess diversity; according to figure 4, 45% answered "almost always" is enough, 21% "sometimes", 14% "always", 10% "never" and 10% "almost never"; however, the results of the interview and observation are worrying since a high percentage have difficulty in the use of active and innovative strategies and express: "we have weakness in the use of active strategies (007, 0014, 0021), training workshops do not deal with these strategies, since it is taught by people who do not have enough knowledge (008, 012, 021)". It shows the need for teacher training based on an innovative approach that enable educational actions to respond to the needs of students.

Figure. *Item 2.10 Do you have strategies that allow you to positively assess diversity in students attending the classroom?*
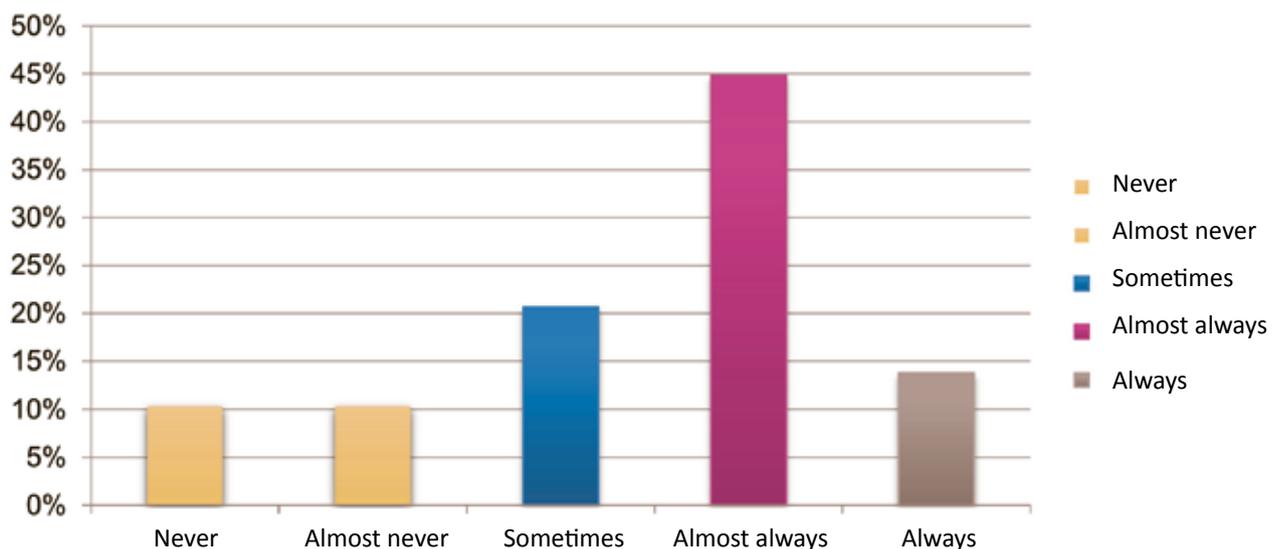
Note. Data obtained from the instrument applied to the sample.

The results presented in Figure 5, show that 28% of the teachers surveyed responded that "almost always" promote the participation of students in the process of new productions, 24% "almost never", 21% "always", 14% "never" and the other 14% "sometimes"; however, the results of the interview and observation show low participation of students in new production processes, stating: "the methodology that is easier and makes students participate is questions and answers (08, 012, 027), the participation depends a lot on the training we can have (…), lack of training in pedagogy (005, 017, 029)". The results confirm that teachers with a mastery of active methodologies and strategies are required.

Figure 5. *Item 3.1 Do you promote in the classroom student participation in the process of new productions and prepare environments that emphasize the responsiveness of all students in creative ways?*
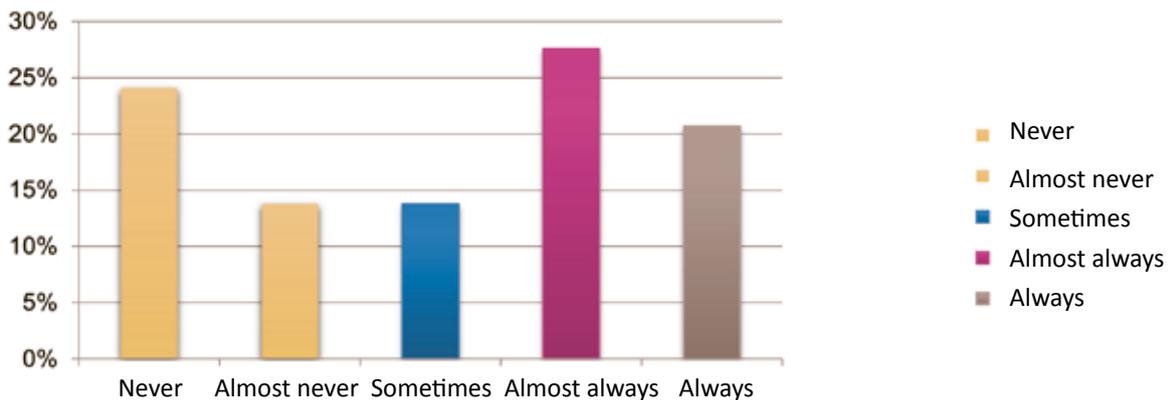
Note. Data obtained from the instrument applied to the sample.

Regarding the development of innovation in the educational process, the results presented in Figure 6 show that 41% answered "almost always", 28% "always", 21% "sometimes", 7% "never", 3% "almost never"; however, according to the interview and observation, the majority have difficulty in handling methods and strategies in a creative and innovative way, stating: "what limits the development of competencies in students is the lack of teacher training (012, 014), it is not easy to plan, there are many problems for didactic planning (005, 019, 029)". The responses highlight the need for an initial and continuous innovative training plan.

Figure 6. *Item 2.8 Do you have mastery of a variety of teaching and learning methods and strategies that you use in the classroom in order to improve students with different learning abilities in creative and innovative ways?*
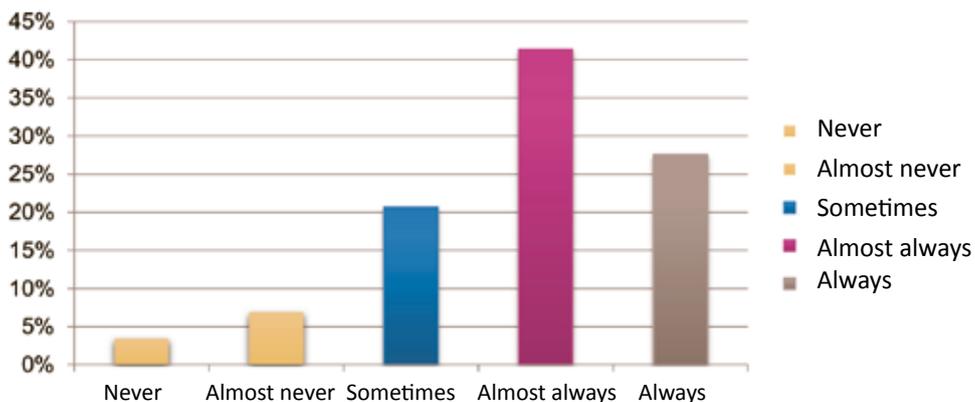
*Note.* Data obtained from the instrument applied to the sample.

The results presented in figure 7 are worrying since 55% of the teachers surveyed say that the educational center has environmental conditions, adequate physical and technological infrastructure, as well as accessibility to audiovisual and technological resources for developing innovation, 28% said "almost always", 10% "never", 3% "sometimes" and 4% "always". In the interview and observation 100% confirmed that the centers are not suitable for educational innovation, stating: "there are not conditions in these educational centers to develop innovation (010, 017, 029), we lack resources, we have no internet, (010, 014, 021), in such conditions it is not possible to talk about innovation or creativity (003, 014, 021)". The results show a lack of conditions in infrastructure and technology to promote educational innovation.

Figure 7. *Item 4.1 Does the educational center have an adequate infrastructure for the development of science, technology and innovation and accessible to all students, even if they are different?*
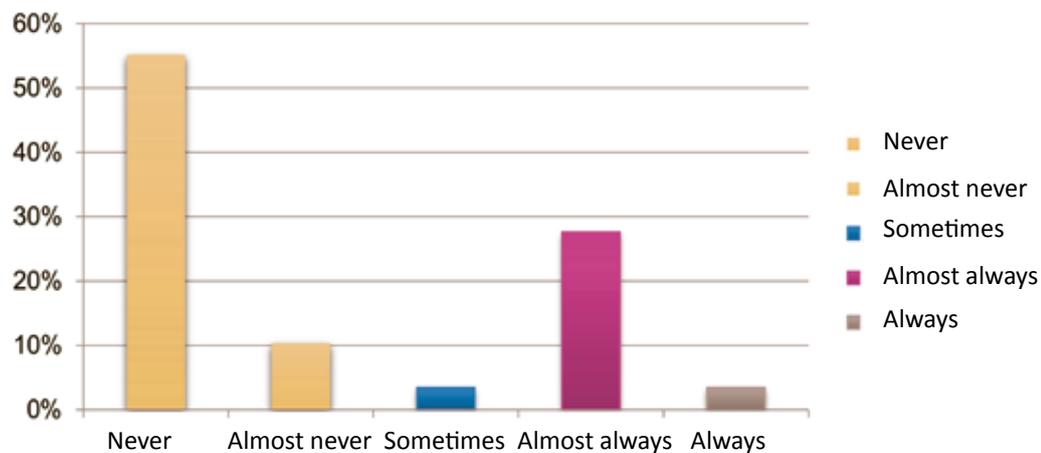
Note. Data obtained from the instrument applied to the sample.

4. Discussion

The literature show that there are some challenges regarding the innovation capacity of schools to respond to the social context with quality and equity. Several authors point out that we still need to advance on teacher training from an innovative, creative and inclusive perspective (Booth and Ainscow, 2011), according to current social demands. Ríos and Ruiz (2020), state that "there is consensus among the different specialists who say that innovating in education (...) poses the challenge of overcoming personal, institutional or sociocultural obstacles associated with the transformative change process implied by innovation" (p.103). Ainscow (2020b) refers to global changes to promote inclusion and equity in schools. It is necessary "the creation of pedagogical dimensions that indicate the training competencies which must be presented by a teacher in the face of the new technological trend" (Hernández *et al.*, 2018, p. 672). Only an excerpt of the results is presented, therefore the discussion is based on objective 1 and answering the questions formulated.

Objective 1. To determine the training level in educational innovation possessed by teachers working in the ESD educational centers of initial, primary and secondary education in vulnerable areas of Santo Domingo

Regarding the level of teacher training at the initial, primary and secondary levels of ESD centers, and how to approach their training to be inclusive, innovative and creative; it is confirmed and assessed that 100% has a bachelor ´s degree as a; however, it can be seen that most present a gap in training that hinders the progress of innovation and reaffirms the need to raise the training level from an innovative perspective. It is suggested to the MESCYT, the Ministry of Education (MINERD) and the Higher Education Institutions (IES): 1) promote the policy reform of integral teacher training, quality and equity; 2) enable the implementation of plans and training programs aimed at the development of cog-

nitive, didactic, pedagogical, technological and innovation competencies, which allows to produce the structural change of the national educational system and promote a training system based on innovation in the classroom. Rossi and Barajas (2018), refer that "teachers demand training more consistent with their teaching needs, (...)", (p. 317) in the framework of a more inclusive training (López *et al.*, 2022).

The results highlight that a high percentage of the teachers consulted (case 1, 2, 3), are working with a methodology that places them in a traditional teaching model and their reactions show the low level of knowledge and limitations to face educational processes with active and innovative strategies. The teachers insist that the MESCYT, MINERD and the IES promote a paradigm change in teacher training that indicate the ways new generations learn and reinforce the essential competencies for constructing an innovative, creative, dignified, fair and equitable society, as stated by the MESCYT (2015):

> Teacher training programs must be structured and designed considering the characteristics of today's society, the demand for education to respond to society's needs and the skills required for a teacher who will have the responsibility of educating children and young people in the 21st century (p. 5).

It is confirmed that most teachers in ESD, even though they have a minimum level of Bachelor's degree, have not received specific training in educational innovation, nor is there evidence in the classroom of the use of active, participatory and inclusive strategies (Ainscow, 2020a). Hence, it is required that MINERD, the MESCYT and the (IES), address a reform and adaptation process of the training system to respond to the demands of society and the current curriculum, since "the very evolution of teaching practice (...) from the incorporation of Information and Communication Technologies (ICT), have generated new ways for teaching practices (...)" (p. 689).

Regarding the approach to innovation in the classroom of initial, primary and secondary of the ESD and evidence of the use of innovative strategies, it is confirmed that the majority show a favorable attitude towards innovation, suggesting that a way to achieve training in innovation and creativity could be achieved by implementing plans and programs of initial and continuous training where the need of the teacher is implied and include intervention or

accompanying actions, aimed at strengthening competences, mastery and didactic, pedagogical, technological knowledge and the promotion of innovation and inclusion (Booth and Ainscow, 2011) because, "teachers know (...) that educational innovation produces changes and improvements" (Martínez *et al.*, 2022, p.71) that promote inclusion and equity in the classroom (Ainscow, 2020a, 2020b). Likewise, Torres (2021) argues that "actions carried out by the teacher (...) are related to the use of teaching and learning strategies, curriculum planning, application of didactics and methodology" (p. 3), which require training and transformation of the school in favor of inclusion (López *et al.*, 2022).

Teacher training from an innovative and inclusive perspective (Ainscow, 2020a), requires coherence between the training paradigm and the profile required by the curriculum. The consulted teachers insist that there is a gap in this aspect, where innovation is the great challenge that the MINERD, MESCYT and ESD must face, based on the fact that "if the teacher has a solid reflective critical training, he/she will be better prepared and willing to any change" (Aranga *et al.*, 2022, p. 4). In addition, it facilitates "that the role of the teacher changes from a traditional perspective to an innovative digital one" (Sánchez *et al.*, 2020, p. 1). In this regard, Morales and Rodríguez (2022) propose "updating, linking and aligning the educational programs offered by universities" (p. 26) and the professionalization of inclusive teachers (Torres, 2021).

Regarding the integration of technologies to produce improvements in student learning outcomes, the challenge for the Dominican educational system remains in terms of digital literacy of teachers, adequacy of physical and technological infrastructure and access for students and teachers. However, Marín *et al.* (2022) argue that "teachers, both in the practice and in the training, should try to train themselves and know the alternatives offered by these technologies (...)" (p. 2). In this sense, most teachers of the initial, primary and secondary level of the ESD, vulnerable areas of Santo Domingo (case 1, 2, 3), lack knowledge and mastery of them. Hence, it is suggested to the MINERD to mobilize resources for the adequacy of the physical and technological infrastructure, as well as to implement a systematic and continuous training process focus on the application of current technologies and the use of

active strategies that enable innovation in the center. According to Cabero *et al.* (2019), "it will be essential to carry out personalized teacher training plans that allow placement at advanced competency levels, such as those focused on innovation and teaching leadership with ICT" (p. 369).

It seems that the weaknesses evidenced in this research are related to the development of pedagogical, didactic, digital and innovation competencies, as well as the adequacy of the learning environment; however, "teachers have to guarantee (...) the best educational results" (Ainscow, 2020a, p. 8). We agree with Malpica (2018) when saying that "it is necessary to find a balance between the development of personal learning environments and institutional teacher training" (p. 22). Likewise, Guzmán *et al.* (2021), state that "the use of ICT, TAC and PET as fundamental elements of educational innovation (...) should be considered in the design and development of the initial, continuous and permanent training curriculum" (p. 153) to promote inclusive education (Booth and Ainscow, 2011), since it will make it easier for the school to "include more proactive and creative learning strategies and experiences" (Okoye *et al.*, 2020, p. 138), and promote the teachers professionalization in the inclusion (Torres, 2021). In addition, it will "ensure comprehensive teacher training, with emphasis on content mastery, on teaching methodologies appropriate to the curriculum, participatory pedagogical tools and skills for the use of ICT with the purpose of facilitating continuous innovation (...)" (MESCYT, 2022, p. 21).

5. Conclusions

The discussion and analysis allow concluding proposals for improvement to guide teacher training from an innovative and inclusive learning perspective in the initial, primary and secondary level of ESD. These are presented based on objective 2.

To confirm the need for teachers with technological, didactic, pedagogical and innovative skills, it is suggested that the MESCYT and the IES reformulate the teacher training policy focus on inclusion, so that it is comprehensive, with quality and equity, while prioritizing innovation as the axis of initial and permanent teacher training; they must also define the characteristics of the curricula of the educational

careers in line with the professional profiles defined by the MINERD.

In line with the results, it is confirmed that although teachers have a bachelor´s degree as a minimum, a transition of the educational system is required to reduce the barriers that exist for the development of educational innovation, especially raising teaching competencies to address the teaching-learning process from an innovative and creative perspective to strengthen inclusive education. It is necessary that the MESCYT and the IES create guidelines for reformulating teacher training policy adapting to these requirements.

Although innovation is a determining factor for promoting scientific, technological development and improving educational quality and inclusion, the level of teacher training determines its effectiveness in the classroom; however, most teachers show ignorance of educational innovation and technological, didactic, pedagogical tools to carry out innovative, creative and inclusive processes. In this sense, a call is made to MINERD, MESCYT, IES and the National Institute of Teacher national institute for teacher education and training (INAFOCAM), to formulate a proposal for incorporating these approaches in initial and permanent teacher training.

The development of a creative and inclusive innovation culture requires policies and procedures that establish appropriate environmental and technological conditions to promote student participation in new production processes, with environments that facilitate student participation and inclusion. In this regard, MINERD must mobilize resources, create, and adapt environmental spaces, physical and technological infrastructure to respond to educational and innovation needs.

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Vicarious learning and types of behaviors in children on Initial Education

Aprendizaje vicario y tipos de conductas en infantes de Educación Inicial

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Abstract

This article analyze the ways in which vicarious learning encourages the reproduction of behaviors in infants of initial education. The research was born from a problem evidenced in the classroom of a private institution located north of the city of Quito in order to understand the reproduction of aggressive behavior in toddlers through vicarious learning. The methodology used was based on a qualitive approach observing and collecting information to deepen the investigation. The methods used were: the synthetic analytical, the ethnographic and the hermeneutical. In addition, the technique of direct observation of the children was used; and the interviews that were applied to two teachers. The results determined that infantes manifest different behaviors according to the activity and the envionment. Although aggressive and acquired behavior have greater incidence.Iignorance about vicar learnig by teachers was also determined. This leads to the majority of behaviors especially the aggressive see them as natural by age without considering the space or change that directly affect these behaviors. Research emphasizes the importance of considering vicarious learning as one of the aspects that affects the behavior of infants within the educational space and that can be mediated or modified processes through reinforcements. Likewise it is necessary that there are more information in Ecuador on this subject so that teachers create learning guidelines.

Keywords: lerning process, behaviour, socialization, teaching, training, early childhood education.

Resumen

Este artículo analiza las formas en que el aprendizaje vicario promueve la reproducción de conductas en los infantes de Educación Inicial. La investigación nació a partir de una problemática evidenciada en el aula de clases de una institución privada ubicada al norte de la ciudad de Quito, con la finalidad de comprender la reproducción de conductas por medio del aprendizaje vicario. La metodología utilizada se basó en un enfoque cualitativo, al observar y recopilar información para profundizar la investigación. Los métodos utilizados fueron: analítico sintético, etnográfico y hermenéutico. Además, se utilizó la técnica de observación directa a los infantes; y entrevistas aplicadas a dos docentes. Los resultados determinaron que los infantes manifiestan diferentes conductas, según la actividad y el ambiente. Aunque, la conducta agresiva y adquirida tienen mayor incidencia. También se determinó el desconocimiento sobre el aprendizaje vicario por parte de las docentes. Esto lleva a que la mayoría de conductas, especialmente agresiva, las vean como naturales por la edad, sin considerar el espacio o cambios que inciden de forma directa en dichas conductas. La investigación enfatiza la importancia de considerar el aprendizaje vicario como uno de los aspectos que repercuten en el comportamiento de los infantes dentro del espacio educativo y pueden ser procesos mediados o modificados mediante refuerzos. Asimismo, es necesario contar con mayor información en el Ecuador sobre este tema para que los docentes puedan crear pautas de aprendizaje.

Palabras clave: proceso de aprendizaje, comportamiento, socialización, enseñanza, formación, educación de la primera infancia.

1. Introduction

The study of vicarious learning contributes to a better understanding of why certain behaviors occur more frequently in the educational environment, since children from their first years attend children's centers. The lack of knowledge about learning of behaviors that are not biological, allows us to positively influence changes that can occur. Vicarious learning, by showing that most acquired learning is done by observing different behaviors of their peers, their home or even through television programs, videos or websites, is an option that helps to understand the influence of peers and society as a whole behavior in socialization.

Vicarious learning allows to process the information about the acquisition of behaviors that a person observed in his/her immediate environment. These behaviors are previously assimilated and become a kind of guide at different times and spaces by symbolic imitation. Therefore, vicarious learning processes the knowledge acquired through social interaction from mediation processes, i.e., attention, retention, reproduction, and motivation, as they are mental functionalities that help to collect, store, retain and reproduce information almost exactly. In addition, these functions are involved in the advancement of learning depending on the positive or negative reinforcement received to establish whether the visualized behavior is acquired or not.

2. Conceptual Review

Research on vicarious learning or also called learning by observation, have been carried out from the pedagogy and psychology: Reta and Ballesteros (2018) analyze several learning strategies to implement in preschool and basic through the behavior observed between peers, thus generating that infants develop vicarious learning in relation to their actions and decision making involving educational insertion.

Acosta and Alsina (2022) propose the teaching of patterns through observation and its influence on the learning of children from four to six years old. In addition, they worked in real situations to reproduce the evidence and with graphic contexts that attract the child's attention. This way they had the result that learning was more significant when performing real situations compared to the graphic resources presented.

Torres (2021) analyzes vicarious or social learning in the stage of the child from birth to three years of life, since infants from very young learn by observing the behavior of a determining social model. The author wants to implement the notion of learning in the educational and pedagogical project in La Brittany, France, in order that the children have free exploration according to their requirements and needs.

Rodríguez and Cantero (2020) address Albert Bandura's social cognitive theory about vicarious learning within the educational space. In addition, it starts with the experiment of the Bobo doll carried out in 1961 with the aim of demonstrating vicarious learning. To begin the experiment, the first group of children were exposed to observe physical and verbal aggression by an adult towards the Bobo doll, the second group of children did not observe anything. Subsequently, the first group went to a room where the Bobo doll was located and behaved in the same way as they had observed from the adult, while the second group showed acceptable behavior.

Mesa (2018) considers that different behaviors are being implemented according to what is evidenced in his environment and suggests several tactics that make it possible to approach different emotional disorders or personality in order to develop patterns of emotional bond. In addition, the author presents the cognitive-behavioral model of intervention that is used by a child psychologist in order for the child to assimilate knowledge through immediate results and vicarious learning.

Zurita (2018) examines the use or management of knowledge by imitation related to the development of role recognition in children of four years. In addition, the acquisition of new behaviors through learning by imitation and observation is given immediately. Through the identification of roles in children, it seeks to increase and strengthen their capacities. This learning, from an educational point of view, is a way of

> Acquiring new behaviors at different stages of the human being's life that is open to incomparable events without rewards or fears of possible punishment, all is given by voluntary observation in order to reproduce it in the future as a skill of its own. (p. 20)

López *et al.* (2012) address the issue considering migrants and natives related to the coupling of infants in the educational environment. This study is related to parenting practices and behavioral problems that are evident throughout the educational period, in which 176 children participated, aged four and five years. Through the analysis of the results, it is shown that there are dissimilarities in parenting practices and behavioral problems developed by children during the school day.

Murillo and Merino (2016) analyze the behavior in the integral development of the child and relate it to the general progress of the child, promoting the improvement of the behavior inside and outside the classroom. The children investigated showed low self-esteem, attention deficit, adaptation difficulties and insufficient training of female teachers. The authors of this research sought to enhance and achieve the total progress of the children according to the stages corresponding to the age and to promote the integral development through the application of strategic guidelines of behavior appropriate to the age of the children.

Illicachy (2017) approaches the discussion of behaviors from a very different perspective since it does so from the concept of Foucauldian power. Although the approach is completely different, for the research is important because it places that in many schools in the indigenous area of the city of Riobamba use punishments as ways to obtain obedience and that students carry out the activities without any rejection. These forms of disciplining are also learned as the teachers at these schools promote in the same students that they punish their peers and therefore become learned behaviors.

The varied and broad approaches focus on the different analytical aspects of vicarious learning, behavior and the factors that influence it. However, in Ecuador the topic is not directly related to behavior and is little known and researched, even more so at the Initial level. Generally, the behaviors that children manifest in the school space are attributed to age, gender, socioeconomic status or often as innate, with no major options to be modified. While many of the behaviors are known to be learned through television programs or through the Internet, they tend to be seen or categorized as bad influence, focusing on the program as such and not on vicarious learning and mediation process. Considering these aspects, the general question that guided the research is how vicarious learning contributes to the appearance of different behaviors in infants of Initial Education, and the general objective was to analyze the different types of behavior that appear and reproduce through vicarious learning in infants of Initial Education.

3. Methodology

A qualitative approach was used, which allowed to know, deepen and investigate vicarious learning through the observation and collection of information on the different behaviors of students. The methods used were three the synthetic analytical method for the theoretical part when analyzing texts found in the database such as Scopus, Google Academic Scielo, Microsoft Academic and digital repositories that helped to synthesize thoroughly basic research concepts. The ethnographic method was used to gather information through participant observation from January to July 2020 from 7h to 12h30 and thus determine the various behaviors, emphasizing the aggressive ones observed in children how these related to vicarious learning. Finally, to analyze the information, the hermeneutic method was used because it allowed interpreting the texts and relating from the general to the particular vicarious learning in the school context.

Two techniques were used: reading, which helped to understand in depth conceptual bases through authors referring to the subject, based on reliable bibliographic sources; and participant observation for collecting the data with the aim of recording information related to the subject. In addition, the teacher was interviewed to know her point of view on the different types of behavior observed during the pedagogical activities. Two instruments were used: the interview and the field diary, which helped to understand the context in which the children are immersed. An open interview was applied through an interpersonal dialogue, which allowed to ask structured questions and new questions that were emerging when addressing the research topic in order to deepen the subject, focusing on the reproduction of different behaviors through vicarious learning. These interviews were conducted to two teachers corresponding to sublevel 2. The field diary (FD) allowed to collect and describe in detail the relevant events observed during the whole class day to orga-

nize, analyze and interpret the information that was collected according to the types of behavior and the relationship that existed with vicarious learning.

3.1 Sample

The research was conducted in a private educational institution, located in the north of Quito. The institution has 25 years of experience and has been involved in initial, basic, and higher education. There are two sub-levels: 1 and 2, which worked with a teacher, an assistant teacher, and the pedagogical coordinator of the Initial area. Sub-level 1 consists of 18 students. The study population consisted of 19 children, ten girls and nine boys between three and five years old who were in the 2018-2019 academic year and two teachers of the same level. The socioeconomic status of the children's families was medium to high. Three of the families in the group were foreigners, they were in Ecuador to work, the rest were nationals. A sample was not taken, since the whole population was used.

4. Results

The results of the research are presented in two moments: the first one shows in a table the different behaviors of children during the time of observation. This classification was taken from Castillero (2018) who states that different actions or behaviors can be developed from various activities or situations based on different criteria. The second moment analyzed shows how these behaviors are related to vicarious learning. Excerpts from the field diary (FD) emphasize the type of behavior and how these occur through vicarious learning.

4.1 Type of behavior during the research

It was possible to observe different types of behaviors that the children showed during the school day. The behaviors were not static, nor always the same. However, aggressive behavior, 34 % and acquired behavior, 34 % were more frequent. While behaviors: passive, 4.3%, voluntary behavior, 6.4%, assertive behavior, 8.5%, innate behavior 12.8%.

Figure 1. *Types of behavior*

Innate 12,8%
Assertive 6,4%
Acquired 34,0%
Passive 4,3%
Aggressive 34,0%
Voluntary 8,5%
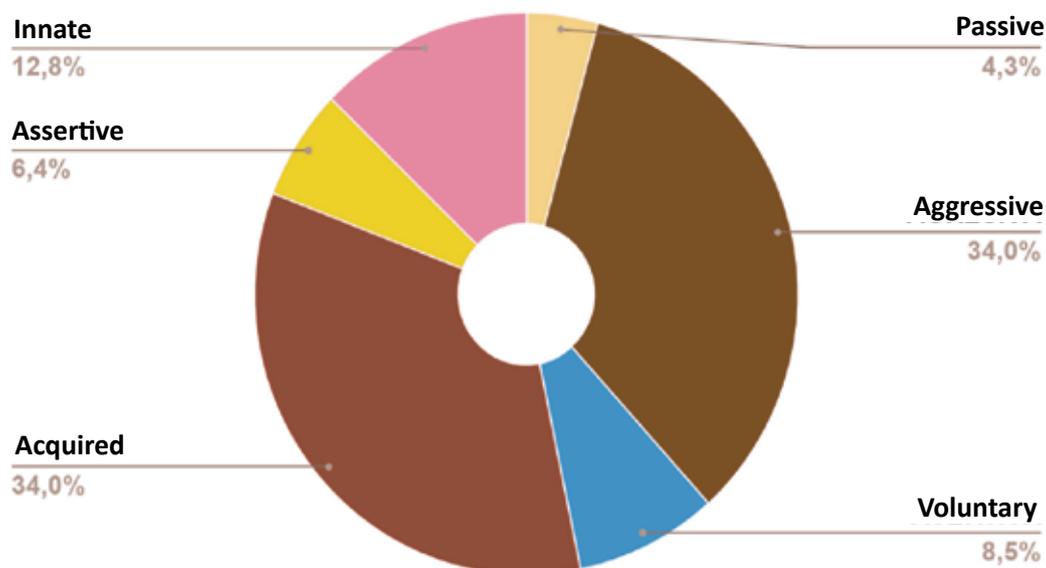
4.1.1 Passive behavior

Passive behavior could be observed especially when teachers use videos to motivate and explain certain topics. At that time, most boys and girls are

not motivated to do anything other than watching the video. One time, in a math logic class, a boy stood up from his position and tried to get some of his classmates to play with him, but they ignored him. Faced with this attitude, the boy began to play

with Play-Doh. His face showed a certain attitude of submission and frustration: if no one wants to play with him, he does it alone, without fighting or insisting (FD 21-10-2019). Despite his interest in playing with his teammates, he opted for a quiet and passive activity. This way it is shown that passive behavior is the accumulation of behaviors that will vary depending on the needs of their context, in addition, the individual interrupts or eliminates his/her own interests (Castillero, 2018).

4.1.2 Assertive behavior

More assertive behaviors were observed during the initial activities. One day at the beginning of the school day, as the students arrived, they stood up and did not want to sit in their positions to start the class. The teacher started counting 1, 2, 3... so that the children who were standing would sit, but very few sat. However, when they saw that most of their classmates began to sit down, they quickly left their backpacks in their lockers, sat down and continued counting on the teacher who had already started the initial activities (FD 06-11-2019). In this way the assertive behavior develops, since they accept their limits and present skills that aim to develop in their environment and interact with peers (Cuadros, 2018).

4.1.3 Innate behavior

At the end of the school day, when the teacher indicated that the children who would exit on Batallas Street,[1] they needed to take their backpacks to get down, and the other children would stay in the classroom, as they needed to be guided to their respective routes. At that moment a boy came crying to me, he said: "teacher, are you going to stay? because I don't want to stay here, I want to go home" (FD 21-10-2019). Thus, it was observed that innate behavior, in this case fear and insecurity, is part of the person who manifests it as a type of pre-established behavior (Castillero, 2018). Thus, the child demonstrates an affective biological need to search for safety as something innate.

4.1.4 Aggressive behavior

One day, as the students arrived to computer classes, they sat leaning against the wall as the teacher sang 'my fingers' and placed children on each computer. At that moment a boy started pushing his classmate and his classmate tried to bite his hand while the teacher called them, but they did not pay attention, since they were fighting among them (FD 21-10-2019). This is how aggressive behavior was observed, since according to Bandura's research, it is mentioned that there is a high probability that aggressive behavior is repeated because it increases the aggressive willingness at the time of observing it (García and Ocaña, 2018)

Another day it was observed that the children went to the break and Nico[2] and Alan started to play as if they were policemen, they took a girl with both arms and they pulled her from one side to the other, pushed and the girl fell to the ground, then they began to press her back and the girl started to cry. I had to separate them because the teacher did not notice what happened (FD. 30-10-2019). In this way, it is shown that the aggressive behavior represented by the child physically or verbally is developed with the aim of mastering and reaching their own needs, regardless of the welfare of others (Castillero, 2018).

According to Barbero (2018) "aggressive behavior is inevitable in all living beings, since this behavior is due to one of the most primary impulses, which also appears to guarantee our survival" (p. 41). In addition, children manifest aggressive behavior when they play, as they start from their impulses depending on the environment or what has caused inconvenience to their interests (Armijos, 2017). Teachers agree with the authors to some extent but have different views. Teacher 1 mentioned that there is no aggressive behavior in children, but attention should be paid when they play since children do not measure their strength and can attack their partner without any intention. While Teacher 2 stated that there is more aggressive behavior in boys than in girls and these behaviors occur more often during class hours.

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1   The educational institution has two exits: one for children who go home with the school bus and another through Batallas Street, in which parents pick up the kids.

2   Fictitious names used in the investigation to preserve their identity.

In addition, teacher 2 points out that there is a student with a high IQ level, which must adapt to the level and learning pace of all the peers since their parents have asked for it. However, the child is bored with the topics discussed in class and demonstrates aggressive behavior in the absence of attention from a teacher, arguing that aggressive behavior is manifested for several reasons: for being frustrated when performing some activity, fear of the unknown; for lack of attention or because these previously behavioral patterns are increasingly stable (Bouquet *et al.*, 2019).

4.1.5 Acquired behavior

On one of the school days, as the students were entering the classroom, the teacher gave them play-dough, puzzles, plastic ladders or rosettes, Ezekiel[3] was building planes with plastic ladders and making them fly, her sister also saw him making planes with plastic ladders and started running around the classroom making the plane fly (FD 30-10-2019). This behavior shows that such behavior is part of the own experience, an example or a model transmitted directly or indirectly through observation (Castillero, 2018).

In the interview, teachers 1 and 2 mention that the acquired behavior that boys and girls develop may be a reflection of what the environment at home is like and try to express it in the classroom, reason for which it is inferred that the behavior of children can be mostly acquired from family or friends who are in their close environment or transmitted through observation in television programs or video games (Castillero, 2018).

4.1.6 Voluntary behavior

One day, at the time of the meal, the teacher placed antibacterial gel in the hands of the children to be able to serve food. When the teacher began to distribute, Joaquín[4] got up and said: "I want to help you distribute the food", then the teacher assigned her the task of placing a spoon on each plate and carefully delivering each plate of food to her companions (FD 06-11-2019). In the act described above,

such conduct is affirmed by carrying out an action voluntarily and consciously. In addition, it neglects the well-being of other people to meet their own needs (Castillero, 2018).

4.2 Vicarious learning

Vicarious learning means transporting, because once the information is obtained in a symbolic way, different behaviors or attitudes are transmitted from the observed to the observer. This type of learning is an inquiry process about the organization of the behavior and the events that take place in the environment, so that the information is transformed into symbolic imitations that serves as a guide for the execution (Bandura, 1986). In addition, it focuses on the observation of different behaviors that are considered by the person to represent in a similar way; here reference is made to Albert Bandura's experiment on the "Bobo doll" (Rodríguez and Cantero, 2020).

Vicarious learning has mediation processes that influence learning, which are attention, retention, reproduction, and motivation. This process is necessary, and it plays a very important role because it helps to understand how the previously observed is internalized so that it becomes meaningful learning. In addition, it should be considered that the observed person should call the attention of observers for such behavior to be repeated in a similar way (Jara *et al.*, 2018).

Both positive and negative reinforcement are involved in vicarious learning. The first one has the objective of offering a desirable stimulus after performing a certain behavior. Through this reinforcement, which is presented physically or verbally, a conditioning is sought with a stimulus, so that the emitted response increases the likelihood of repeating it in a similar way (Megías and Llano, 2019). Negative reinforcement is intended to cause the person to increase the response of a particular behavior by eliminating the stimulus. This reinforcement is negative, since it does not consider any attitude, behavior or completely ignores it, causing the behavior to be repeated (Herrera, 2019).

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3 Fictitious names used in the investigation to preserve their identity.

4 Fictitious names used in the investigation to preserve their identity.

Below is what could be observed during the investigation:

4.2.1 Mediation processes

Behavioral learning was observed through mediation processes when students returned tired from the park and asked for water. A child began to play with the glass full of water, as two of his classmates paid attention to what his peer was doing, later the observed behavior was reproduced by the two students, having as motivation the laughter of all their classmates to see them as they play with the glass of water (FD 30-10-2019).

At another time, during classes on the relationship with the natural cultural environment, mediation processes were observed when a child begins to run around the classroom and hit objects that he finds on his way, time later the child who observed such behavior did the same (FD 21-10-2019). In the previously described, the four mediation processes are evident: attention, retention, reproduction, and motivation.

In this way, children perform mediation processes recognizing different roles that their peers reproduce in the educational space, thus increasing or reinforcing the behaviors that were imitated (Zurita, 2018).

4.3 Positive reinforcement

During the break, the teacher indicated that those who had eaten all food could go to the playground. At that moment, Romina headed to the baskets that were ordered and begins to throw the pieces of wood to the floor until finding the one that she wanted. The teacher observes and seeing that she leaves all the watered pieces on the floor makes the positive reinforcement (FD 21-10-2019).

4.4 Negative reinforcement

The negative reinforcement was observed when the teacher started teaching natural and social relationship classes and Samuel was the only child who was standing playing with his glasses, asking his classmates if they wanted to play with him, finally, he was spinning in the classroom playing with his glasses. Despite this, the teacher did not say anything, and he continued with his classes (FD 23-10-2019).

5. Discussion and conclusions

Throughout the research it was possible to identify vicarious learning in children by observing behaviors during classes, many of which are mediated by their family environment. Due to the scope of the investigation, it could not be determined whether these are mediated by television programs or the Internet. During the time the research lasted, there were different behaviors that the children represented, and these do not have a certain pattern. In addition, everything influences these behaviors such as what they expect, what children need and even the space. Assertive, acquired, voluntary, passive and innate behaviors are evident while in class, in more calm activities, while aggressive behavior is repeatedly observed in free spaces, related to play or when there are changes in the activity. However, depending on the type of behavior, they do not always have a positive or negative reinforcement by the teacher. Another aspect that is striking is that the type of aggressive behavior occurs in a rather high percentage than the rest of the behaviors, along with the acquired behavior.

Regarding the processes of vicarious learning, it was observed that there are processes that develop by a sum of responses that makes it possible to remember and manifest the observed action, which is cataloged as mediation by means of the attention to observing a certain behavior performed by another person; the retention to assimilate the observed; the reproduction to execute any behavior evidenced almost exactly and the motivation to receive any type of stimulus after performing the observed. In addition, the type of positive reinforcement influences the moment of doing a reward in a tangible way when giving sweets, toys or intangible as a congratulation for some assertive behavior. Also, the positive reinforcement is observed when correcting the aggressive behavior, always noting that their actions were not correct. In contrast, negative reinforcements are presented by ignoring any aggressive manifestations of the child. The interesting and worrying thing that could be determined in the research is that the teachers intervene occasionally, since they perceive the aggressive behavior as a normal expression of their age or as reactions to situations uncomfortable for kids, i.e., just simply child's play, since they do not always consider that some behaviors are aggressi-

ve or at other times, they do not perceive that such behaviors occur among peers.

Although the subject of vicarious learning is broad and interesting, and there are several studies related to the subject in relation to other academic levels -since it is almost invisible in basic education - it is not taken into account in a pedagogical way or is not a focused topic that involves initial education, although it is one of the first approaches to the educational field where children will develop and enhance their skills. For these reasons, the teachers are not aware of the subject and consider that the behaviors of the children are due to other factors according to their age in relation to development and interaction between peers, so they do not intervene during aggressive behaviors through more explicit mediation processes or there are not always positive reinforcements that are appropriate and can have the expected results.

At the beginning of their school years, it is essential that children observe various behaviors, especially positive in the environment around them, including the educational space. The teacher must play an important role, and, in this way, the kids will develop observed behaviors that, in addition to improving their behavior, also helps them significantly in a pedagogical way to recognize, identify and better assimilate the knowledge acquired through observation and using didactic materials. It is often claimed that children absorb everything observed from their immediate environment, as shown by Albert Bandura in his experiment with the Bobo Doll, stating that everyone learns through observation. These observations should generate wide and varied behaviors, especially when infants are in freer and less controlled spaces. Another aspect to consider is the mediation processes that the teacher must perform, encouraging above all positive reinforcements in the face of aggressive behaviors manifested by children that generate difficulty in the interrelation between peers so that these behaviors are modified and eliminated, and students learn different ways of solving conflicts.

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Quality of textbooks from the knowledge management perspective

Calidad de los libros de texto desde la perspectiva de la gestión del conocimiento

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Abstract

The COVID-19 pandemic demonstrated the importance of textbooks. They helped the learners to continue their learning in time of lockdowns. The period also raised a question: What features has to have a textbook to support learning in learner's full or partial isolation? The objective is to identify textbook's concepts and style leading to the isolated learner's outcomes equivalent to those in-classroom education. The methodology has a qualitative approach; we confront subjects' learning objectives and textbooks' content, in particular, the presence of relevant explicit and tacit knowledge. Explicit knowledge is always present because it consists of texts, illustrations, etc. Authors may forget about or occasionally neglect tacit knowledge: best practices and heuristics. The learners then cannot receive their subject's holistic knowledge, because they are unable to complete mental lifts between Revised Bloom's Taxonomy's levels. As results key features of mental lifts are identified. Based on them, strategies helping to balance explicit and tacit knowledge necessary for achieving subject's learning objectives are provided. The appropriateness of the balancing strategies is discoursed using examples from two distant subjects: Poetry and Geometry. In a stepwise manner, these examples address all mental lifts and show how such sequences can expand the learner's knowledge. To conclude the discussion demonstrated the suitability of exploiting complete sets of mental lifts. The authors can use it to make certain that no relevant tacit knowledge will absent in their materials.

Keywords: Textbook production, distance education, know-how transfer, knowledge management, self-instruction, textbooks.

Resumen

La pandemia de COVID-19 ha demostrado la importancia de los libros, pues ayudaron a los estudiantes a continuar su aprendizaje durante el confinamiento. Sin embargo, este período también planteó una pregunta: ¿Qué características debe tener un libro para apoyar el aprendizaje en el aislamiento total o parcial del alumno?. El objetivo es identificar los conceptos y el estilo de los libros que conducen a los resultados del alumnado en comparación a los de la educación en el aula. La metodología tiene enfoque cualitativo; se comparan los objetivos de aprendizaje de las asignaturas y el contenido de los libros, en particular la presencia de conocimiento explícito y tácito. El conocimiento explícito está siempre presente porque consiste en textos, ilustraciones, etc. En ocasiones, los autores pueden olvidarse u ocasionalmente descuidar el conocimiento tácito: mejores prácticas y heurísticas, por lo que los y las estudiantes no pueden recibir el conocimiento integral de su asignatura, porque no pueden completar los pasos mentales entre los niveles de la Taxonomía Revisada de Bloom. Como resultados se identifican las características clave del impulso mental; a partir de ello, se proporcionan estrategias que ayudan a equilibrar el conocimiento explícito y necesario para alcanzar los objetivos de aprendizaje de la asignatura. Se articula la adecuación de las estrategias de equilibrio utilizando ejemplos de dos temas: poesía y geometría. De manera escalonada, estos ejemplos abordan todos los impulsos mentales y muestran cómo pueden expandir el conocimiento del alumno. Para concluir se demostró la idoneidad de explotar conjuntos completos de impulsos mentales que los profesores pueden utilizar para asegurarse de que no falte ningún conocimiento tácito relevante en sus materiales.

Palabras clave: Producción de libros de texto, educación a distancia, transferencia de conocimientos, gestión de conocimientos, autoinstrucción, libros de texto.

1. Introduction

The COVID-19 pandemic showed us the importance of textbooks and teaching aids for pupils and students. In time of limited communication, they allow the learners to continue their learning. The lockdowns on their peaks stopped the school attendance. The classes had to move into the cyberspace. Eurostat data (2021) show that before the pandemic, the saturation of households with the Internet in Slovakia was 85% in 2019. It grew up to 91% in 2020. The leap stipulates that parents are interested in their children's education. The same data indicate that almost 10% of households (and, consequently, their children) have not got their Internet connection.

(Bednárik *et al.,* 2020) state that the pre-pandemic support of distance education was both insufficient and non-systematic: The standards of e-learning were not specified; its forms, curricula and learning materials were not prepared. A half of teachers did not completed any training and was not offered sufficient room for online education. Many families, in particular those with several children, suffered due to their infrastructure – insufficient broadband, less computers than children and/or absence of quiet places to hide in during classes.

In such cases, textbooks and teaching aids represent a survival strategy. To be effective, they must be "self-supportive" i.e. to allow the learners making their progress with minimum or no educator's support. Quality teaching and learning aids help their owners to advance regardless teacher's presence (Hvorecký and Korenova, 2018). Even if the students' progress would be slower, their knowledge would expand.

In this paper, we study the features of such aids. Using an innovative way, we discuss them from the knowledge management perspective in order to propose a textbook design model. Textbooks are considered as "devices" which transfer knowledge to learners' minds. To complete the transfer, the textbooks should:

- Incorporate the subject's relevant explicit and tacit knowledge,
- Guide their readers up through all levels of Revised Bloom's Taxonomy – RBT (Bloom *et al.,* 1956; Anderson and Krathwohl, 2001; Wilson, 2016).

We have to underline the necessity to deliver both explicit (factual) and tacit (contextual) knowledge. Explicit knowledge is formal and codified – contemporary textbooks are full of it. They mostly presume the presence of educator to achieve student's progress (see e.g. Kónya and Kovács, 2022; Ziatdinov and Valles, 2022; Körtesi *et al.,* 2022).

Tacit knowledge is more difficult to express or to extract because it is primarily (and often exclusively) in our heads – in our wisdom, experience, insight and intuition. Its transfer by means of writing or verbalizing is much more difficult (Pardue *et al.,* 2000). In classrooms, it originates during verbal and non-verbal communication among teachers and learners. Textbooks and teaching aids cannot do so directly but they may enhance it for example by appropriate formulation of assignments – the tasks evoking deeper thinking. The ways of facilitating learners' deep knowledge vary and often exploit graphic representations (Schmid and Koreňová, 2022 Záhorec *et al.,* 2018; Žilková *et al.,* 2018).

Below, design of textbook structure nudging their readers to move from mechanical perception to holistic learning is proposed. The idea is a free continuation of (Hvorecký and Koreňová, 2018) and a part of our longitude research. It is now turning to the communication among learners in Virtual Reality educational environments (Korenova *et al.*, 2023).

2. Method

2.1 Definition of quality

Meriam-Webster dictionary (n.d.) defines quality as (a) how good or bad something is, (b) a characteristic or feature that someone or something has, something that can be noticed as a part of a person or thing, (c) a high level of value or excellence.

To assess quality of an entity, one has to discuss its function and its ability to fulfil users' expectations. The textbook quality can be assessed from two points of view: as an educator's companion and as a learner's guide. We are focused on the second aspect – the ability to support pupil's self-learning and its potential to develop subject-specific tacit knowledge. We study whether the textbook positively or negatively supports self-learning processes and how it is done. Hopefully, our approach is general enough to allow teachers of other subjects to get inspired.

2.2 Knowledge Management

Education enables children to acquire knowledge and skills that will help them to become successful members of society, and grow into good and accomplished individuals (Glaser, 2013). They have to acquire and to develop to kinds of knowledge: explicit and tacit. Explicit knowledge is formal and codified using an agreed notation, captured and recorded in books, pictures and videos. Tacit knowledge is in our brains i.e. seemingly impossible of "smuggling" it into learning materials. This obstacle should not stop us from trying.

The Knowledge Management theory (Dalkir, 2017) explains the knowledge development as a transition process between its various forms. Our preferred approach – the SECI model (Nonaka and Takeuchi, 1995) – is a subject-independent model describing knowledge development as a process of perpetual transition between explicit and tacit knowledge – see Figure 1. Its original purpose was to demonstrate the way knowledge is developed inside manufacturing companies and organizations. Due to its general character, it can be applied to any situation where knowledge development is a part of its internal processes.

Figure 1. *The SECI Model*

		output knowledge	
		Tacit Knowledge	**Explicit Knowledge**
Input Knowledge	Tacit Knowledge	Socialization	Externalization
	Explicit Knowledge	Internalization	Combination

The knowledge development process start with *Socialization*. Owners of tacit knowledge interact with bearers of (different, often lower) tacit knowledge. It is performed using interpersonal communication and/or intrapersonal insights. This is the most traditional form of learning and is present in any human community.

During *Externalization*, informal individual knowledge is presented into person-independent one. Pieces of tacit knowledge are presented in a standardized, commonly accepted, comprehensible format (numbers, texts, graphs, formulas, etc.). They become independent on the personality of its author, his/her geographic location or the moment of creation – and ready for their global distribution.

During *Combination*, these formalized pieces of knowledge can be processed by their users: manipulated, interpreted, rearranged, deployed and so on. In this way, the users generate new pieces of explicit knowledge.

Through *Internalization*, the new pieces of knowledge become an integral part of knowledge weaponry. People incorporate them into their brains, integrate them with their present knowledge and extend their intellectual power.

The name S-E-C-I comes from the order of activities. The innovation processes in organizations usually starts with brainstorming. Innovative ideas are accumulated and settled (S). These (still foggy) concepts are then formalized and more targeted (E). The promising ones are elaborated and made functional (C). Finally, the organizational processes/structures are modified in order to incorporate the new ideas (I). Then, the loop can start again, i.e. the SECI model represents a life cycle of knowledge with its multiple reincarnations.

In our case, we have to interpret the SECI activities with respect to pedagogical aims. Socialization includes storytelling, a dialogue, an interactive lecture, couching, mentoring etc. Externalization addresses creative writing, the selection of the most appropriate graph, illustration or diagram and so on. Combination in different subjects addresses their typical methods and techniques.

- In Mathematics: arithmetic operations, transformations of formulas, geometrical constructions, and others;
- In Poetry: Creation of new poems, rhymes, rhythms, resemblances, etc.
- In Architecture: application of new technologies, drawing building plans, understanding the space, and so on;

- In Engineering: machine invention, design and construction.

Every field exploits its own form of Combination.

Internalization includes acceptance of the Combination outcomes and its transfer to mental constructions. The individuals adopt new concepts and start using them, discussing them and applying them in their reasoning. Without proper internalization, one can remember and repeat the Combination processes but will not become comprehending their deep message.

The SECI is a versatile model of education. A typical "oldtimer" are problem solvers. By resolving a series of similar problems, the learners not only become more skilled in the operations and procedures but also accumulate experience which later help them to recognize the problem of the same category. This approach is known as Problem-Based Learning (Gijselaers, 1996). Tacit knowledge development is often discussed and developed by Communities of Practice (Duguid, 2012). Bloom's taxonomy of learning objectives corresponds to the conclusion that "the understanding that not all knowledge and expertise resides in the academy, and that both expertise and great learning opportunities in teaching and scholarship also reside in non-academic settings" (Fitzgerald *et al.,* 2002). Our below approach exploits the SECI model born in a non-academic environment. The application of Knowledge Management in educational environment becomes more and more popular (see, for example, Tee and Karney, 2010; Saunders, 2022). The SECI model has been applied to the analysis of various education-related activities like effective teamwork (Dávideková and Hvorecký, 2017) or managing not-fully-rational knowledge (Hvorecký *et al.,* 2013).

Further, we exploit it for the specification of design and development of quality textbooks. Our principal research method is Learning and Development (Harrison, 2009). After selecting a phenomenon (a piece of knowledge we wish to deliver to learners), its key features are analyzed. Then, the textbook author crafts a problem/task which requires to apply previous knowledge and experience of the learner. Naturally, the step from the previous knowledge to the newly-born one must be rather small to allow its "rediscovery" by untrained indi-

viduals. Due to their effort, the learners may gain a piece of knowledge which was not put down in the textbook. Consequently, the textbooks may offer tacit knowledge by posting it "between lines". When properly incorporated, this strategy opens door to unwritten but potentially useful pieces of knowledge. Such textbooks will allow learners to find them either independently or with minimum support from a third body.

2.3 Reaching Learning Objectives

We have to specify the learning objectives first. Then, they have to be expressed by pieces of knowledge (both explicit and implicit) and, finally, to design patterns which serve to the learners as generators of their (unknown) instances. Each generator should allow them to forward from isolated examples to their "mass production" applicable in the particular discipline.

The key to success is to identify the type of tacit knowledge to be delivered to students. Bloom's taxonomy offers an optimal scaffolding. It specifies a hierarchy of levels the person should achieve as a result of his/her learning. Most frequently, it is presented by a series of verbs Remember, Understand, Apply, Analyze, Evaluate, and Create (sometimes denoted as Synthesize) interpreting in the following way:

I **Remember** data, formulae, terminology, laws, ...;
II **Understand** relationships, purpose, links, ...;
III **Apply** in a new situation, upon a request, …;
IV **Analyze** significant features, identify reasons and potential risks, ...;
V **Evaluate** statements and their supportive arguments, assess outcomes, compare advantages and drawbacks, ...;
VI **Create** plans, design and develop, produce, innovate, …

The order of taxonomy levels expresses growing complexity of thinking. According to (Lord and Baviskar, 2007), the taxonomy allows the instructor to gauge the level of questions asked on the exams. For example, "if a question on the test asks students to identify a structure defined in a sentence or shown on a graphic, the instructor knows the query fits in level one …" If students are asked to

interpret a graph or predict what would happen if a certain event was to continue, the question would require stronger thinking and resides at a higher level. Table 1 shows a lists of verbs typical for tasks at each level (Clark, 2004).

Table 1. *Leading verbs in tasks*

Level	Leading verbs of the tasks
Remember	Define, duplicate, list, memorize, recall, repeat, reproduce, state
Understand	Classify, describe, discuss, explain, identify, locate, recognize, report, select, translate, paraphrase
Apply	Choose, demonstrate, dramatize, employ, illustrate, interpret, operate, schedule, sketch, solve, use, write
Analyze	Appraise, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test
Evaluate	Appraise, argue, defend, judge, select, support, value, evaluate
Create	Assemble, construct, create, design, develop, formulate, write

Before testing their knowledge, the learners have to gain it from a relevant source: their educators or literature. This paper discusses the principles of creating teaching aids which may reduce supportive person's presence. In a sense, our aim is "reverted" to the traditional SECI model. Prior to extracting knowledge from students, we have to implement it to their brains. To a certain degree, it is done today. For example, Mathematics textbooks contain both solved and unsolved problems. Every solved one expresses a piece of explicit knowledge – an application of solution method. The unsolved ones may be formulated in three ways: (a) as another application of the same accustomed method, (b) as a more complex task in which the membership to a family of problems must be identified first and only then the problem can be solved, (c) as an open problem absolutely new to the learner.

The latter two groups require tacit knowledge of higher ("meta") level. As the ability to formulate an analogy or to demonstrate creativity belong to tacit knowledge, problems of these categories provide opportunities to "smuggle" tacit content. Naturally, the first tasks requiring discoveries must be transparent and easy to solve. Otherwise they could repel the learners and they would resign to them. The textbook authors might offer hints, too.

Textbooks have to contain a variety of fundamental strategies of tacit knowledge development. They should support the readers' comprehension of questions presented in Table 1 and nudge them to react appropriately. Examples are given below.

Before we do so, we have to stress an additional aspect of the process. Unlearning wrong practices is not an easy task (Love *et al.,* 2018; Jordan and Karunananthan, 2020). To protect students from gaining faulty knowledge, the authors should also point to potential errors in solutions and explain what makes them inappropriate. As no one can know the exact wording of the future (not-yet-posed) questions, an optimal explanation should offer examples of both ("positive" and "negative") tacit knowledge. Let us exemplify it. Two next tasks look as problems solvable by "the rule of three":

- *One horse weights 700 kg. What is the weight of 10 horses?*
- *A horse can carry a load weighting 60 kg. What load can be carried by 10 horses?*

They offer an example of "positive" analogy: the solution of the first one gives a hint for solving the second one. It indicates that there is a group of "rules of three" problems. Their common formulation sounds: *The feature X of a horse has Y as its value. What is the value of feature X of 10 horses?* (With 10*Y as their solution).

The "negative" case shows that there are exemptions and not all problems which look similarly can exploit 10*Y as their outcome: *One horse runs at speed 20 km/h. What is the speed of 10 horses?* A wrong analogy suggests "10 * *20* km/h". Its (correct) rejection requires additional (contextual) knowledge saying that "the speed of caravan is the speed of the

slowest camel". If a student makes a mistake, he/she can be prompted to the right conclusion by asking whether the speed of ten cars driving on a highway also sums up.

There is another "negative" variation of the same problem: *One horse is of white color. What is the color of 10 horses?* It demonstrates that the visual similarity of two texts does not assign them to the same category of problems. This problem even does not belong among mathematical ones. Its non-solvability using any mathematical method is an important piece of knowledge in Mathematics.

The above statements propose the pillars of teaching aid design:

- Present and explain standard terms, methods and approaches typical for the given field;
- Present also typical incorrect solutions and explain why they are wrong or do not function;
- Demonstrate the limit of the discipline; show that no field of human knowledge is omnipotent.

As a result, the learners will become capable do more than just to demonstrate their knowledge by responding future questions. They will understand whether the question belongs to a field and to explain why. They will be capable of discussing whether a problem is solvable by the means of the discipline or not.

The examples below will illustrate the introduction of these concepts at each level of Bloom's hierarchy in the belief that the field specialists can create appropriate ones for their particular fields. To achieve that, we interpret Bloom's hierarchy in a less traditional way – as a series of mental lifts allowing more and more complex reasoning corresponding to a growing intricacy of problems.

2.4 A specific of the lowest level of Bloom's taxonomy

The first level – *Remember* – presumes the simplest reasoning. It requires no more than an adequate reaction to "define, duplicate, list, memorize, recall, repeat, reproduce, state". No tacit knowledge is needed except of the capability to interpret the request. It corresponds to „remembering by heart" – a word-by-word repetition done without any comprehension of meaning. A common example is *Jabberwocky*, a poem by Lewis Caroll (1865). There are its first four verses:

> *Twas brillig, and the slithy toves*
> *Did gyre and gimble in the wabe:*
> *All mimsy were the borogoves,*
> *And the mome raths outgrabe.*

It is an extreme example of a first-level piece of knowledge. It is remembered, recited and popular despite having no meaning.

2.5 Lifting to the higher levels

Unlike the first level, in all higher levels concept's comprehension is a must. Reaching the next level requires additional knowledge – a mental lift. Under the mental lift we understand a qualitative upgrade in learner's knowledge similar to Archimedes' heureka "jump" change (Deckert, 2007). It presumes an inquiry approach and is suggested as a key approach to quality education (Trash, 1978).

Table 2 sums the properties of mental lifts. Every mental lift occupies a row. Its leftmost member represents learner's initial knowledge, the middle one the target one. Its right member describes the learning objectives which presence demonstrates that the mental lift has been done. The main aim of our research was to identify the tools and strategies which develop these elements of learners' tacit knowledge which facilitate the particular learning objectives.

Table. 2. *Neighboring pairs in Bloom's taxonomy*

First member	Second member	Mental lift
Remember	Understand	To become capable to explain the concept and/or the relationship within its field-related context.
Understand	Apply	To find a way the concept/method/procedure can resolve a given problem (when the problem is solvable within the field).
Apply	Analyze	To learn to explain one's solution, its steps or components and their role in the process.
Analyze	Evaluate	To achieve such level of knowledge when the solving method becomes more important than the problem itself; to compare two or more related solution methods and to contrast their advantages and disadvantages.
Evaluate	Create	To build one's own structure of knowledge and become competent to exploit it for forming original solutions, concepts, objects or problem solving procedures.

3. Results

All textbooks contain externalized (i.e. explicit) knowledge: written text, tables, graphs, illustrations and so on. For the aims of this paper, these items are the sole information source of students' learning. In other words, the learners see the left members of Table 2 as pieces of explicit knowledge. The complete their mental lifts, they have to acquire this explicit knowledge and join it with tacit knowledge they acquire by exploiting the textbook's "between-lines" information.

From the point of view of the SECI model, all textbooks are information sources encoded using formal symbols i.e. products of Externalization. Their authors externalized their tacit knowledge, while the readers read them in order to achieve its Internalization. In an optimal case, tacit knowledge (of the author) will be replicated in the learner's mind. It implies that our considerations have to start in the Combination field – with the texts interpreted as pieces of externalized knowledge. The learners read and study them to get them internalized. After doing so, they can think about and discuss them. From the point of view of SECI, the learners "socialize" (individually or in groups). Nevertheless, to demonstrate their comprehension, they must then present their recently gained knowledge in a pre-defined, requested format i.e. to externalize it. The loop is closed.

3.1 Poetry

Let us explain the role of mental lifts by continuing our Jabberwocky example. Its words do not have

meaning – they simply follow a rhythm and rhymes. Nevertheless, one can build a quite deep knowledge on poetry upon it. Let us move upon the ladder:

- Understand: The step to it is based on posing the questions: *Why does the text resemble a poem? What is a rhyme?* The answer should be accompanied using a series of onomatopoetically sounding pairs of words from Jabberwocky or other poem as well as some pairs which do not rhyme. The textbook should contain good rhymes, bad ones as well as "foggy" ones – those of questionable quality. The last ones can later serve as reference points during discussions on rhyme quality later.
- Apply: *Find other pairs of rhymes.* For this mental lift, the quality of rhyme does not play any role. The text should prompt the student to produce anything he/she considers being a rhyme.
- Analyze: The writing should explain *what makes good quality rhymes*, which ones are not such and why. Then, the learner should explain which of his/her previously formed rhymes he/she considers the best one(s) and why.
- Evaluate: Sample poems of various quality are posted. The students are asked to make an independent analysis of poems. They for example should *study the rhymes not only as isolated words* but discuss whether they comply with the poem's main idea. One may start discussing gentler distinctions like "not excellent but supporting the poem's style" or "intentionally bad in order to catch the reader's interest" and

similar. Their conclusions should express the role of the rhyme as a tool for expressing idea, not only as an esthetic element.

- Create: The students are asked to *create a poem.* As they may face problems with their leading topic, their outcomes might be a Jabberwocky-like non-sense poems.

3.2 Geometry

To achieve a deep and relevant comprehension of the learning materials, they must be interesting/attractive. In poetry, Jabberwocky is the bait. In planar geometry, symmetry is a good bait – see Figure 2. It catches learners' attention by presenting a body which exploits mathematical principles to express beauty.

Figure 2. *Symmetrical tesselation*
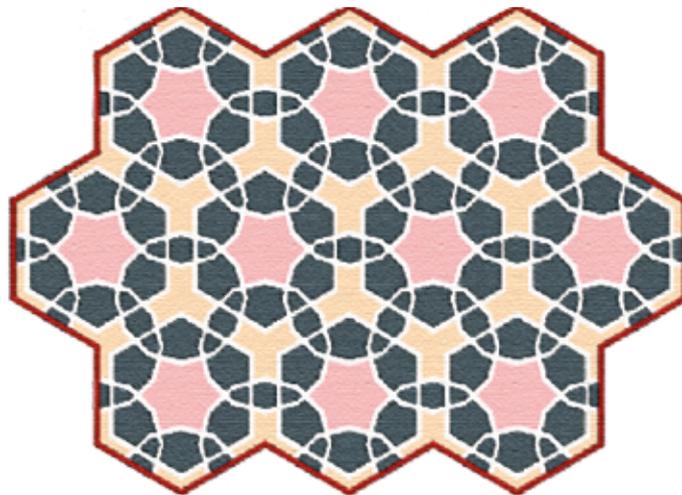
Note: (Majewski, 2011)

There is another similarity between the baits. Both poems and symmetrical patters are uneasy to create. Making them is a challenge. According to (Meriam–Webster, n.d.), symmetry is a correspondence in size, shape, and relative position of parts on opposite sides of a dividing line or median plane or about a center or axis. Around us, there are many items featuring symmetry: flowers, snowflakes, human faces, etc. As a result, the learners can also understand the connection between them and the learning matter. A series of mental lifts should therefore lead them from their intuitive familiarity with symmetry to its geometrical interpretation and construction.

- Understand: *Is this object symmetrical or not?* No one can remember all symmetrical objects he/she have seen but can easily recognize them even without a specific course. It is because each of us intuitively learned the concept long before enrolling his/her primary school. The textbook should show many figures, stress that the list is not exhaustive and ask for its expan-

sion. Less standard responses like "openings on a violin, a bridge or a church façade" should be higher valued, especially when they address rotational symmetry or point symmetry. The "negative" part of this mental step has to point to nonconformities – the ability of learner to recognize why a pattern is not symmetrical and what are the deviations in it.

- Apply: *Create a symmetrical object!* There are many ways to do it. For example, by cutting a folded paper one can create objects with reflectional symmetry, point symmetry and rotational symmetry. The examples on each of them should provide the text. Then the learners should be asked to make these symmetrical objects – and also to explain what cuts may distort symmetry.
- Analyze: Now it is time to *distinguish among different types of symmetry.* The text will explain the principles of reflection and rotation and asks the learners which operations lead from Pattern A to Pattern B. Encourage the

learners to investigate/measure distances of identical elements from the folding line and/or the body center. Their observations should be expressed using terms of geometry.

- Evaluate: The learners should *discuss their obtained data* and look for differences between different types of symmetry. Their outcomes should guide them to understanding the dependence on the distance from the axis (in the case of reflection) and from the center (in the point symmetry). The advanced problems may address the rules of rotational symmetry. All findings should be "translated" into the language of geometry.
- Create: The student will *create symmetrical objects using the geometrical rules* following the previously learned rules and procedures.

4. Discussion and conclusion

Textbooks should provide a lot of space for individual work. The problem should be of both sorts – solved and unsolved – to give them a necessary feedback and to minimize their blundering. At the same time, the country-wide school systems expect a certain unity of learning objectives in order to "unite" outputs of education across the country and, in a way, worldwide. For a comparison, the educational standards for symmetry valid for the U.S.A. and the Montana state (Knuchel, 2004):

"National: 1. Identify and describe line and rotational symmetry in two-dimensional shapes and designs. 2. Predict and describe the results of flipping and turning two-dimensional shapes. 3. Build and draw geometric objects. 4. Create and describe mental images of objects, patterns, and paths. 5. Describe location and movement using common language and geometric vocabulary.

State: 1. Explore properties and transformations of geometric figures. 2. Use geometry as a means of describing the physical world."

These goals are in a good correspondence with Geometry goals around the World; they are also closely related to above mental lifts. Their order in the syllabi and the method of achieving them depends on the textbook authors. In our case, they correspond to the constructivism and problem-based learning. To catch learners' attention, one should exploit their familiarity with the taught concept and childish curiosity. The combination of these factors allows bridging their current intuitive knowledge and future advanced one. In accordance to (Brindha, 2018), it not only facilitates the student centered pedagogy but affects digital approaches for applying the principles of good assessment and instant feedback.

Notice that the steps – the mental lifts – are short and always lead from a piece of explicit knowledge to another piece of explicit knowledge:

- Understand ends with the ability to exemplify the concept using real-life examples;
- Apply leads to presenting learner's solutions;
- Analyze results with learner's findings of concept's properties;
- Evaluate targets quality of these concepts from the point of view of the given discipline (poetry, geometry, and so on);
- Create crowns the process with the learner's demonstration to exploit his/her knowledge for crafting original products.

Considering the terms of SECI model, each mental list starts in the Combination field. To complete his/her mental lift, the learner first combines his/her previous knowledge with the proposed one. He/she is supposed to internalize it (read and comprehend the text, study the picture, interpret a drawing,…). Due to its Internalization, he/she is capable of thinking about it. Notice that Socialization includes not only dialogue with others but also self-reflection ("talking to yourself"). In all cases, the activity should motivate and inspire him/her. Finally, the outcome is externalized and presented in an appropriate format – the given mental lift is completed.

The Socialization stage is the most critical for the success of learning. Without a relevant mental processing (or a guidance), the learner can fail on making desired conclusions. According to (Aguirre-Aguilar, 2020), learners need feedback. As a best solution, an expert evaluation and/or advice is recommended. In traditional education, the expert equals the teacher. As we are considering an (at least partial) isolation typical for the online environment, it can be a companion website (Nilssen, 2015). In general, the support can be done by anyone or anything capable to facilitate learner's knowledge.

The textbook which contains all mental lifts steers knowledge to its higher quality. The readers

will not only be capable of more intensive comprehension of content, they will incorporate their authors' knowledge more easily and in accordance with the learning objectives and their previous knowledge structures.

Quality is enhanced by modified order of SECI steps:

- In traditional classrooms, the step order is S-E-C-I (i.e. from tacit knowledge to tacit knowledge). The teacher introduces the topic using an informal (verbal) way and only then expresses it in its formal (written) way. In the end of the loop, learners demonstrate its possession during interaction with educators and classmates.

- In above considerations, the order is C-I-S-E i.e. it goes from explicit knowledge to explicit knowledge. The loop starts with reader's interaction with textbooks. He/she then internalizes their content and mentally processes it. This process ends with gaining a new piece of knowledge. To prove its possession, the learner presents it using concrete texts, illustrations and data.

To make the textbook approaches close to those in classrooms, the textbook should exploit a less formal writing style. Such style often appears in books on popular science, for example (Chamovitz, 2017, Sverdrup-Thygeson, 2018) on biology or (Hvorecký, 2018) on physics. Improved legibility of communication plays a crucial role in other fields too, for example in database query design and development (Hvorecký *et al.,* 2010).

Despite of the textbook capability to support self-learning, the learner's progress will often be quite slow. Not to repel readers, the books must not be heavy and their visual and wording style have to be attractive. There should be enough tasks allowing the reader to train themselves using sufficient numbers of correct and incorrect solutions.

For the authors, it implies the necessity to incorporate various hints facilitating learner's subconscious knowledge. Forming and exploiting several stepwise series of tasks following the Bloom's taxonomy ladder is a must.

It implies that the proposed method closely relates to microlearning, too. (Hug, 2007) underlines

that the role of microlearning has to be reconsidered deeply despite the fact that it has been an implicit part of discourses for decades. As we have seen above, this methodology is applicable to the textbook creation, too.

Two additional aspects have to be underlined:

a. The portions of new knowledge must be formed as "edible chunks" – small and self-supportive. They should be a combination of brief explanations mixed with relevant simple tasks. By "simple" we mean their capacity to be comprehended by all readers. Responding them will enhance the readers' self-confidence. Naturally, there must also be non-trivial questions challenging them but their higher difficulty must be clearly stated. It especially applies to the examples of wrong or incomplete solutions because they could confuse the learners and prohibit their comprehension of subtle deviations from the correct ones.
b. In principle, the order of sequence elements should follow Bloom's hierarchy. The learner should move through the levels one by one. The exceptions are possible but they should remain exceptions. For example, habitually it is not easy to decide whether to prefer Evaluate to Create – or to use their opposite order. The writer should eliminate both options.

Finally, let us to underline that writing textbooks is an art. The authors should be given their liberty to follow their wisdom and their privilege to reject any of our above suggestions. Nevertheless, every art has to follow some elementary principles. For example, the art of sculpture has to respect the principles of statics otherwise the sculpture will collapse. Only those who successfully combine the principles with their own creativity produce successful results.

Acknowledgement

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Publication guidelines
(Normas editoriales)

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 **manuscript**, 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 evalua-

ted 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

Guidelines for Headings, Tables and Figures

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.

In the case of LaTeX/Overleaf, figures must be loaded in the template in original PDF format in order to maintain its quality, since conversion from other formats can lower the quality of the figure. In the case of Word, in addition to being incorporated in the document, figures must be sent as complementary material when submitting the file on the OJS of "Alteridad", having a quality higher than 600 dpi in TIFF, JPEG or PNG.

5. Fees and APC

«Alteridad» is an Open Access journal, included in the Directory of Open Access Journals (DOAJ) that offers all its production online for the scientific community. There are not fees throughout the editorial process for the publishing articles, including scientific review, layout and translation thereof. There is no publication fee, no Article Processing Charge (APC) associated with this publication, neither for authors nor for readers. The journal is also licensed by Creative-Commons Attribution-Non-Commercial-Share Equal (RoMEO blue journal), which allows free access, download and archive of published articles. All expenses and financing of «Alteridad» derive from the contributions made by the Salesian Polytechnic University.

6. Ethical responsibilities

Each author shall submit a responsible statement of authorship and originality, as well as their ethical responsibilities.

- **Originality:** The works must be original and should not be evaluated simultaneously in another publication; hence, the authors are responsible to comply with this standard. The opinions expressed in the published articles are the responsibility of the author/s «Alteridad» as CrossRef®'s international partner, uses the CrossCheck® and iThenticate® anti-plagiarism tool to ensure the originality of the manuscripts.
- **Authorship:** The list of signatory authors should include only those who have contributed intellectually to the development of the work. Collaborating in data collection is not sufficient criteria of authorship. «Alteridad» rejects any responsibility for possible conflicts arising from the authorship of the manuscripts published.
- **Use of Artificial Intelligence:** authors should indicate clearly and specifically

whether they used Artificial Intelligence tools for preparing their manuscript and analysis, indicating to what extent and which Large Language Model (LLM) or tool was used. They must include it as a note at the end of the manuscript as for section 4.3.

- **Transmission of copyright:** the transfer of rights of the manuscript published in «Alteridad» will be included in the cover letter. The Salesian Polytechnic University (the publisher) has the copyright of published articles; it favors and allows the reuse of these under the license indicated above.

7. Promotion and dissemination of the published article

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».

«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-No-Comercial-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 desesti-

mará 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 manuscritos 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 lógi-

ca 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.

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- **Uso de Inteligencia Artificial**: Los autores deberán indicar de manera clara y específi-

ca si utilizaron herramientas de Inteligencia Artificial en la preparación de su manuscrito y análisis, evidenciando en qué medida y qué *Large Language Model* (LLM) o herramienta fue usada. De ser el caso, incluirlo como nota al final del manuscrito de acuerdo a lo indicado en la sección 4.3.

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