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15 YEARS



MASKANA (searching in kichwa), the name of the scientific journal of the ViceRectorate for Research of the University of Cuenca (VIUC), relies directly to the definition of research, which in the broadest sense means searching for advancement in knowledge via gathering of data, information and facts.

MASKANA (búsqueda en kichwa), el nombre de la revista científica del Vicerrectorado de Investigación de la Universidad de Cuenca (VIUC), se refiere directamente a la definición de investigación, que en el sentido más amplio se entiende como la búsqueda del avance del conocimiento a través de la recopilación de datos, información y hechos.

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Editorial: Fifteen years of Maskana journal

Editorial: Quince años de la revista Maskana

Monserrath Jerves

Director of Maskana – University of Cuenca

As Vice-Rector for Research and Innovation at the University of Cuenca, it is an honor to present the celebration of the 15th anniversary of Maskana, a scientific journal that has stood out as a benchmark in the field of knowledge and exploration since its first edition in the first semester of 2010. Over the years, we have witnessed the growth and evolution of our institutional journal, which has become a fundamental platform for researchers in various fields of knowledge.

The term “Maskana” comes from the Quechua language and means “search” or “exploration,” reflecting the essence of research, which involves advancing knowledge not only through the collection and analysis of data but also through reflection and intercultural dialogue, recognizing the plurality of knowledge.

With the support of the Research Directorate of the University of Cuenca, Maskana was conceived as a teaching and learning tool aimed at promoting the dissemination of science among young researchers and students. Since its creation, it has maintained a commitment to publishing two editions per year, covering the humanities, social sciences, biological sciences, health sciences, and exact sciences. This multidisciplinary approach is essential, as it allows the complexity of reality to be addressed from multiple perspectives and facilitates communication and collaboration among researchers from diverse disciplines, thereby creating knowledge networks that optimize research and its applicability to problem-solving.

Throughout its history, Maskana has experienced transformative moments that have driven its growth toward excellence. In 2015, the journal was included in the Latindex catalog, version 1.0. In 2016, the digitization process began, culminating in the obtaining of the electronic ISSN in 2017, a milestone that expanded access to published articles and the knowledge generated by the authors. The journal advanced to version 2.0 of the Latindex catalog in 2019, thus consolidating its presence in the scientific field.

With the creation of the Vice-Rectorate for Research and Innovation, the need to strengthen the journal with a focus on greater reach and quality became evident. Since 2022, the editorial team has been strengthened, and strategic decisions have been implemented, including adopting a new image, launching mass calls for submissions, and strengthening the article evaluation system. These efforts have positioned Maskana as a leading journal at the local, regional, national, and international levels.

As a result of these initiatives, in 2025 Maskana was included in Elsevier’s Scopus database, reaffirming the editorial commitment to rigorously evaluating relevant articles. This distinction not only underscores the quality of the publications but also opens new opportunities for authors and researchers, enhancing their visibility and credibility in the academic field. Furthermore, inclusion in Scopus attracts high-quality contributions and allows participation

in bibliometric analyses and impact metrics, facilitating the evaluation of the journal's influence in the scientific community.

In its 15 years, Maskana has achieved significant milestones, publishing 15 volumes, 29 issues, and 255 scientific articles, as well as 11 conference proceedings, with the collaboration of more than 700 authors who have enriched the content with their diverse perspectives and approaches. This collaborative spirit reflects the essence of Maskana, where the search for truth and the advancement of knowledge are fundamental drivers.

As I conclude my tenure as Vice Rector for Research and Innovation at the University of Cuenca and as Director of Maskana, it is an honor and a source of pride to present the current state of the journal. My participation in its growth and academic excellence reflects my firm commitment to science and research, as well as my dedication to promoting an environment of rigorous, high-quality knowledge.

It is essential to express my gratitude to all the authorities at the University of Cuenca for their conviction and support for scientific research over the years. Likewise, I would like to acknowledge the initial work of Jan Feyen, Editor-in-Chief, and Karina Quinde, Editorial Assistant, who laid the foundations for the journal's objectives to become a reality.

Thanks also go to the Research Directors of the University of Cuenca during their different terms: Raúl Vásquez, Jaime Bojorque, and Mauricio Espinoza, for their trust and decision to raise the journal to the highest standards.

My gratitude goes to the editorial teams: Edison Timbe, José Luis Crespo, Estefanía Chuiza, and María Dolores Palacios, for their committed, rigorous, and high-quality work, to Juan José Saenz, IT process analyst, who has been instrumental in improving metadata management for submission to various indexes.

To the authors and reviewers who, over the years, have engaged in dialogue, discussion, and the exchange of experiences and proposals.

Thanks to everyone, Maskana is today a reflection of a scientific community strengthened by research and a space for knowledge generation and academic exploration.

The University of Cuenca is filled with satisfaction as it celebrates fifteen years of contributing to the pursuit of knowledge and dialogue. It is hoped that Maskana will continue to be a space for critical reflection and the search for innovative solutions, thereby advancing knowledge and social welfare and consolidating itself as a platform for internationalization for future generations of researchers.

Impacto del comercio internacional en la relación Colombia-China: un análisis de publicaciones académicas y revisión bibliométrica (2014-2024)

Impact of international trade on the Colombia-China relationship: An analysis of academic publications and bibliometric review (2014-2024)

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Impacto del comercio internacional en la relación entre Colombia y China: Análisis de publicaciones académicas y revisión bibliográfica (2014-2024)

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Resumen

El comercio internacional es fundamental para el desarrollo y la prosperidad de las economías de los países, impulsando su crecimiento y fortaleciendo su posición en el ámbito global. Este estudio analizó las tendencias en la producción investigativa sobre las relaciones y acuerdos de cooperación entre Colombia y China durante el periodo 2014-2024. Se utilizó un enfoque cualitativo mediante una revisión bibliométrica en la base de datos SCOPUS. Se establecieron criterios de exclusión para evitar sesgos, generando una muestra de 69 documentos. Los resultados mostraron un creciente interés en este tema, evidenciado por el aumento en las citas a nivel mundial. Se concluyó que es necesario incrementar la investigación futura sobre el impacto del comercio internacional en el desarrollo de ambas economías.

Palabras clave: revisión bibliométrica, China, Colombia, acuerdos de cooperación, comercio internacional.

Abstract

International trade is essential for the development and prosperity of countries' economies, boosting their growth and strengthening their position in the global arena. This study analyzed trends in research production focused on relations and cooperation agreements between Colombia and China during the period 2014-2024. A qualitative approach was employed through a bibliometric review using the SCOPUS database. Exclusion criteria were established to avoid bias, resulting in a sample of 69 documents. The results revealed a growing interest in this topic, evidenced by an increase in citations worldwide. It was concluded that there is a need to enhance future research on the impact of international trade on the development of both economies.

Keywords: bibliometric review, China, Colombia, cooperation agreements, international trade.

1. Introducción

El comercio internacional desempeña un papel crucial en la integración de las economías y la reducción de las disparidades entre los países desarrollados y en desarrollo. A través de la liberalización del comercio, los países pueden acceder a nuevas tecnologías, conocimientos y oportunidades de inversión, lo que puede mejorar la productividad, diversificar las exportaciones y generar empleo de calidad (Hirschman, 2024). En este contexto, el impacto del comercio internacional en el crecimiento nacional se ha convertido en un tema de gran relevancia en la agenda global. Bustamante et al. (2022) han demostrado que los países que participan activamente en el comercio internacional tienden a experimentar un mayor crecimiento económico a largo plazo. Por lo tanto, es esencial analizar en detalle los efectos positivos y negativos del comercio internacional en las economías para diseñar políticas eficaces que maximicen sus beneficios y minimicen sus riesgos.

En el caso de Colombia, la adopción de un modelo económico expansionista ha dado lugar a avances significativos en diversos sectores, lo que ha dado lugar a la internacionalización de sus industrias, como lo demuestran los resultados de su balanza comercial (González, 2014). Por el contrario, China ha implementado una serie de reformas económicas y acuerdos comerciales que han permitido que su economía se expanda rápidamente. Estas políticas han facilitado la inversión extranjera y promovido la internacionalización de las empresas chinas, lo que ha dado lugar a un aumento significativo de las exportaciones y a una mejora de la balanza comercial del país. Además, la Iniciativa de la Franja y la Ruta, que busca conectar Asia con Europa y más allá, es un claro ejemplo de cómo China está aprovechando el comercio internacional como herramienta para fortalecer su influencia global y promover el desarrollo económico en otros países (Toro y Tijmes, 2020).

Sin embargo, el crecimiento del comercio internacional también plantea retos, especialmente en forma de tensiones comerciales, como las que

han surgido entre China y otros países. Por lo tanto, es fundamental examinar las tendencias de las relaciones comerciales entre Colombia y China para abordar estos retos y maximizar los beneficios del comercio internacional. En este contexto, es esencial comprender que el impacto del comercio internacional no es un factor aislado, sino un sistema que interactúa de manera holística con otros factores exógenos que influyen en el desarrollo de un comercio más justo, equitativo y sostenible.

Para abordar la brecha existente en la bibliografía y examinar la relación matizada entre Colombia y China y su impacto en el comercio internacional, se llevó a cabo un análisis bibliométrico de la literatura científica relacionada con esta relación comercial durante el período 2014-2024. Dada la relevancia de estas revisiones, el análisis puede reforzarse con ideas que ilustren e influyan en el comercio entre estos dos países. La importancia de los estudios bibliométricos radica en su capacidad para identificar tendencias, oportunidades y áreas potenciales de mejora en la relación comercial entre Colombia y China, contribuyendo así al fortalecimiento de las estrategias de comercio internacional de ambos países. Además, estos análisis generan nuevas hipótesis y vías de investigación que mejoran nuestra comprensión de esta relación bilateral. Según Andrés (2009), la importancia de los estudios bibliométricos radica en su aplicabilidad en diferentes disciplinas, lo que permite una producción científica que puede servir de base para la toma de decisiones a nivel gubernamental y empresarial.

A la luz de estas consideraciones, el presente estudio tiene como objetivo explorar hipótesis específicas sobre cómo ha evolucionado la dinámica del comercio internacional entre Colombia y China a lo largo del tiempo. Centrándonos en indicadores clave como la frecuencia de publicación, los patrones de citación y las tendencias temáticas en la literatura entre 2014 y 2024, buscamos descubrir los factores subyacentes que pueden influir en futuras colaboraciones entre estas naciones.

Esta exploración no solo contribuirá al discurso académico, sino que también proporcionará información útil a los responsables políticos que deseen mejorar las relaciones bilaterales mediante estrategias bien fundamentadas. En última instancia, nuestro objetivo es responder a preguntas de investigación fundamentales: ¿Cuál ha sido la evolución de las publicaciones sobre la relación bilateral entre Colombia y China entre 2014 y 2024? ¿Cómo se relacionan estas tendencias bibliométricas con el impacto más amplio del comercio internacional en ambas economías?

Para responder a esta pregunta, se utilizaron los paquetes R Studio y Bibliometrix para analizar y visualizar las tendencias en la producción científica indexada en la base de datos Scopus. Este artículo se organiza en cuatro secciones, sin incluir la introducción. En primer lugar, se presenta en detalle la metodología del estudio, incluidos los métodos, las secuencias y las técnicas utilizadas. A continuación, se presentan los resultados del análisis estadístico, seguidos de las correlaciones y las tendencias. Por último, se ofrecen conclusiones y recomendaciones para futuras investigaciones.

2. Materiales y métodos

Para alcanzar el objetivo de este estudio, se desarrolló un enfoque metodológico basado en criterios de exclusión rigurosos y sistemáticos para el análisis bibliométrico con el fin de identificar las tendencias en la producción científica en el campo del comercio internacional (Donthu et al., 2021). (Véase la tabla 1).

Tabla 1. Criterios de búsqueda
Fuente: Autores (2025)

ELEMENTO	Descripción
Base de datos	Scopus
Período	(2014-2024)
Fecha de consulta	Julio de 2024
Campaña de búsqueda	Título, resumen, palabras clave
Términos de búsqueda	(colombia o colombiano) y (china o chino) y (comercio o negocios)
Entradas	190
Total de entradas	69

Los metadatos utilizados se extrajeron de la base de datos Scopus debido a su amplio alcance, reconocimiento e impacto de la investigación a nivel internacional (Zhu y Liu, 2020).

Scopus es una base de datos multidisciplinar que abarca diversos campos del conocimiento, lo que garantiza la calidad y la relevancia de los metadatos recopilados. Además, su amplia

cobertura de revistas científicas proporciona acceso a una cantidad considerable de información actualizada y de alta calidad, lo que facilita el análisis bibliométrico y la evaluación de la producción científica en diferentes áreas de investigación. Esto permite a los investigadores obtener una visión completa y actualizada del panorama académico en cada área de interés (Zhu y Liu, 2020).

La selección de documentos y la muestra del estudio se llevaron a cabo utilizando los siguientes criterios de exclusión. Para ser considerados, los documentos debían cumplir requisitos específicos: debían estar indexados en la base de datos Scopus, estar comprendidos en el periodo de tiempo comprendido entre 2014 y 2024 y limitarse a campos de búsqueda como Título, Resumen y Palabras clave. Se utilizó la siguiente ecuación de búsqueda en Scopus para identificar información relevante sobre el comercio entre Colombia y China:

**(COLOMBIA OR COLOMBIAN) AND
(CHINA OR CHINESE) AND (TRADE OR
COMMERCE OR BUSINESS)**

Esta ecuación de búsqueda:

Incluye los términos «Colombia» y «China» para centrar la búsqueda en estos países. Añade los

sinónimos «colombiano» y «chino» para captar las variaciones en las referencias a estos países. Incorpora los términos «comercio» y «negocios» para buscar información relacionada con las actividades comerciales entre estos países.

Al ejecutar esta ecuación de búsqueda en Scopus, se obtuvieron resultados que abarcan diversos aspectos del comercio entre Colombia y China, tales como:

- Estudios sobre las relaciones comerciales bilaterales
- Análisis de las tendencias y patrones comerciales
- Investigación sobre oportunidades y retos comerciales
- Artículos sobre políticas y acuerdos comerciales entre los países
- Documentos que examinan el impacto económico del comercio

Los resultados obtenidos mediante esta ecuación de búsqueda proporcionarán una visión general e información actualizada sobre el estado del comercio entre Colombia y China, lo que puede ser útil para comprender mejor esta importante relación económica (Figura 1).

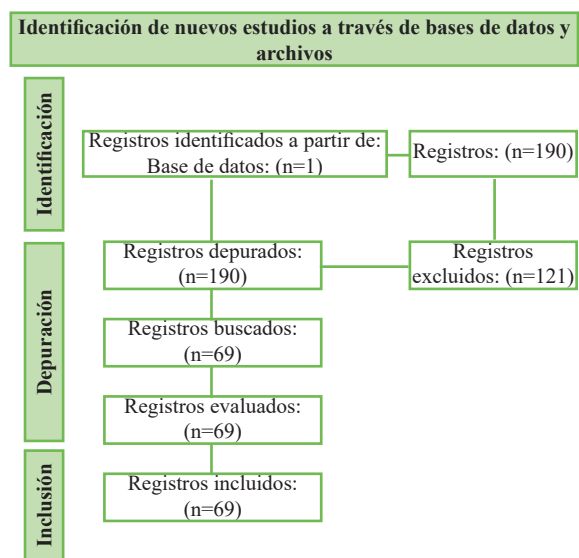


Figura 1. Diagrama de flujo de PRISMA 2020
Fuente. Autores (2025)

La figura 1 ilustra el proceso sistemático utilizado para identificar, examinar y seleccionar los estudios pertinentes para esta revisión. Este diagrama sigue las directrices PRISMA 2020, una norma ampliamente aceptada para la presentación

de informes de revisiones sistemáticas. El diagrama de flujo muestra visualmente cada etapa de la búsqueda bibliográfica, indicando el número de registros encontrados, examinados, excluidos y finalmente incluidos en el análisis.

Inicialmente, se recuperaron un total de 190 registros de múltiples bases de datos académicas. Para centrar la revisión en los estudios más relevantes, se refinó la búsqueda seleccionando áreas temáticas específicas, tales como: Ciencias Sociales, Economía, Econometría y Finanzas, Negocios, Gestión y Contabilidad. Además, solo se incluyeron determinados tipos de documentos: artículos, capítulos de libros, libros y artículos de revisión.

Se aplicaron métodos bibliométricos para garantizar el rigor y la objetividad del proceso de revisión. Estos métodos, tal y como los describen Zupic y Cater (2015), ayudan a evaluar la literatura científica de forma sistemática mediante el análisis de citas y cocitas, lo que reduce los posibles sesgos. El proceso de selección consistió en examinar títulos, resúmenes y palabras clave para excluir los estudios menos pertinentes para el tema de investigación.

Tras aplicar estos criterios, se excluyeron 121 registros, lo que dio como resultado un total final de 69 registros (Tabla 2).

Tabla 2. Tipos de documentos
Fuente: Autores (2025)

Tipo de documento	Cantidad
Artículo	51
Capítulo de libro	11
Libro	5
Artículos de revisión	2
Total	69

Así, tras eliminar los datos duplicados y aplicar los criterios de exclusión, el conjunto de datos final comprende 51 artículos científicos, 11 capítulos de libros, 5 libros y 2 artículos de revisión. Esta variedad refleja la diversidad de tipos de documentos analizados en la revisión. Posteriormente, se llevó a cabo el proceso de lectura para consolidar la muestra del estudio.

El análisis y el procesamiento de los datos de este estudio se llevaron a cabo utilizando el software Bibliometrix, un potente paquete de acceso abierto en R Studio diseñado para la cartografía científica integral (Ahmed et al., 2024). Esta herramienta es esencial para los análisis bibliométricos, ya que emplea códigos de programación que permiten visualizar y analizar de forma eficiente grandes conjuntos de datos. Al aprovechar Bibliometrix, los investigadores pueden identificar tendencias, patrones y relaciones dentro de la literatura científica, lo cual es crucial para la toma de decisiones informadas en la investigación académica. Su creciente relevancia en los contextos académicos y científicos subraya la importancia de evaluar eficazmente la producción y el impacto de la investigación (Aria y Cuccurullo, 2017).

Para mejorar aún más los conocimientos obtenidos del análisis bibliométrico, se realizó un análisis de cocitación y correlación. Este enfoque permite una representación visual de la producción científica relacionada con la relación comercial entre Colombia y China, destacando su impacto en la comunidad académica. Comprender

estas correlaciones es fundamental para seguir la evolución de los campos de investigación e identificar posibles colaboraciones o áreas de investigación emergentes. Estos análisis pueden revelar cómo los estudios interconectados contribuyen a una comprensión más amplia de la dinámica del comercio internacional y orientan las futuras direcciones de investigación.

Además, los resultados de esta revisión bibliométrica coinciden con la literatura actual, que destaca la importancia de las relaciones comerciales para fomentar el crecimiento económico. Por ejemplo, Bustamante Matoma (2024) analiza la calidad percibida de los bienes y servicios chinos en Colombia, ilustrando cómo las percepciones de los consumidores pueden influir en la dinámica comercial. Esta perspectiva es fundamental, ya que añade un nivel de complejidad a la comprensión de las relaciones comerciales, sugiriendo que no solo los factores económicos, sino también las evaluaciones cualitativas, influyen en la configuración de los flujos comerciales bilaterales. Al integrar estas ideas en nuestro análisis, podemos comprender mejor los matices de las relaciones comerciales entre Colombia y China.

3. Resultados

Como resultado de la metodología aplicada, se identificaron tendencias por tipo de publicación, áreas de estudio, países y su factor de impacto en la literatura científica relacionada con el tema objeto de investigación.

Entre los 69 documentos recopilados y seleccionados, se observó un creciente interés en este tema a lo largo de los años, con un predominio de los artículos como tipo de

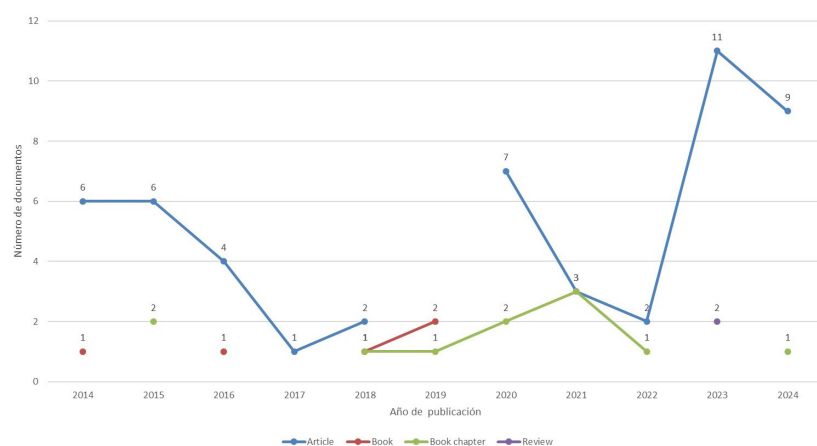


Figure 2. Producción anual
Fuente: Autores (2025)

documento publicado. Desde 2020, se ha producido un aumento significativo del número de publicaciones, lo que sugiere que este tema seguirá atrayendo la atención de la comunidad científica en los próximos años (Figura 2).

En cuanto a los tipos de documentos, la mayor parte de la producción científica consiste en artículos científicos, con un total de 51 publicaciones. Esto representa el 73,9 % del total de documentos, seguido de capítulos de libros con 11 publicaciones (15,9 %). Los libros publicados representan 5 (7,2 %), y los artículos de revisión suman 2 (2,9 %). Esta distribución indica un claro predominio de los artículos en la producción científica sobre el comercio internacional en la relación entre Colombia y China. Esto sugiere que el contexto de esta relación comercial es dinámico, con esfuerzos recientes para fortalecer la cooperación bilateral, como la firma de múltiples acuerdos de cooperación en las áreas económica y comercial.

Sin embargo, el déficit comercial y la necesidad de diversificar las exportaciones colombianas siguen siendo retos persistentes que requieren una investigación continua y la formulación de políticas (Cancillería, 2023). El análisis de la producción científica revela un fuerte énfasis en la publicación de artículos, lo que refleja una tendencia hacia la investigación empírica y el análisis de datos sobre las complejidades del comercio internacional entre Colombia y China. Si bien existe un volumen sustancial de investigación, es fundamental ampliar el alcance del análisis para incluir estudios más completos y estratégicos que puedan orientar el desarrollo futuro de estas relaciones comerciales.

En cuanto a la evolución anual de las publicaciones, entre 2014 y 2019, el número de publicaciones anuales se mantuvo relativamente estable, oscilando entre 3 y 8 documentos por año. Desde 2020, se ha producido un aumento significativo del número de publicaciones, que alcanzó los 13 documentos en 2023, el año con mayor número de publicaciones. Hasta la fecha, en 2024 se han publicado 10 documentos, lo que indica un interés creciente por este tema. El predominio de los artículos sugiere que los investigadores están llevando a cabo estudios

empíricos y análisis de datos sobre el comercio bilateral, lo cual es crucial para comprender la dinámica actual de las relaciones económicas entre Colombia y China. Dada la naturaleza dinámica del comercio internacional, con frecuentes cambios en las políticas, los acuerdos y las condiciones del mercado, es probable que los investigadores publiquen artículos que reflejen estos cambios de manera oportuna.

Esto es especialmente relevante en el contexto de la relación entre Colombia y China, donde las condiciones económicas y políticas están en constante cambio.

Según la información proporcionada en la tabla 3, se detalla la categorización de los documentos en función de su factor de impacto, incluyendo el nombre de la revista, el número de documentos publicados, el idioma, el cuartil y el índice H según el indicador SJR, que registra y evalúa la influencia del total de documentos publicados en una revista (SCImago SJR, 2023).

El índice H refleja un alto nivel de influencia y reconocimiento en la literatura académica relacionada con el comercio internacional y campos afines, ya que mide no solo el número de publicaciones. Este indicador es esencial para comprender cómo ciertos temas, como la relación comercial entre Colombia y China, se establecen y desarrollan dentro de la literatura científica, demostrando la calidad y el impacto del conocimiento generado (Sánchez et al., 2024).

Los datos revelan la clasificación de las revistas con mayor número de publicaciones. En primer lugar se encuentra *Textile Outlook International*, con seis documentos, lo que representa el 8,69 % del total de la muestra. A continuación, cinco revistas tienen dos publicaciones cada una: *Global Policy*, *Journal of Chinese Economic and Foreign Trade Studies*, *Journal of Cleaner Production*, *The Global Coal Market Supplying the Major Fuel for Emerging Economies* y *World Regional Studies*. Esto indica una falta de dominio entre las revistas líderes en cuanto al número de publicaciones en el campo de investigación analizado. Esta diversidad de fuentes proporciona una perspectiva amplia y variada sobre los temas tratados en la literatura científica.

Tabla 3. Factor de impacto
Fuente: Autores (2025)

Revista	Número de documentos	Cuartil (SJR)	Índice H (SJR)	Idioma
Textile Outlook International	6	4.º trimestre	8	Inglés
Política global	2	Q1	47	Inglés
Revista de Estudios Económicos y de Comercio Exterior de China	2	Q2	18	Inglés
Revista de producción más limpia	2	Q1	309	Inglés
El mercado mundial del carbón suministra el principal combustible a las economías emergentes	2	Not yet assigned quartile	14	Español
Estudios regionales mundialesH	2	Cuartil aún sin asigna	3	Chino

En cuanto a la distribución lingüística en la muestra de 69 documentos, el inglés es el idioma predominante, con un total de 55 publicaciones (79,71 %). Le sigue el español, con 10 documentos (14,49 %), mientras que tanto el chino mandarín como el ruso tienen 2 publicaciones cada uno (2,89 %).

Este análisis pone de relieve la importancia de tener en cuenta la diversidad lingüística en la producción de documentos y las oportunidades de mejorar la representación de diferentes idiomas en la literatura académica y profesional. La elevada proporción de documentos en inglés sugiere que el contenido está dirigido a un público global, lo que facilita su difusión y accesibilidad.

Sin embargo, la limitada representación de otros idiomas puede indicar una falta de diversidad en la producción de documentos. Esto supone una oportunidad para fomentar la inclusión de más idiomas en futuras investigaciones y publicaciones, enriqueciendo así el panorama académico y cultural y permitiendo compartir internacionalmente una gama más amplia de perspectivas y conocimientos.

En consecuencia, la distribución de los cuartiles de las revistas permite evaluar sus posiciones relativas dentro del campo. *Global Policy y Journal of Cleaner Production* se distinguen en el primer cuartil, lo que indica su gran impacto, mientras que *Textile Outlook International* se encuentra en el cuarto cuartil, lo que sugiere un menor nivel de reconocimiento.

Por el contrario, el estudio de Cantillo et al. (2022) destacó que las tendencias en la investigación empresarial internacional muestran un predominio lingüístico, así como la importancia de la internacionalización empresarial para entrar en los mercados emergentes.

En el caso de la coocurrencia (interrelación de términos), la figura 3 presenta un análisis jerárquico de los temas relacionados con el algodón y el comercio internacional. Los principales temas identificados en la bibliografía incluyen el algodón crudo, el comercio internacional y el comercio en general. La rama principal hace hincapié en el algodón crudo y sus subtemas asociados, como las fábricas, Bangladesh, los factores de producción, los tejidos de algodón y Hong Kong. Este enfoque refleja la importancia de la producción y la fabricación de algodón crudo dentro de la industria textil mundial.

Por el contrario, el comercio internacional y el comercio abarcan subtemas críticos dentro de la literatura científica relacionada con el comercio internacional basado en las relaciones bilaterales entre Colombia y China. Estos subtemas incluyen la producción textil, la fabricación de calzado, las ventas minoristas y las presiones inflacionarias. Estos temas subrayan la importancia del comercio mundial y la interconexión de los mercados internacionales. Este análisis jerárquico sugiere que estos temas se encuentran entre los más investigados debido a su relevancia económica. La importancia del algodón crudo como una de las principales importaciones de Colombia se ve corroborada por su papel sustancial en la economía y la industria textil colombianas.

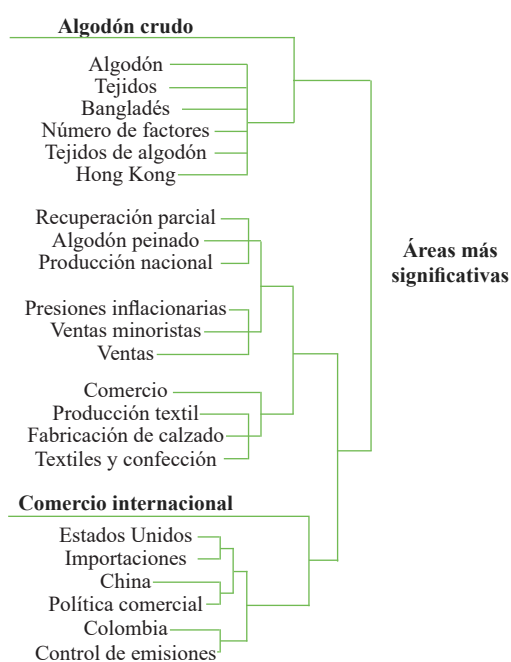


Figura 3. Áreas más significativas
Fuente: Autores (2025)

Esta observación respalda la afirmación de Mateus y Rojas (2015), quienes indican que China es un importante proveedor de productos textiles a Colombia, incluidos los tejidos de algodón. Destacan que Colombia importa tejidos de algodón con un contenido superior al 85 % en peso, lo que demuestra la dependencia del país de los productos textiles chinos. La relación comercial entre Colombia y China se ha fortalecido en los últimos años, con esfuerzos por diversificar las exportaciones colombianas al mercado asiático, con el objetivo de lograr un desarrollo competitivo de las pequeñas y medianas empresas. No obstante, la atención se ha centrado más en las materias primas que en los productos agrícolas como el algodón. Además, los acuerdos de cooperación entre ambos países buscan aumentar los intercambios comerciales y facilitar la entrada de productos colombianos en el mercado chino (Piñeiro et al., 2017a).

El análisis jerárquico de los temas relacionados con el algodón y el comercio internacional revela una compleja red de factores interconectados que influyen en la industria mundial del algodón. El algodón en bruto surge como un tema central, ya que su producción y comercio están estrechamente vinculados a diversos factores económicos y geográficos. La prominencia

de Bangladesh y Hong Kong en este análisis subraya la importancia de los países asiáticos en la red mundial de comercio del algodón. Estas naciones se han convertido en actores clave en las industrias textil y de la confección, y dependen en gran medida de las importaciones de algodón para impulsar sus sectores manufactureros. La inclusión de las fábricas y los factores de producción en la jerarquía pone de relieve la importancia de la capacidad industrial y la asignación de recursos en la configuración del panorama del comercio del algodón (Chen y Zhao, 2023a).

La interrelación entre el comercio del algodón y factores económicos más amplios es evidente en el análisis. El comercio internacional y el comercio en general están estrechamente relacionados con el algodón en bruto, lo que refleja el papel crucial de este producto básico en el comercio mundial. Esta conexión pone de relieve la necesidad de que los responsables políticos tengan en cuenta las intrincadas relaciones entre las políticas comerciales, el crecimiento económico y la industria del algodón a la hora de formular acuerdos internacionales (Guzmán y Stiglitz, 2024a). Además, la presencia de los tejidos de algodón en la jerarquía sugiere que los productos de valor añadido derivados del algodón crudo también desempeñan un papel importante en el comercio internacional. Este aspecto del análisis subraya la importancia de tener en cuenta tanto las materias primas como los productos acabados al examinar el comercio mundial del algodón, así como el potencial de los países para ascender en la cadena de valor de la industria textil (Xie et al., 2023a).

El análisis del comercio bilateral entre Colombia y China en el sector textil revela un enfoque predominante en la exportación de materias primas, especialmente algodón, lo que limita una comprensión integral de la dinámica industrial. Sin embargo, la industria textil colombiana ha realizado importantes esfuerzos para expandir los mercados, abarcando no solo las materias primas, sino también los sectores de teñido, diseño y procesos de fabricación de prendas de vestir que añaden valor y mejoran la competitividad internacional (Piñeiro, et al., 2017b).

Esta perspectiva más amplia es crucial para comprender la compleja red de producción y comercio que involucra a ambos países, donde la dependencia del algodón crudo coexiste con la creciente importancia de los productos textiles terminados y los procesos industriales avanzados (Chen y Zhao, 2023b).

Además, la literatura científica reciente destaca la interrelación entre la producción de algodón y el comercio internacional, señalando que países asiáticos como China, Bangladesh y Hong Kong desempeñan un papel central en la fabricación y comercialización de productos textiles, desde las materias primas hasta los productos con valor añadido (Xie et al., 2023b).

En este contexto, la relación comercial entre Colombia y China no se limita a las importaciones de algodón, sino que también incluye tejidos y prendas de vestir, lo que refleja un marco económico que debe abordarse desde una perspectiva integrada para fortalecer la competitividad colombiana en toda la cadena de valor textil (Mateus y Rojas, 2015). Por lo tanto, incorporar el análisis de los tejidos, el diseño y la fabricación de prendas de vestir en futuras investigaciones permitirá comprender mejor las oportunidades y los retos de la diversificación

y el desarrollo del sector textil colombiano en relación con el mercado chino (Guzmán y Stiglitz, 2024b).

La figura 4 presenta un diagrama de red que ilustra las relaciones entre países, autores y temas de investigación en el ámbito del comercio internacional y cuestiones económicas relacionadas. El diagrama destaca que algunos países muestran una participación significativa en este campo de investigación. China y Estados Unidos se perfilan como los principales contribuyentes, lo que refleja su gran interés y necesidad de comprender mejor la dinámica del comercio internacional, los riesgos geopolíticos y los mercados emergentes. Estos países, junto con Suiza y el Reino Unido, destacan en la producción de estudios en estas áreas, lo que subraya su influyente papel en la economía mundial.

Los principales temas de investigación identificados incluyen el comercio internacional, el riesgo geopolítico y los mercados emergentes. Estas áreas son fundamentales tanto para las economías desarrolladas como para las economías en desarrollo, ya que permiten comprender y anticipar las fluctuaciones económicas mundiales, las oportunidades de crecimiento y los retos geopolíticos. La presencia de autores de diversas

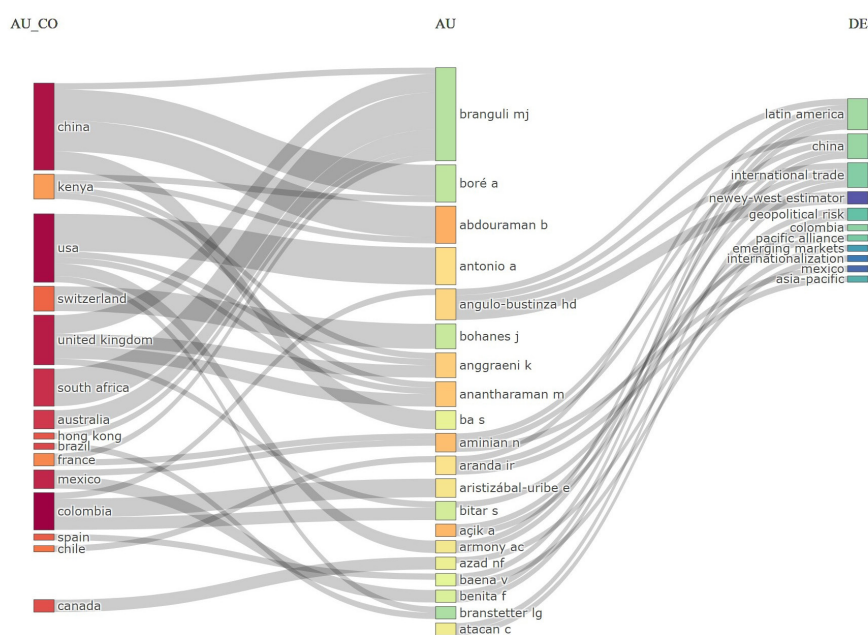


Figura 4. Correlación de la producción entre autor, país y palabras clave
Fuente: Autores (2025)

nacionalidades indica una fuerte colaboración internacional, lo cual es crucial para abordar cuestiones económicas y geopolíticas complejas que traspasan las fronteras nacionales. Esta cooperación internacional también sugiere que los resultados de la investigación son relevantes y aplicables a una amplia gama de contextos económicos y geográficos.

La interconexión entre los países y los temas de investigación implica una causalidad subyacente: las naciones económicamente sólidas y emergentes invierten significativamente en la investigación de estos temas para asegurarse ventajas estratégicas. En consecuencia, el enfoque en el comercio internacional y los mercados emergentes refleja una preocupación por las oportunidades de crecimiento económico en diferentes regiones, mientras que la atención al riesgo geopolítico pone de relieve el interés por la estabilidad económica y la seguridad nacional. Investigaciones como la de Shoujun y Cepik (2022) exploran la política exterior de China en el contexto de América Latina, ilustrando cómo China busca extender su influencia en la región a través de acuerdos comerciales y de cooperación. Estos estudios enfatizan la importancia de comprender la dinámica geopolítica en el ámbito económico para anticipar escenarios futuros y tomar decisiones estratégicas informadas.

El análisis subraya la necesidad de modernizar y profundizar los marcos de integración comercial, teniendo en cuenta los riesgos geopolíticos

y económicos. Revela cómo las principales potencias económicas aprovechan su influencia para establecer acuerdos comerciales que favorecen sus intereses, lo que puede afectar al desarrollo de los países emergentes. Además, la investigación explora posibles soluciones y estrategias para equilibrar los déficits comerciales y promover un desarrollo global más equitativo.

La figura 5 presenta un análisis de las citas, que revela un patrón fluctuante de interés en el comercio internacional entre Colombia y China. Los datos indican que, aunque ha habido picos de interés, especialmente en años críticos como 2015, con 67 citas, y 2020, con 58 citas, hay una media de 25,27 citas al año. Sin embargo, la tendencia general parece estar disminuyendo en los últimos años, de 2021 a 2024.

Estudios como los de Aranibar-Ramos y Quispe-Ambrocio (2023) hacen hincapié en que el comercio internacional y los intercambios transfronterizos son esenciales para la prosperidad económica. No obstante, en los últimos años se han observado lagunas en el interés temático y la producción, lo que sugiere la necesidad de revitalizar la atención en este ámbito para fomentar una comprensión más profunda de la dinámica comercial entre ambos países.

La variabilidad en el número de citas sugiere que el interés por el comercio internacional y las relaciones entre Colombia y China se ha visto influido por diversos factores, entre ellos

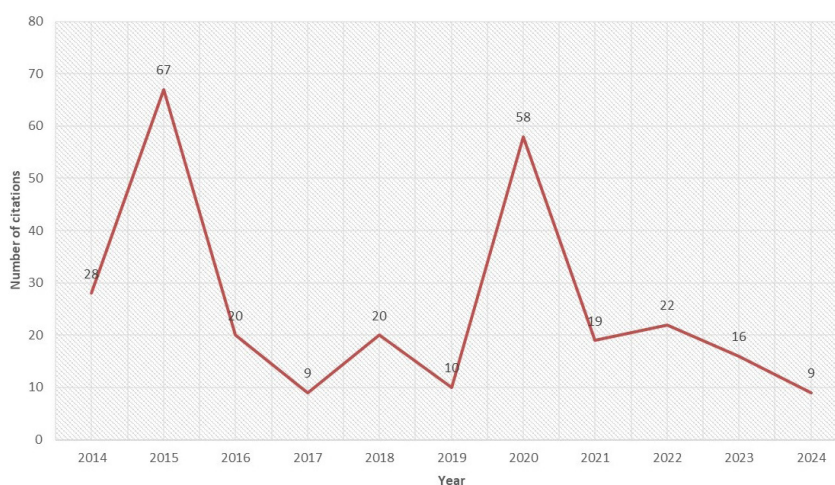


Figura 5. Tendencias globales de citas de los documentos más citados
Fuente: Autores (2025)

los cambios económicos, los cambios políticos y los acontecimientos mundiales (Bustamante y Vargas, 2024).

Por lo tanto, estas fluctuaciones pueden reflejar la necesidad de una exploración más profunda de las relaciones económicas con China y de una alineación más eficaz con las tendencias y oportunidades comerciales emergentes en el mercado chino, adaptándose a las necesidades de productividad, competitividad e inversión (Quan, 2024).

En el contexto del análisis bibliométrico de las relaciones comerciales entre Colombia y China de 2014 a 2024, los resultados revelaron varias tendencias significativas. El estudio identificó un aumento constante en el número de publicaciones sobre este tema a lo largo de la década, con un notable aumento en la producción de investigaciones a partir de 2018. Este crecimiento del interés académico coincidió con importantes acontecimientos económicos y políticos entre los dos países, como la implementación de nuevos acuerdos comerciales y el aumento de la inversión de China en proyectos de infraestructura colombianos.

El análisis también reveló patrones en las áreas de interés de la investigación. Las primeras publicaciones se centraban principalmente en métricas comerciales tradicionales e indicadores económicos. Sin embargo, a medida que evolucionaba la relación entre Colombia y China, también lo hacían los temas de investigación. Los estudios más recientes mostraron una diversificación de los temas, incluyendo el impacto medioambiental del comercio, las influencias del intercambio cultural y el papel de la tecnología en la facilitación del comercio bilateral. Este cambio refleja la creciente complejidad y la naturaleza multifacética de la relación comercial entre Colombia y China.

Por esa razón, el análisis de la relación comercial entre Colombia y China debe ir más allá de la exportación de materias primas como el algodón para incluir también los productos manufacturados y los servicios, dado que el

comercio bilateral abarca una amplia gama de productos. Tradicionalmente, Colombia ha exportado productos mineros y energéticos como petróleo, carbón y ferroníquel, junto con productos agroindustriales como el aguacate Hass, pero también productos manufacturados como textiles, productos químicos y productos procesados que añaden valor a la oferta de exportación (Anal dex, 2025). Esta diversificación es clave para fortalecer la competitividad de Colombia en el mercado chino y reducir la asimetría en la balanza comercial, que actualmente muestra un déficit significativo para Colombia.

Además, la incorporación de los productos manufacturados en el análisis permite comprender mejor la dinámica comercial y los retos a los que se enfrentan los sectores industriales colombianos ante la competencia china. La adhesión de Colombia a la Iniciativa de la Franja y la Ruta abre oportunidades para aumentar las exportaciones de productos manufacturados, mejorar la infraestructura y facilitar la entrada de productos de mayor valor agregado en el mercado asiático. En este sentido, es esencial que las futuras investigaciones y políticas comerciales tengan en cuenta la variedad de productos exportados, incluidas las materias primas, los productos manufacturados y los servicios, a fin de diseñar estrategias e iniciativas integrales que promuevan una relación comercial más equilibrada y sostenible (Bustamante y Vargas, 2024).

Según Quan (2024), la limitada relación económica entre Colombia y China se debe principalmente a la baja competitividad de Colombia en los sectores de productos básicos, lo que ha dado lugar a menores exportaciones e inversiones chinas en comparación con otros países latinoamericanos. Esta situación ha reducido los incentivos para que Colombia firme acuerdos económicos con China y ha mantenido una percepción pública más favorable hacia los Estados Unidos.

La incorporación de las ideas de Arias-Amaguaña et al. (2022) complementa el debate sobre la dinámica comercial de Colombia al destacar el papel del emprendimiento social y los modelos cooperativos como vías alternativas para el

Tabla 4. Principales partidas y subpartidas arancelarias de los productos exportados de Colombia a China (2014-2024).
Fuente: Autores (2025)

Partida arancelaria	Subpartida arancelaria	Descripción del producto	Valor aproximado de exportación (USD millones)	Comentarios
27	2709.00.00	Petróleo crudo	1,200 - 2,500	Principal producto minero y energético exportado
26	2601.11.00	Mineral de hierro y concentrados	500 - 800	Exportaciones minerales significativas
08	0804.50.00	Hass aguacate	150 - 300	Producto agroindustrial en crecimiento
52	5201.00.00	Algodón crudo	50 - 120	Materia prima para la industria textil
61	6109.10.00	Prendas de punto (manufacturas)	40 - 90	Productos textiles manufacturados con valor añadido
29	2933.29.00	Productos químicos orgánicos	30 - 70	Industria química para procesos de teñido y textiles
72	7208.90.00	Productos laminados planos de hierro o acero	20 - 60	Productos metálicos para la construcción y la maquinaria
84	8407.21.00	Motores diésel y sus partes	15 - 40	Maquinaria y equipo industrial

desarrollo sostenible y el crecimiento económico equitativo. Si bien la adhesión de Colombia a la Iniciativa de la Franja y la Ruta ofrece oportunidades para ampliar las exportaciones de productos manufacturados y la infraestructura,

abordar los retos estructurales, como la baja competitividad y los desequilibrios comerciales, requiere estrategias inclusivas que empoderen a las comunidades locales y promuevan la innovación social.

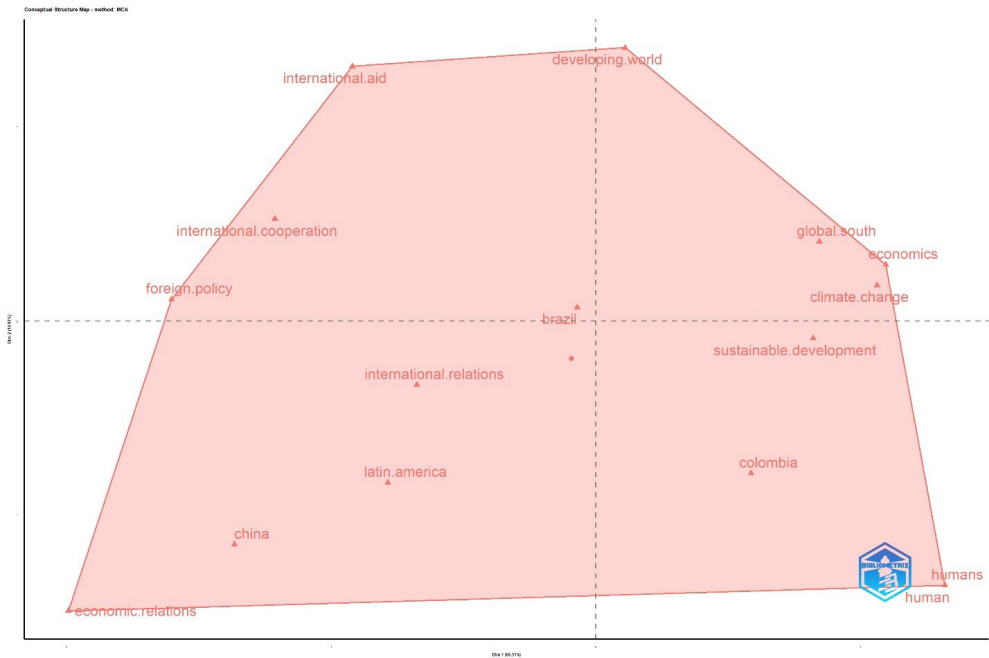


Figura 6. Mapa conceptual de la estructura de la literatura académica
Fuente: Authors (2025)

La figura 6 corresponde a un mapa conceptual generado mediante un análisis factorial múltiple (MCA), que permite visualizar la organización temática y las relaciones entre los conceptos clave de la literatura académica sobre las relaciones bilaterales entre Colombia y China. Además, la figura 6 muestra que los conceptos se agrupan y distribuyen en el espacio según su coocurrencia en los documentos analizados, revelando patrones de asociación y posibles agrupaciones temáticas. Por ejemplo, términos como «cooperación internacional», «política exterior» y «ayuda internacional» se agrupan en el cuadrante superior izquierdo, lo que sugiere que estos temas suelen abordarse conjuntamente en los estudios sobre cooperación internacional. Por el contrario, conceptos como «cambio climático», «economía» y «sur global» aparecen más a la derecha, lo que indica un enfoque temático vinculado al desarrollo sostenible, los retos económicos y el contexto del sur global.

En la parte inferior del mapa, palabras como «China», «América Latina» y «relaciones económicas» se sitúan cerca unas de otras, lo que pone de manifiesto la centralidad de las relaciones económicas y políticas entre China y América Latina en la bibliografía revisada. La presencia destacada de «Colombia» junto a «desarrollo sostenible» y «cambio climático» sugiere que los estudios recientes han comenzado a vincular la agenda medioambiental y de sostenibilidad con las relaciones bilaterales y multilaterales de Colombia en el marco latinoamericano. Además, la inclusión de términos como «seres humanos» y «humano» puede indicar una tendencia creciente a considerar las dimensiones sociales y humanas en el análisis de estos fenómenos.

Por otra parte, la bibliografía indica que la relación entre China y América Latina ha evolucionado hacia una agenda más amplia que incluye no solo los flujos comerciales, sino también la cooperación científica, tecnológica y en materia

de políticas públicas para hacer frente a los retos globales (CEPAL, 2025).

Por otra parte, el análisis bibliométrico del impacto del comercio internacional en la relación entre Colombia y China evidencia la necesidad de fortalecer la capacidad de adaptación estratégica de las organizaciones colombianas para enfrentar un entorno global dinámico y competitivo. Según Sadraei et al. (2023), el desarrollo de capacidades dinámicas es fundamental para que las empresas y las economías respondan eficazmente a los cambios internacionales, lo que se traduce en la importancia de diversificar los productos y los mercados, así como de fomentar la innovación y la flexibilidad institucional.

Esta perspectiva es clave para comprender cómo Colombia puede mejorar su posición en la relación bilateral, especialmente ante la creciente presencia y competencia de las empresas chinas en sectores estratégicos como la energía, la manufactura y las telecomunicaciones. Además, la incertidumbre de la política económica representa un desafío adicional para la consolidación de esta relación comercial. Mir et. al. (2025) señalan que la volatilidad de las políticas afecta a decisiones empresariales críticas, como la gestión de inventarios y la planificación empresarial, lo que limita la capacidad de las empresas colombianas para aprovechar al máximo las oportunidades que ofrece el mercado chino.

Por último, la logística internacional desempeña un papel determinante en la competitividad del comercio entre Colombia y China. Galán Jurado et al. (2023) señalan que la eficiencia en las operaciones logísticas y la gestión de la cadena de suministro son factores esenciales que condicionan la entrada y la permanencia de los productos colombianos en el mercado chino, así como la importación de productos chinos a Colombia.

4. Conclusiones

La investigación sobre el impacto de la relación entre Colombia y China, realizada mediante una revisión científica bibliométrica y un análisis de tendencias, ha revelado un creciente interés por los beneficios de la inversión y la cooperación internacional entre ambos países. Esto pone de relieve la relevancia internacional de la producción científica para comprender las realidades y los retos a los que se enfrentan estas relaciones bilaterales.

Sin embargo, la baja proporción de capítulos de libros y artículos de revisión sugiere una posible falta de análisis contextuales más profundos que podrían proporcionar una perspectiva más amplia sobre las implicaciones de estas relaciones comerciales. Esto supone una oportunidad para que futuras investigaciones exploren temas como el contexto histórico de las relaciones comerciales, las políticas de inversión y estudios de casos específicos.

Las principales conclusiones indican que la investigación sobre el comercio internacional entre Colombia y China es significativa y tiene un gran impacto. Las tendencias de citas, aunque fluctuantes, muestran períodos de mayor interés que coinciden con acontecimientos importantes en las relaciones comerciales. Además, la calidad de las revistas en las que se publican estos estudios, según indica el índice H, sugiere que los artículos de revistas de gran impacto son más propensos a ser citados. Esto subraya la importancia de la calidad de las publicaciones para la difusión del conocimiento en este campo.

Para la toma de decisiones sobre la internacionalización de las industrias, el estudio proporciona información y tendencias valiosas, ofreciendo una visión de áreas de gran interés, como el algodón en bruto y el comercio internacional. Las conclusiones sugieren que los investigadores y los responsables políticos deben abordar las complejidades del comercio internacional entre Colombia y China. Se necesita un enfoque más estratégico y global, que se centre no solo en la producción de materias primas,

sino también en la promoción de productos de mayor valor añadido y la diversificación de los mercados.

Por último, las limitaciones del estudio sugieren la necesidad de ampliar la búsqueda a diversas bases de datos para obtener una muestra más amplia de la producción científica. Esto contribuiría a una comprensión más completa del comercio entre estas dos naciones. La presente investigación sirve de base para futuros estudios, que deberían explorar más a fondo la relación comercial bilateral y sus posibles repercusiones en el desarrollo económico y social de ambos países.

En conclusión, esta investigación sirve como un paso fundamental para comprender la intrincada dinámica de las relaciones comerciales entre Colombia y China. Hace hincapié en la necesidad de investigar más a fondo diversos aspectos que influyen en estos lazos bilaterales. Los estudios futuros deberían tener como objetivo incorporar metodologías diversas y conjuntos de datos más amplios para enriquecer el conjunto de conocimientos existentes. De este modo, los investigadores podrán informar mejor a los responsables políticos sobre estrategias eficaces para fomentar el crecimiento económico sostenible mediante una mayor cooperación.

En última instancia, este análisis bibliométrico no solo arroja luz sobre las tendencias actuales, sino que también destaca las áreas que requieren una mayor investigación. A medida que la globalización sigue configurando las interacciones económicas en todo el mundo, comprender los matices de relaciones bilaterales específicas, como la que existe entre Colombia y China, será crucial para desarrollar políticas informadas que promuevan el crecimiento equitativo y los beneficios mutuos. Las implicaciones de este estudio van más allá del discurso académico; proporcionan información útil para las partes interesadas que participan en el comercio internacional y las estrategias de inversión entre estas dos naciones.

5. Recomendaciones

Si bien los resultados de este estudio proporcionan información valiosa sobre la relación comercial entre Colombia y China, hay varias recomendaciones que pueden mejorar los futuros esfuerzos de investigación en este ámbito. En primer lugar, se anima a los investigadores a adoptar un enfoque multidisciplinar que incorpore perspectivas de la economía, la sociología y las ciencias políticas. Esta perspectiva más amplia puede facilitar una comprensión más completa de las complejidades que rodean la dinámica del comercio internacional y sus implicaciones socioeconómicas. Mediante la integración de diversas metodologías, como estudios de casos cualitativos junto con análisis bibliométricos cuantitativos, los académicos pueden descubrir conocimientos más profundos sobre cómo los factores culturales e institucionales influyen en las relaciones comerciales.

Este estudio tiene ciertas limitaciones debido a que se basa exclusivamente en la base de datos Scopus como única fuente de información, lo que puede restringir la amplitud y diversidad de la bibliografía revisada. La estrategia de búsqueda se centró en términos específicos relacionados con Colombia, China y el comercio, pero no incluyó expresiones adicionales relevantes que

podrían haber ampliado el alcance. Además, la selección de documentos se limitó a los campos del título, el resumen y las palabras clave, lo que podría excluir estudios pertinentes que no mencionan explícitamente estos términos en esas secciones.

Además, se recomienda que los estudios futuros amplíen su alcance incluyendo una gama más amplia de fuentes de datos más allá de la base de datos Scopus. La incorporación de bases de datos adicionales podría proporcionar una muestra más representativa de la producción científica relacionada con las relaciones comerciales entre Colombia y China. Este conjunto de datos ampliado permitiría un análisis más sólido de las tendencias y correlaciones, lo que en última instancia contribuiría a una comprensión más rica de la relación bilateral. Además, los investigadores deberían considerar la posibilidad de explorar el impacto de los nuevos retos globales. Abordar estas cuestiones contemporáneas no solo mejorará el discurso académico, sino que también proporcionará a los responsables políticos información relevante para navegar eficazmente por el cambiante panorama del comercio internacional.

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Psychometric Properties of the Zung Self-Applied Anxiety Scale

Propiedades psicométricas de la Escala Autoaplicada de Zung para Ansiedad

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Psychometric Properties of the Zung Self-Applied Anxiety Scale

Propiedades psicométricas de la Escala Autoaplicada de Zung para Ansiedad

Abstract

The Zung Anxiety Scale, originally known as the Self-Rating Depression Scale (SDS) and developed by Zung in 1965, was designed in 1971. In the following study, the psychometric properties of the Zung Self-Applied Anxiety Scale were evaluated in health care personnel in Ecuador. A total of 1104 individuals participated, all employed in public health services in the province of Azuay. The sample included nurses, physicians, nursing assistants, administrative staff, administrative assistants, and other areas (age range ranged from 22 to 66 years, $\bar{x} = 38.3$ years and $\sigma = 9$). In analyzing the literature, 7 models were found and evaluated for the factor structure of the scale by exploratory analysis and confirmatory analysis. When examining the goodness-of-fit, the best-fitting model presented a trifactorial structure.

Keywords: psychometric properties, factorial validity, Zung anxiety scale, health personnel, Ecuador

Resumen

La Escala de Ansiedad de Zung, originalmente conocida como Self-Rating Depression Scale (SDS) y desarrollada por Zung en 1965, fue diseñada en 1971. En el siguiente estudio, se evaluaron las propiedades psicométricas de la Escala Autoaplicada de Zung para Ansiedad en el personal sanitario de Ecuador. Participaron 1104 individuos, todos empleados en los servicios de salud pública de la provincia del Azuay. La muestra incluyó enfermeros, médicos, auxiliares de enfermería, personal administrativo, auxiliares administrativos, y otras áreas (el rango de edad osciló entre 22 y 66 años, $\bar{x} = 38.3$ años y $\sigma = 9$). Al analizar la literatura, se encontraron 7 modelos que fueron evaluados para la estructura factorial de la escala mediante análisis exploratorio y análisis confirmatorio. Al examinar la bondad de ajuste, el modelo más adecuado presentó una estructura trifactorial.

Palabras clave: propiedades psicométricas, validez factorial, escala de ansiedad de Zung, personal sanitario, Ecuador

1. Introduction

Anxiety, characterized by a diffuse feeling of apprehension or worry, varies in intensity and can significantly affect daily life. Often, the distinction between anxiety and fear is blurred, allowing the two terms to be used interchangeably to describe psychophysiological responses to adverse situations. While fear is triggered by definite and present threats, anxiety arises in diffuse or unknown contexts. This complex interrelationship has been studied by cognitive theorists and has recently been addressed by learning theories, which recognize the importance of emotional language in human behavior (Smith, 2020).

The World Health Organization (WHO, 2019) has defined mental health as a state of well-being in which an individual can make use of their own abilities, cope with the everyday stresses of life, work productively, and contribute effectively to their community. Mental health is therefore recognized as a fundamental pillar of the overall well-being of society as a whole. Through this framework, the importance of understanding and addressing anxiety as a critical component of mental health is highlighted, with significant implications for the quality of life and daily functioning of individuals.

Healthcare workers, due to the nature of their work, are exposed to a variety of occupational risk factors that can trigger high levels of anxiety. These factors include the content of the work, the level of responsibility involved, direct and continuous contact with patients, high workloads, irregular schedules, the possibility of encountering violent situations, the physical environment in which they work, the organizational structure in which they are integrated, and the lack of social recognition for their work. Together, these factors create an environment conducive to the development of high levels of anxiety in this professional group, which could have significant repercussions at both the individual and collective levels (García-Morán and Gil-Lacruz, 2016).

The Zung Anxiety Scale, known initially as the Self-Rating Depression Scale (SDS), was developed by William Zung in 1965 and explicitly adapted to assess anxiety in 1971. Published in English and later translated into Spanish, this empirical tool has been widely used to quantify anxiety symptoms in various populations (Jiménez et al., 2021). However, despite its widespread use, the applicability and validity of this tool in specific geographical and cultural contexts, such as Ecuador, have not been thoroughly evaluated. This research aims to address the gap in the psychometric properties of the Zung Anxiety Scale, a widely used scale in various fields, by evaluating its properties among Ecuadorian healthcare personnel. Through a detailed analysis of the psychometric properties of the scale in this specific setting, we seek to provide a deeper understanding of its usefulness and reliability in assessing anxiety in this particular population, which is heterogeneous in terms of profession, educational level, and sociocultural and economic differences. This will contribute significantly to the existing body of knowledge on mental health.

Thus, the purpose of this study is to broaden the existing understanding of anxiety and its specific assessment in healthcare professionals in Ecuador. By providing a detailed analysis of the factorial configuration of the Zung Anxiety Scale, the reliability of its dimensions, and its assessment with sociodemographic variables, we aim to obtain a clear and accurate picture of the current situation in the country. The findings derived from this research could have significant implications for the formulation of promotion and prevention programs related to mental health and well-being. In addition, they could lay the foundation for future research and intervention strategies in the workplace, focused on maintaining the mental health and well-being of healthcare workers in Ecuador.

It is also essential to consider that the validation of psychometric instruments must take into

the sociocultural context in which they are applied. The Zung Self-Rating Scale was developed in a different cultural environment. Although it has been widely used in Spanish-speaking contexts, its psychometric properties may vary significantly depending on cultural, linguistic, and contextual factors specific to each country. In the case of Ecuador, aspects such as the particularities of the health system, regional differences, language practices, and local ways of expressing emotional distress can influence how items are understood and interpreted. Therefore, validating this scale in the Ecuadorian population not only allows its relevance and reliability to be ensured but also guarantees a more accurate assessment of anxiety symptoms, strengthening the basis for interventions tailored to the national reality.

From the multiple theoretical perspectives that have studied the phenomenon of anxiety, Beck and Emery (1985), based on cognitive theory, propose that anxiety arises from distorted interpretations of events and situations, resulting in a disproportionate emotional response. This approach highlights the importance of cognitive processes in the manifestation and maintenance of anxiety in clinical and non-clinical contexts.

On the other hand, learning theories have explored anxiety from a behavioral perspective, highlighting the importance of conditioning and the acquisition of emotional responses to specific stimuli (Lang, 1984; Lazarus, 1991). These theories have demonstrated how repeated exposure to aversive stimuli can lead to conditioned anxious responses, emphasizing the relevance of context in the generation and maintenance of anxiety.

In the field of occupational health, anxiety has been recognized as a factor that significantly affects the mental health and well-being of professionals. According to Piqueras Rodríguez et al. (2008), factors such as high workload and working conditions can influence the onset and maintenance of anxiety and stress problems, which directly affect individuals' habits and behaviors, as well as their psychophysiological balance.

In addition, the theoretical framework of anxiety has evolved to integrate concepts of mental health and occupational well-being. In particular, the World Health Organization has emphasized the importance of mental health in the workplace and highlighted the need for effective interventions to address stress and anxiety among workers (WHO, 2019). This perspective has led to greater attention being paid to the assessment and management of anxiety in the workplace, particularly among healthcare professionals.

The Zung Anxiety Scale, originally called the Self-Rating Depression Scale, or SDS, was developed by Zung in 1965 and finally designed in 1971. It was initially published in English and then translated into Spanish. It is an empirically based scale for quantifying anxiety symptoms, with good reliability indices (0.70-0.80) in the two-halves reliability test and a Cronbach's alpha coefficient between .79 and .92. It consists of 20 items related to the presence of anxiety. The response options are considered scales in which the participant selects their response from: never, often, almost always, and always (Jiménez et al., 2021).

Based on the study by Olatunji et al. (2006), a factor analysis was carried out using a sample of 552 individuals in order to investigate the dimensionality of somatic complaints and evaluate the psychometric structure of the Anxiety Self-Assessment Scale. An exploratory factor analysis was performed using oblique rotation techniques (oblimin) to identify the underlying dimensions. The four-factor analysis revealed a clearly defined structure, in which item 10 was excluded due to its association with factors 1 and 2. The factors identified were designated as follows: Factor 1 is labeled "Anxiety and panic," Factor 2 as "Vestibular sensations," Factor 3 as "Somatic control," and Factor 4 as "Gastrointestinal or muscular sensations." These findings highlight the multidimensionality of anxiety and suggest the importance of considering a variety of somatic symptoms when assessing anxiety in clinical and research settings.

In the study conducted by Hernández-Pozo et al. (2008) at the National Autonomous University of Mexico, the psychometric properties of the Zung

State Anxiety Inventory were examined in a sample of 443 individuals. Factor analysis, using oblimin rotation, was conducted to investigate the underlying structure of the instrument and revealed the presence of four distinct factors, consistent with the results obtained in the previous study. However, item 19 was excluded due to its presence in factors 2 and 4.

Subsequently, using a larger sample of 920 individuals, an additional factor analysis with varimax rotation was performed. During this analysis, item 12 was eliminated due to its high frequency of selection in a single option (88%), as well as item 17, which had a low classification with the total score and did not differentiate between the contrasted groups. The resulting factors were classified as “Somatic A,” “Cognitive A,” “Somatic B,” and “Cognitive B” (Hernández-Pozo et al., 2008).

The study by De La Ossa et al. (2009) analyzed the psychometric structure of the Zung Anxiety Scale, using different versions of the instrument to assess its internal consistency. The research was based on a sample of 221 participants and applied an oblique rotation factor analysis (oblimin) to identify the underlying dimensions. Based on this approach, three factors were identified that group physical, cognitive, and apprehension symptoms, highlighting the multidimensional complexity of the anxiety construct. This analysis highlighted the multidimensional nature of anxiety and the importance of considering both physical and cognitive symptoms when assessing anxiety status in the study population.

In addition, alternative versions of the scale were developed, including a ten-item version with two factors and a shorter five-item version. These alternative versions provide shorter options for assessing anxiety, focusing on the most representative and relevant symptoms according to the results obtained in the study (De La Ossa et al., 2009).

In the research carried out by Benítez-Molina and Caballero-Badillo (2017), entitled Psychometric study of depression, anxiety, and family functioning scales in students at the Industrial University of Santander, these scales were

analyzed in a sample of 3,614 students. The proposed factor analysis focused on a single factor and excluded item six from the assessment.

In the work by Rojas Clavijo (2019) entitled Psychometric properties of the Zung Self-Rating Anxiety Scale (Zung SAS) in the Colombian population, a comprehensive analysis of the factorial structure of the scale was carried out in two different samples, each composed of 430 individuals. An exploratory factor analysis with oblimin rotation was performed, suggesting the presence of three optimal factors, which explain 50.324% of the variance. In this solution, it will be verified that certain elements are grouped into different dimensions, reflecting a complex interaction between the physiological and affective symptoms of anxiety.

The solution identified the following factors: Factor 1, called “Negative physiological symptoms,” includes items 7, 8, 11, 12, 14, 15, 16, 18, and 20, while Factor 2, designated “Positive physiological symptoms,” comprises items 5, 9, 13, and 19. Factor 3, known as “Affective symptoms,” groups items 1, 2, 3, 4, 6, and 10. In addition, an additional factor analysis was performed with two factors, which explain 39.37% of the variation, where a different grouping of items will be observed compared to the original proposal (Rojas Clavijo, 2019).

William W. K. Zung (1971) conducted a study entitled A Rating Instrument For Anxiety Disorders, in which he proposed a two-factor structure for the assessment instrument based on the DSM-II criteria. According to this structure, the first five items are considered affective symptoms, while the remaining 15 items are classified as somatic symptoms. This two-factor approach suggests a clear division between the affective and somatic aspects of anxiety disorders, providing a more detailed and specific assessment tool for identifying and measuring anxiety symptoms in patients.

In line with previous research highlighting the importance of adequately assessing anxiety symptoms, this study focuses on providing evidence on the construct validity and internal consistency of the Zung Self-Rating Anxiety

Scale, specifically in Ecuadorian healthcare personnel. Given that there are no previous confirmatory studies on its factorial structure in

this context, it is essential to validate the tool to strengthen its clinical and scientific use in local populations.

2. Materials and Methods

2.1. Procedure

Data collection for this study was carried out using a Google form, which was shared after a detailed presentation of the research objectives to hospital authorities and health centers.

2.2 Participants

The study sample consisted of 1,104 individuals employed in public health services in the province of Azuay, Ecuador. These participants were distributed across several key areas of health services, including hospitalization (N=356), outpatient care (N=306), emergency care (N=137), and others (N=305). In terms of gender distribution, the sample was predominantly composed of female participants, with a total of 808 individuals corresponding to 73.19%, compared to 296 male participants representing 26.81%. Regarding age, the range was between 22 and 66 years, with a mean age of 38.3 years and a standard deviation of 9. Most participants had tertiary education (N=591), followed by those with secondary education (N=192) and postgraduate education (N=141). The professional areas represented in the health units included nursing (29.2%), doctors (19.3%), nursing assistants (10.1%), administrative staff (5.5%), administrative assistants (5.3%), dentists (4.5%), paramedics (3.5%), primary care technicians (3.4%), laboratory staff (3.2%), pharmacy staff (2.5%), and other areas (13.4%). The inclusion criteria for selecting participants focused on their employment in health institutions, i.e., that they were employed and willing to participate in the study through informed consent.

As compensation for participating in this study, and in response to the participants' interest in their well-being, those who participated were

offered free access to a MOOC course designed for anxiety and stress management, with the possibility of including this training in their work history.

2.3. Ethical considerations

The ethical considerations to ensure respect, integrity, and protection of the participants involved in this study were as follows:

1. Informed consent: Informed consent was obtained from all participants prior to their inclusion in the study. This involves providing clear and understandable information about the objectives, procedures, risks, and benefits of the study, as well as the participant's right to withdraw at any time without adverse consequences.
2. Confidentiality and privacy: It is essential to protect the confidentiality of participants' data. Appropriate measures were implemented to ensure that the information collected is kept secure and accessible only to authorized researchers. In addition, the disclosure of personal data that could identify participants without their explicit consent was avoided.
3. Beneficence and non-maleficence: It was ensured that the study would have a positive impact on participants and the community at large. This involved maximizing the benefits of the study—such as the training provided—and minimizing any potential risks or inconvenience to participants.
4. Fairness and justice: Fairness in the selection and treatment of participants was ensured, avoiding any form of discrimination or unfair

bias. In addition, the equitable distribution of benefits derived from the study, such as access to the MOOC course, was considered to avoid unjustified privileges.

5. Ethical oversight: The study was reviewed and approved by a research ethics committee to ensure compliance with ethical principles. This oversight was crucial in assessing the suitability of the study, the protection of participants, and the proper handling of any ethical issues that may arise during the research process.

2.4. Instruments

The Zung Anxiety Scale, used as an assessment tool in this study, consists of 20 questions designed to measure anxiety levels in individuals. Of these questions, 15 are phrased in a positive sense in relation to anxiety, addressing symptoms such as excessive nervousness and rapid heart palpitations, among others. On the other hand, the remaining five questions (5, 9, 13, 17, and 19) are worded in a negative sense in relation to anxiety, reflecting perceptions of well-being and the absence of negative feelings. To rate the scale, participants were asked to indicate the frequency with which they experienced the characteristics described in each item during the week prior to completing the questionnaire on a Likert scale from 1 to 4. In this way, the scale captures the variability in the intensity and frequency of anxiety symptoms experienced by the subjects, providing a more comprehensive view of their emotional state during the assessment period.

A sociodemographic form used in this study collected detailed information about participants in order to better understand the sociodemographic context in which the research was conducted. The form included key information such as participants' email addresses to facilitate communication, each individual's gender, the specific place of work where they performed their duties, their age, their level of education, and the position or role they held in their respective institutions. In addition, data was collected on the specific area in which they worked, the marital status of the participants, the number of children they had, and their personal identification number. This set of information made it possible

to establish a complete sociodemographic profile of the participating healthcare professionals, which was essential for the subsequent analysis of the data and a comprehensive understanding of the results obtained in the study.

2.5 Data analysis

L The coding used for the analysis of the items was as follows: for items written in a positive form, the following values were assigned: never or rarely = 1, sometimes = 2, quite often = 3, and most of the time = 4. In the case of items written in a negative form, the scoring was reversed: most of the time = 1, quite often = 2, sometimes = 3, and never or rarely = 4.

A descriptive analysis of the items in the instrument was carried out in order to identify potential anomalous behaviors. To this end, we reported difficulty values, defined in classical test theory as the ratio between the observed score for each item and its maximum possible score, and discrimination values, understood as the correlation between each item and the total score on the scale. For difficulty, values between 0.2 and 0.8 are desirable, while very high or very low values indicate ceiling or floor effects, which reduce the informative value of the item. About inter-item correlation, values between 0.3 and 0.4 indicate adequate discriminatory capacity and improve internal consistency. In contrast, low or negative values indicate that the item contributes little information to the construct or may be poorly worded, which would compromise the overall reliability of the instrument.

To determine the factorial configuration of the Zung Anxiety Scale, both exploratory and confirmatory statistical analyses were performed. Internal reliability was assessed using Cronbach's alpha and McDonald's omega coefficients, obtaining indices above the threshold of 0.7 in both cases, indicating strong internal consistency (Cicchetti, 1994; Tavakol & Dennick, 2011)

In order to avoid overfitting in the factor models, the SOLOMON method was applied to divide the total sample (Lorenzo-Seva, 2022). The first subsample, consisting of 552 cases, was used to perform an exploratory factor analysis (EFA),

whose objective was to identify the underlying dimensions of the scale.

The adequacy of the sample was verified using the Kaiser-Meyer-Olkin (KMO) index, considering a value greater than .8 as the criterion, and Bartlett's sphericity test was performed. For factor extraction, the unweighted least squares method was used, and the solutions were evaluated using orthogonal (varimax) and oblique (oblimin) rotations

Since the literature documents several versions with divergent factor patterns, we considered it undesirable to choose a single solution for evaluation a priori. In this sense, exploratory factor analysis is important for three reasons: (a) it allows unrestricted investigation of the actual dimensionality of the data, (b) it facilitates empirical comparison with the structures reported in each previous version, and (c) it offers the opportunity to discover a unique configuration that is potentially better suited to our population.

To identify the optimal number of factors, a multiple approach was used, including: (a) the Very Simple Structure (VSS) index with complexities 1 and 2 (Revelle and Rocklin, 1979); (b) the Minimum Average Partial (MAP) procedure; (c) the classic BIC and sample size-adjusted BIC information criteria; and (d) parallel analysis. This triangulation allows us to counteract the limitations inherent in each metric: VSS and MAP favor sparse models, while BIC penalizes complexity asymmetrically and tends to over-retain factors in large samples; parallel

analysis, on the other hand, offers an empirical contrast with simulated data. According to the recommendation by Costello and Osborne (2005), when different criteria converge on more than one solution, the one with conceptual support and superior fit should be prioritized.

The second subsample ($n = 552$) was used to perform confirmatory factor analysis (CFA) to verify the identified structure and evaluate the factor models reported in the literature. For this analysis, a polychoric correlation matrix was used, given the ordinal nature of the items.

The goodness of fit of the model was evaluated using multiple indices and statistical values. The diagonalized weighted least squares (DWLS) method was used to calculate the chi-square statistic and its relative value (ratio between the chi-square and the degrees of freedom). The fit indices considered were the root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the standardized root mean square residual (SRMR).

To interpret the results, the criteria proposed by Hu and Bentler (1999) were used: an RMSEA value $\leq .06$ suggests an adequate fit, while CFI and TLI values greater than .95 indicate a good fit of the model. Likewise, an SRMR value less than .08 is considered indicative of an acceptable fit.

Data processing and analysis were performed using statistical software R, version 4.1.1.

3. Results

The items show moderate positive correlations between them (Table 1). In terms of difficulty and discrimination levels, most items show high discrimination and low difficulty. However, items 5, 17, and 20 denote greater difficulty and lower discrimination (Table 2).

Item 5 ("I feel that everything is fine and that nothing bad can happen to me") assesses a general perception of well-being and emotional security, which can be interpreted ambiguously depending on the cultural or personal context of the respondent. Item 17 ("My hands are usually

dry and warm”) addresses a physiological manifestation that is uncommon or difficult to associate directly with anxiety symptoms in this population. Finally, item 20 (“I have nightmares”) refers to a symptom associated with sleep that, although linked to emotional distress, may be influenced by multiple factors not necessarily related to anxiety. These conceptual characteristics could explain the low levels of discrimination and difficulties observed in these items.

3.1. Evaluation of the factorial structure using Exploratory Factor Analysis

The results obtained from the correlation matrix indicated that it is factorizable, given the high value of the Kaiser-Meyer-Olkin sample adequacy index ($KMO = .91$) and the significance of Bartlett’s sphericity test ($p < 0.001$). These indicators suggest that the data are suitable for factor analysis.

According to the criteria established by Velicer and the MAP method, it is recommended to

extract mainly one ($vss = .73$) or two factors ($vss = .83$). However, considering the review of the previous literature, one, two, three, and four factors were extracted, applying both oblimin and varimax rotation to evaluate the underlying structure. On the other hand, parallel analysis indicated the possible existence of six factors; however, this option was discarded due to the lack of theoretical support in the existing literature.

The unifactorial solution was the worst overall fit because it explained only 41% of the variance, and the fit indices $RMSR = .09$, $TLI = .71$, $RMSEA = .14$ (90% CI = .13–.14), and a fit based on values outside the diagonal of .96 is relatively poor. In addition, items 5 and 17 exhibit low factor loading ($<.30$) and low communality ($<.30$), while items 9, 13, 16, and 19 display low communality. In comparison, the two-factor models (varimax and oblimin) increased the explained variance to 49% and maintained a good residual fit ($RMSR = .05$; out-of-diagonal fit = .99); however, their absolute fit indices remained insufficient ($TLI = .78$, $RMSEA = .12$). In both, item 17 maintained low loading and communality, while items 16

Table 1. Polychoric correlation matrix of Zung (SAS) items
Source: Authors (2024)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Item 1	1																			
Item 2	0.82	1																		
Item 3	0.63	0.64	1																	
Item 4	0.69	0.72	0.63	1																
Item 5	0.17	0.21	0.08	0.19	1															
Item 6	0.6	0.63	0.56	0.64	0.15	1														
Item 7	0.55	0.53	0.45	0.56	0.09	0.56	1													
Item 8	0.64	0.6	0.51	0.67	0.15	0.63	0.72	1												
Item 9	0.4	0.41	0.31	0.4	0.57	0.34	0.3	0.38	1											
Item 10	0.57	0.62	0.5	0.58	0.19	0.63	0.53	0.57	0.32	1										
Item 11	0.47	0.53	0.45	0.53	0.12	0.59	0.58	0.62	0.27	0.58	1									
Item 12	0.45	0.5	0.46	0.58	0.14	0.61	0.52	0.58	0.27	0.55	0.74	1								
Item 13	0.27	0.29	0.26	0.32	0.48	0.31	0.21	0.26	0.59	0.27	0.25	0.38	1							
Item 14	0.39	0.43	0.38	0.44	0.11	0.51	0.56	0.54	0.25	0.43	0.53	0.55	0.19	1						
Item 15	0.46	0.49	0.37	0.48	0.11	0.46	0.49	0.51	0.24	0.44	0.49	0.41	0.13	0.4	1					
Item 16	0.35	0.34	0.34	0.34	0	0.3	0.34	0.35	0.14	0.32	0.34	0.34	0.09	0.3	0.44	1				
Item 17	-0.13	-0.1	-0.15	-0.12	0.11	-0.16	-0.14	-0.09	0.13	-0.1	-0.2	-0.16	0.13	-0.16	-0.1	-0.11	1			
Item 18	0.47	0.49	0.39	0.5	0.07	0.44	0.45	0.51	0.21	0.47	0.57	0.5	0.16	0.43	0.41	0.32	-0.21	1		
Item 19	0.32	0.29	0.27	0.26	0.34	0.26	0.23	0.29	0.44	0.25	0.2	0.18	0.38	0.2	0.18	0.15	0.12	0.18	1	
Item 20	-0.48	-0.49	-0.46	-0.53	-0.12	-0.47	-0.44	-0.46	-0.29	-0.45	-0.41	-0.5	-0.24	-0.37	-0.4	-0.28	0.18	-0.41	-0.2	1

Note. Only the lower triangular matrix is shown to avoid redundancy.

and 19 showed communalities of less than 0.3; the oblimin version also showed a factor–factor correlation of $r = .40$. The 3-factor solutions (varimax and oblimin) improved the fit ($\text{RMSR} = .04$, $\text{TLI} = .84$, $\text{RMSEA} = .10$) and increased the variance to 53%, but introduced insufficient discrimination in several items (7, 10, 15, 16, 17, 20), with insufficient communalities in 16, 17, and 19. The two four-factor alternatives were, in general terms, the best. The oblimin version explains 56% of the variance and presents the best parsimony indicators (average complexity = 1.3) without low factor loadings or discrimination problems; its overall fit is good ($\text{RMSR} = .03$, TLI

= .87, $\text{RMSEA} = .09$, off-diagonal fit = .99) and, although it shows a high correlation between two factors ($r = .78$), this association is theoretically consistent. In contrast, the varimax solution achieves the same overall fit indices ($\text{RMSR} = .03$, $\text{TLI} = .87$, $\text{RMSEA} = .09$). However, its complexity is higher (1.9). It reveals additional deficiencies: item 17 shows low factor loading, item 6 shows poor discrimination, and low communalities persist in items 16, 17, and 19. In addition, forced orthogonality generates a greater number of cross-loadings, which compromises the practical interpretability of the factors.

Table 2. Difficulty and discrimination of Zung (SAS) items
Source: Authors (2024)

Item number	Item	Mean	Standard deviation	Asymmetry	Difficulty	Discrimination
1	I feel more nervous and anxious than usual	1.7	.75	1.01	.42	.63
2	I feel afraid for no reason	1.47	.67	1.45	.37	.64
3	I wake up easily or feel panic	1.49	.74	1.6	.37	.48
4	I feel like I'm going to burst and break into pieces	1.39	.67	1.75	.35	.62
5	I feel that everything is fine and that nothing bad can happen to me	2.54	1.11	-.16	.64	.31
6	My arms and legs are shaking	1.3	.57	1.89	.33	.57
7	I suffer from headaches, neck or back pain	2.02	.95	.65	.50	.58
8	I feel weak and tire easily	1.81	.85	.86	.45	.66
9	I feel calm and can easily remain calm	2.18	1.06	.25	.55	.51
10	I can feel my heart beating very fast	1.47	.68	1.41	.37	.55
11	I suffer from dizziness	1.35	.63	1.97	.34	.53
12	I suffer from fainting spells or feel like I am going to faint	1.11	.39	4.2	.28	.42
13	I can breathe in and out easily	1.71	1.04	1.14	.43	.37
14	My fingers and toes feel numb or swollen	1.46	.75	1.67	.36	.46
15	I suffer from stomach discomfort or indigestion	1.91	.88	.72	.48	.48
16	I urinate very frequently	1.8	.83	.86	.45	.34
17	My hands are usually dry and warm	2.99	1.1	-0.7	.75	-.01
18	I feel hot flashes	1.38	.63	1.82	.34	.42
19	I fall asleep easily and sleep well through the night	2.36	1.12	.06	.59	.38
20	I have nightmares	3.53	.68	-1.5	.88	-.46

Average correlation between items = .215 · Cronbach's alpha $\alpha = .825$

3.2. Evaluation of the structure using confirmatory factor analysis

The original scale has been the subject of multiple previous studies, obtaining varied factorial solutions that respond to the particularities of each context. Based on this background, seven factorial models were evaluated, which are presented in Figure 1.

The first model, proposed by Olatunji et al. (2006) in their first study (Figure 1), considers four factors. In a second study, the same author proposes a similar four-factor structure, but with a different distribution of items (Figure 2). The third model (Hernández-Pozo et al., 2008) also suggests a four-factor structure (Figure 3). The fourth model, proposed by De La Ossa et al. (2009), proposes three factors (Figure 4).

The fifth model corresponds to a unifactorial structure, as proposed by Benítez-Molina and

Caballero-Badillo (2017) (Figure 5). The sixth model, proposed by Rojas Clavijo (2019), establishes three factors (Figure 6). Finally, the seventh model reflects Zung's original proposal (1971), which groups the items into two factors (Figure 7).

It should be noted that, following exploratory and confirmatory analysis, item 17 was removed from all models evaluated, as it consistently showed low factor loadings, high difficulty, and poor discrimination. This decision is consistent with previous findings in the literature, which have also recommended its exclusion.

When evaluating the goodness of fit of the different models (Table 3), it was determined that the most appropriate model is model 6, which consists of three factors: Physiological Response, Emotional Response, and Emotional Regulation.

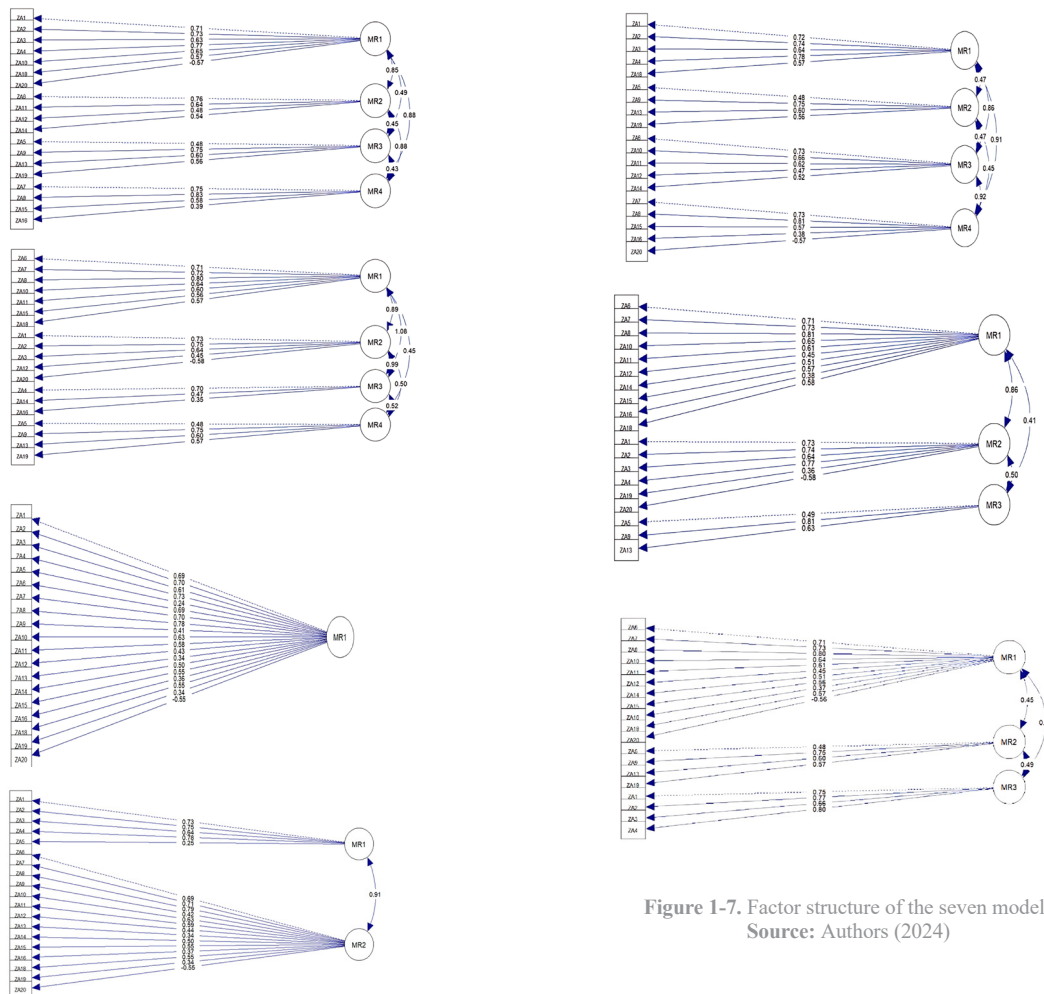


Figure 1-7. Factor structure of the seven models
Source: Authors (2024)

Table 3. Goodness of fit of the seven models
Source: Authors (2024)

Model		α	ω	AVE	χ^2	df	p value	CFI	TLI	SRMR	SRMR	RMSEA IC (90%)	
Model 1	Factor 1	.662	.739	.420	112.865	146.000	.981	1.000	1.006	.041	.041	.000	.005
	Factor 2	.715	.716	.404									
	Factor 3	.720	.723	.402									
	Factor 4	.736	.747	.440									
Model 2	Factor 1	.811	.809	.466	111.904	146.000	.984	1.000	1.007	.041	.041	.000	.000
	Factor 2	.720	.723	.402									
	Factor 3	.753	.756	.399									
	Factor 4	.484	.623	.412									
Model 3	Factor 1	.827	.835	.438	114.265	146.000	.976	1.000	1.006	.043	.043	.000	.000
	Factor 2	.385	.585	.440									
	Factor 3	.537	.542	.287									
	Factor 4	.720	.723	.402									
Model 4	Factor 1	.845	.852	.391	188.453	149.000	.016	.994	.993	.049	.049	.010	.031
	Factor 2	.525	.618	.344									
	Factor 3	.710	.723	.477									
Model 5	Factor 1	.8456682	.8504831	.2806263	411.711	152.000	0.000	0.958	0.952	0.068	0.068	0.049	0.062
Model 6	Factor 1	.778	.813	.380	105.654	149.000	0.997	1.000	1.008	.040	.040	.000	.000
	Factor 2	.720	.723	.402									
	Factor 3	.827	.826	.544									
Model 7	Factor 1	.697	.710	.338	400.136	151.000	.000	.959	.954	.065	.065	.048	.061
	Factor 2	.778	.793	.280									

4. Discussion

The descriptive analysis reveals that the difficulty values of the items vary between high discriminative ability and low difficulty; however, items 5, 17, and 20 present greater difficulty and lower discrimination.

One of the most consistent findings was the poor performance of item 17 (“My hands are usually dry and warm”), which had low factor loadings and virtually zero discrimination values in all replicated models, both exploratory and confirmatory. It also showed high difficulty, suggesting that its content may not have been clearly or relevantly interpreted by the population assessed. This methodological decision is consistent with previous findings in other Latin American contexts, where this item has also been excluded for similar reasons. The elimination

of item 17, therefore, is not only based on the psychometric indicators observed in this study, but also finds empirical support in the specialized literature.

In the case of items 5 (“I feel that everything is fine and that nothing bad can happen to me”) and 20 (“I have nightmares”), although both showed high difficulty indicators and reduced discriminatory power, it was decided to keep them on the scale. This decision was based on their acceptable factor loadings (above 0.5) and their conceptual contribution to the emotional regulation dimension. The simultaneous exclusion of these items negatively affected the internal consistency of this dimension ($\alpha < 0.7$), which led to their retention. These results reflect a necessary balance between psychometric

rigor and the preservation of the theoretical and methodological consistency of the instrument. However, a future revision of their wording is recommended to improve their clarity and discriminative power in the Ecuadorian context.

Regarding the factorial structure, several studies have applied exploratory factor analysis, obtaining varied solutions depending on the context of application. However, the three-, two-, and one-factor models are the most robust, in that order of preference. In the present study, the three-factor model best fits the data, establishing three clearly differentiated dimensions: physiological response, emotional response, and emotional regulation.

The original proposal focused on assessing the presence and intensity of anxiety symptoms, considering physical, emotional, and cognitive responses. In this context, the three-factor model shows theoretical consistency with the approach proposed by Beck and Emery (1985), which distinguishes characteristic physiological responses in individuals with anxiety, such as sweating, pain, weakness, tremors, and palpitations, identified in items 6, 7, 8, 10, 11, 12, 14, 15, 16, and 18. Likewise, emotional responses typical of anxiety are recognized, such as feeling nervous, experiencing fear or panic, and perceiving a loss of control (such as “bursting” or “breaking into pieces”), included in items 1, 2, 3, and 4. Finally, adaptive or emotional regulation responses that reflect self-control in stressful situations, such as staying calm, regulating breathing appropriately, and maintaining sleep hygiene, are identified in items 9, 13, and 19.

The reliability metrics and model fit indices are presented below: regarding the reliability of the dimensions, both Cronbach’s alpha and McDonald’s omega indicated an acceptable degree of internal consistency for the Physiological Response ($\alpha = .77$, $\omega = .81$) and Emotional Response ($\alpha = .72$, $\omega = .72$) dimensions. In the case of the Emotional Regulation dimension, internal consistency was considered good ($\alpha = .82$, $\omega = .82$). The CFI and TLI fit indices showed an excellent fit of the model to the data, while the SRMR (.40) and RMSEA (.0) reflected values indicating a perfect fit.

Considering the obvious problems associated with item 17, both in the present study and in the previous literature, it was decided to exclude this item. Likewise, given the background reported in the literature, we evaluated the three-factor model without items 5 and 20. However, the factor related to adaptive strategies reduced its internal consistency below the acceptable threshold (<0.7). Therefore, given that these items show acceptable factor loadings ($>.5$), we chose to keep them. Based on these adjustments, we conclude that this is the most appropriate factor structure for the Zung anxiety scale in the Ecuadorian context.

It is important to note that, as this is a heterogeneous sample in terms of sociodemographic variables such as educational level, occupation, profession, or marital status, the study has a greater scope in verifying the functionality of the scale. This is particularly relevant in the Ecuadorian context, where previous studies have lacked a validated instrument. Having a scale of this type benefits the community by providing accurate data that reflects the reality of the populations assessed. This facilitates the design and implementation of mental health promotion and prevention programs, both in work and clinical settings, where the presence of anxiety is a significant factor.

4.1. Limitations

One of the limitations of this study is that data collection was carried out during the pandemic, which raises the relevance of comparing quasi-control and quasi-experimental groups at different time points to assess possible contextual variations. In addition, the study sample is limited to healthcare personnel in the province of Azuay, Ecuador, which could restrict the representativeness of the results for other populations or contexts. This limitation could affect the generalizability of the findings to broader settings or different demographic groups. It is also important to consider that the scale used could reflect a specific cultural perspective, which would limit its applicability in populations with diverse cultural contexts, including within Ecuador itself. Therefore, cultural validation is essential to ensure the relevance and validity of the scale in different settings.

Another limitation is the reliance on information provided by participants through self-administered questionnaires, which could lead to response biases, such as a tendency to provide socially desirable responses or to exaggerate or minimize reported anxiety symptoms. Despite these limitations, the validation of the Zung

Scale in the Ecuadorian context represents a significant advance, as it provides a historical frame of reference, promotes efficiency in the use of resources, and provides a consolidated tool for research and clinical practice in the assessment of anxiety.

5. Conclusions

The present study achieved its objective of evaluating the psychometric properties of the Zung Anxiety Scale in an Ecuadorian context through exploratory and confirmatory factor analysis. It was determined that the most appropriate factorial structure is a three-factor model—corresponding to physiological, emotional, and adaptive (emotional regulation) responses—which is aligned with the theoretical framework proposed by Beck and Emery (1985). Likewise, the internal consistency and adequate fit of the model were evidenced by indices such as CFI, TLI, SRMR, and RMSEA.

The exclusion of problematic items (5, 17, and 20) improved the accuracy of the instrument, increasing its usefulness for assessing anxiety in a heterogeneous sample in the health field. This contextual adaptation represents an original contribution, as it facilitates the collection of more accurate data on the presence and intensity of anxiety symptoms in the Ecuadorian setting and supports the implementation of mental health

promotion and prevention programs. Finally, the implications of this study are relevant to the field of mental health and psychometrics, as it provides a validated tool adapted to the cultural and occupational characteristics of Ecuador.

The results of this study not only have implications in the clinical and research fields, but can also serve as technical input for the development of public policies and occupational health programs in Ecuador. The validation of a reliable and culturally relevant scale allows for the establishment of baselines for the timely detection of anxiety symptoms in healthcare personnel, which can be integrated into psychosocial surveillance systems, periodic psychosocial risk assessment protocols, and institutional preventive strategies. In addition, this evidence can inform administrative decisions regarding resource allocation, implementation of self-care programs, and strengthening of occupational well-being in the national health system.

6. Recommendations

Given that items 5, 17, and 20 have shown low discrimination and problems in their factor loading, we suggest a thorough review of their wording or, failing that, considering their permanent removal. Reformulating these items could contribute to a more accurate interpretation that is more aligned with the construct of anxiety in the Ecuadorian context. It is also recommended

that the study be replicated with samples from different regions and contexts, including the general population. In addition, it would be beneficial to use a longitudinal design to assess the temporal stability of the model, which would allow for corroboration of the three-factor structure and examination of factorial invariance across different demographic subgroups. Finally,

to reinforce the validity of the instrument, we suggest conducting additional research to explore convergent and discriminant validity by comparing the Zung Anxiety Scale with other standardized instruments. This will strengthen its

ability to accurately and differentially measure the various components of anxiety, increasing its applicability in both clinical and research settings.

7. Acknowledgments

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Social management and participatory research: a comparative case study

Gestión social e investigación participativa: Un estudio comparativo de casos

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Social management and participatory research: a comparative case study

Gestión social e investigación participativa: Un estudio comparativo de casos

Abstract

The study aimed to analyze, from a social management perspective, research projects developed by Ecuadorian universities and their contribution to the social innovation process. A comparative study of two research projects linked to the local community was conducted. The applied methodology was based on an ethnographic approach, including interviews, focus groups, participant and non-participant observation, as well as the analysis of documents and academic publications related to the projects and the universities in question. Among the study's findings, it was identified that both universities contribute to social innovation through projects that integrate the participation of local actors, traditional knowledge, and technical approaches. In conclusion, the analyzed participatory research projects significantly contribute to the sustainability and common well-being of the involved actors

Keywords: social innovation, participatory research, community engagement, social management, higher education

Resumen

El estudio tuvo por objetivo analizar, desde la gestión social, proyectos de investigación desarrollados por universidades ecuatorianas y su aporte al proceso de innovación social. Se llevó a cabo un estudio comparativo de dos casos de proyectos de investigación vinculados a la comunidad local. La metodología aplicada partió de un enfoque etnográfico en el que se incluyeron entrevistas, grupos focales, observación participante y no participante, así como análisis de documentos y publicaciones académicas sobre los proyectos y las universidades en cuestión. Entre los hallazgos del estudio se identificó que ambas universidades contribuyen a la innovación social a través de proyectos que integran la participación de actores locales, saberes tradicionales y enfoques técnicos. En conclusión, las investigaciones participativas analizadas aportan de forma significativa en la sostenibilidad y el bienestar común de los actores involucrados.

Palabras clave: gestión social, innovación social, investigación participativa, vinculación con la comunidad, educación superior

1. Introduction

In the current context, universities face the challenge of transcending their role as knowledge producers to become agents of social transformation. However, although research at Ecuadorian universities has grown in volume and complexity (Araujo et al., 2020), questions remain about its real impact on solving social problems and generating innovation with practical value for the local context. Higher education institutions are making efforts to strengthen their links with society. However, the effectiveness of these initiatives depends mainly on the substantive participation of the actors involved, including communities, organizations, and productive sectors (Juliani et al., 2019). In many cases, the lack of coordination between academia and local contexts limits the scope of social innovation, leaving the knowledge produced in the academic sphere and failing to be truly appropriated by society (Orellana-Navarrete et al., 2022).

This study stems from the need for universities to identify alternatives to develop their three substantive functions (teaching, research, and engagement with society) in an integrated manner and to direct their efforts toward developing research projects linked to the needs of local communities. To this end, it proposes promoting the development of projects through participatory methodologies, so that the actors involved are empowered from the diagnosis of needs to the design and implementation of new solutions that respond to and improve their situation, contributing to the process of social innovation (James et al., 2024). In this vein, social management offers a framework for analyzing how research processes can generate sustainable impacts through collaboration with various sectors and for overcoming the absence of clear participation structures and the predominance of unidirectional research models, which have been recurring obstacles to university-society interaction.

In this sense, the objective of this phase of the research is to analyze, from a social management perspective, research projects developed by

Ecuadorian universities and their contributions to the social innovation process. The aim is to contribute to the debate on the role of the university in promoting inclusive and sustainable innovation models grounded in social management and the co-construction of knowledge. A comparative study of two research projects linked to local communities was conducted. The following paragraphs present the theoretical and conceptual basis for the study. The methodology of the study is detailed below, followed by the analysis results considering the categories of participation proposed by social management, and finally, the discussion and conclusions.

1.1. Social Management and its focus on participation

Social Management (hereinafter, SM) emerges as a theoretical perspective that seeks to contribute to the analysis of political, social, and economic phenomena by privileging citizenship (Tenório, 1998). It seeks to reconstruct knowledge through social production, integrating intersubjective issues that give rise to a management that contrasts with market logic. SM pursues its objectives through the public sphere (Garcia et al., 2018), focusing on the common good of society. SM is based on critical theory as a guide for human action, with cognitive and reflective content, where collective interest takes precedence over individual benefit (Naranjo et al., 2018). SG promotes deliberative citizenship that integrates mutual understanding, equal conditions, a willingness to review and correct arguments through critical and reasoned dialogue, and the search for consensus.

In this sense, SG proposes a path toward emancipation, as it is more participatory and dialogical, with decisions made by integrating the opinions of different social subjects. In this way, it promotes a vision that recognizes that the management of society's demands can go beyond the state through social actors themselves (Tenório, 2016). Based on Habermas' proposal, SG is a form of management in which

decision-making is carried out from a dialogical perspective. In Habermasian theory, the public sphere constitutes the locus of communicative action, where participation in a dialogical scenario is made possible and guaranteed (Freitas & Ferreira, 2016). Thus, SG is defined as “collective decision-making, without coercion, based on the intelligibility of language, on dialogicity and clear understanding as a process, on transparency as a presupposition, and on emancipation as the ultimate goal” (Cardoso et al., 2019, p.132).

The collective decision-making process involves exercising ‘deliberative citizenship’. Tenório (2016) points out that this type of participation involves a series of debates and negotiations aimed at resolving various issues. Individuals participate in a democratic process to decide their social destiny; they need to be actively involved and influence the decisions that determine their situation as social subjects (Tenório et al, 2008). This participation is a necessary condition for the application of SG. The free and equal inclusion of individuals’ opinions and wishes in these processes is oriented towards the common good, promotes emancipation, and brings together different actors in society to make decisions through processes of understanding (França-Filho, 2008). In this vein, the categories of participation in SG proposed by Tenório et al. (2008) for deliberative citizenship are:

Discussion process: refers to the analysis of debate and decision-making in the public sphere where there is participatory equality and open dialogue. Habermasian communicative action supports discussion processes within the framework of GS and is influenced by context, traditions, and local values.

Inclusion: this category questions the foundations of communication’s power, which can occupy a privileged space, rendering the opinions and wishes of certain actors invisible. Inclusion allows subjects excluded from the system to enter public decision-making spaces.

Pluralism: focuses on diversity in public spaces, mapping the variety of interests and forms of action of individuals, giving rise to a real and democratic participatory process. This category

promotes the decentralization of power and the inclusion of local actors in decision-making.

Participatory equality: indicates that opportunities must be equal for all members of the community; any citizen with access to information and channels of deliberation can contribute to decision-making. Spaces for deliberation are only possible if they allow all individuals to contribute their ideas and actions.

Autonomy: consists of the ability of communities themselves to assess and solve their problems. Autonomy concerns how actors exercise their empowerment to achieve the goals pursued by the participatory process. In relation to SG, autonomy means that individuals participate in actions that improve the community’s conditions without coercion and that promote emancipation.

Common good: analyzes whether the results of the participatory process improve the living conditions of the community. It verifies whether there are tangible and intangible benefits for the community. The common good aims to address unmet social demands and to include individuals in decisions about the future of their community, based on deliberations grounded in transparency, intelligibility, and understanding of what constitutes real benefits for all.

These definitions have been discussed and applied in the analysis of several studies based on SG (Silveira et al., 2014; Cardoso-Cançado et al., 2019; Carmo, 2023). Although participatory processes are marked by asymmetrical power relations, conflicts, and various limitations (Wiesenfeld, 2014), SG offers an alternative analytical perspective for rethinking university-based society-related research projects.

1.2. Social innovation and universities

For this study, social innovation (hereinafter SI) is defined as the management of science and technology that seeks to solve social problems aimed at promoting inclusion, reducing inequality, and addressing the unmet needs of disadvantaged people (Murray et al., 2010; Moulaert et al., 2013; Phillips et al., 2015). SI includes actions developed by collaborative networks, using a

bottom-up approach that empowers communities and strengthens their capacity for action (Tracey & Stott, 2017; Domanski et al., 2020). In this way, SI emphasizes the participation of actors in the innovation process and their inclusive integration in decision-making to bring about long-term social transformations.

Da Silva and Pacheco (2018) analyze the convergences between SI and SG, identifying that both promote participation, empowerment, the common good, and the autonomy of the actors involved. Consequently, an innovation developed using SG constitutes a social innovation that improves a community's living conditions (Cajaiba-Santana, 2014; Howaldt & Schwarz, 2017; Avelino et al., 2019).

On the other hand, as part of national innovation systems, universities are important settings for fundamental and interdisciplinary research, and they guide what is researched and what is left aside (Arocena & Sutz, 2021). These guidelines are integrated into society in various ways,

and universities have the potential to promote social transformation by generating scientific and technological knowledge with and for local communities. Bayuo et al. (2020) argue that collaboration, co-creation, and participatory research are approaches that contribute to understanding universities' commitment to SI activities, grounded in their substantive functions of teaching, research, and engagement with society.

Similarly, Cunha and Benneworth (2020) point out that universities play a fundamental role in the development of local communities and contribute to the improvement of human and social capital. In this sense, universities can identify problems and design solutions, bring together key actors to validate proposals, scale solutions to maximize their social impact, and create collaborative networks to enhance innovation and replicate processes across different contexts (Juliani et al., 2019).

2. Materials and methods

Using a qualitative approach and mixed methods to gain a deep understanding of the phenomenon (Johnson et al., 2007), a comparative study was developed of two cases identified through systematic literature mapping and interviews with actors in the Ecuadorian higher education system (Orellana-Navarrete et al., 2024). The case study provided a meaningful understanding of the characteristics of the organizational processes in the selected projects (Yin, 2009). To this end, a protocol was designed to serve as a procedural guide, as suggested by Yin (2018).

Data collection was carried out from February 2023 to December of the same year through documents, interviews, focus groups, direct observations, participant observation, and

artifacts. Additionally, the points suggested by Yin (2018) regarding the use of multiple sources of evidence, the creation of a database, and the establishment of a chain of evidence to strengthen the validity and reliability of the results were considered. This process aligns with Patton's (2014) recommendation to use triangulation across multiple data sources (Table 1).

Intentional sampling was used, with members of the university and communities in each case who were present at workshops, training, and technical processes. Table 1 presents the number of participants for each method. For interviews and focus groups with project managers, researchers, community leaders, students, and others involved, data confidentiality was

ensured through the assignment of codes to each participant and the use of informed consent.

Given the importance of reflexivity in the qualitative research process (Torres-Quintero & Granados-García, 2023), it is worth noting that the principal investigator's role involved a sensitive positioning in relation to two distinct realities in each case. The perspective was influenced by certain affinities towards agroecological practices and community water management; therefore, to avoid bias in the interpretations, the information was verified through interviews and non-participant observations, as well as the documents of each project. The ethnographic approach followed a situated, ethical process that enabled objective analysis.

For data analysis, deductive coding was carried

out based on the categories of GS participation defined in section 1.1 and the subcategories presented in Table 2. These subcategories were adjusted to the context of the universities' projects, based on the literature on GS and participatory research, and on the analysis of data collected across all phases of the research. In agreement with Yin (2018), this strategy is applied when the underlying theoretical proposals have shaped both the data collection plan and the analytical priorities. In this sense, the conceptual framework proposed by Cunha and Benneworth (2020) is considered to analyze the process of social innovation in universities at the micro level, with a spatial scope in the local community, in the short term, and in a cross-cutting manner: participation.

Table 1. Sources of information
Source: Authors (2024)

	Case 1: Litoran Polytechnic School	Case 2: Salesian Polytechnic University
Project name	Water Harvesting Project in the Parish of Manglaralto	Project to Strengthen Production and Marketing Associations of Agroecological Producer Groups in the Canton of Cayambe
Documents	Scientific articles published by the Center for Research and Applied Projects in Earth Sciences (CIPAT) related to the project.	Books published on the university model followed by UPS, book by the Cayambe Peasant House Foundation and the Development Model.
Interviews	Director of CIPAT (E1) Lead researcher (E2) Representative of the Water Board (E3) Member of the Water Board (E4) Vice President of the Manglaralto Parish Government (E5)	Director of the research project (E6) Marketing Process Researcher (E7) Training Facilitator (E8) Agricultural student (E9) President of the cantonal women's movement Agroecological producers (E10)
Focus groups	Five CIPAT researchers (GF1)	Six agroecological producers (GF2)
Direct observation	Participatory process for measuring water salinity in wells with 10 participants (OD1)	Training process at an agroecological farm in the parish of La Esperanza with 12 participants (PO2)
Participant observation	Awareness workshop on water consumption with the community and members of the water board with 35 participants (PA1)	Training workshop on soil health and family bioeconomy with 30 participants (OP2)
Artifacts	Tape, water wells, freshwater distribution system (A1)	Soil tests, farms, agroecological fair (A2)

Table 2. Categories and subcategories of participation analysis
Source: Authors (2024)

Category	Subcategory
Discussion process	Dissemination channels: Existence and use of adequate channels for dissemination and access to information.
	Quality of information: Diversity, clarity, and usefulness of the information provided to stakeholders
	Cross-cutting spaces: Spaces that integrate perspectives across diverse sectors
	Negotiated authority: Decisions combine technical and local knowledge to achieve collaborative agreements.
	Dialogue structure: Organization of the stages of dialogue, including diagnosis, planning, implementation, and evaluation of projects
	Deliberation process: Dynamics in which stakeholders discuss and make joint decisions.
	Legitimization of consensus: Validation of agreements through visible results, documented commitments, or general acceptance by those involved
Pluralism	Participation of different actors: Involvement of associations, movements, organizations, and citizens in deliberative processes.
	Recognition of local knowledge: Valuing and integrating the knowledge, practices, and experiences of local communities in dialogue with other knowledge
	Inclusion of vulnerable groups: Participation of traditionally marginalized sectors.
	Equitable representation: Ensuring that all groups have fair representation.
	Interdisciplinary collaboration: Integration of diverse disciplines and approaches to address complex problems from multiple perspectives.
Participatory equality	Equal access to participation: Mechanisms that facilitate participation for all, avoiding economic, social, or cultural barriers.
	Equitable distribution of resources: Fair allocation of material, technical, and financial resources among the actors involved.
	Reconocimiento de contribuciones: Explicit appreciation of the contributions of different actors to the participatory process.
	Opportunities for participation: Design of activities and mechanisms that allow for the inclusion of all stakeholders, considering their needs and limitations.
	Equity in decision-making: Ensuring that all actors have equal weight in decisions and that these are not dominated by a single group or sector.
	Participatory evaluation: Involvement of participants in the evaluation of results.
Autonomy	Origin of proposals: Identification of the initiative behind the proposals and their consistency with the interests of the beneficiaries.
	Scope of actors: The extent to which communities have control over decisions that directly affect their environment and resources.
	Leadership profile: Characteristics of the decentralized management of the deliberation and implementation process
	Ability to exercise free will: Capacity of communities to lead and manage projects independently, making key decisions for themselves.
	Project sustainability: The project's capacity to be maintained in the long term without excessive dependence on the university or other external actors.
	Technical capacities acquired: Skills and knowledge acquired by communities to operate and manage projects autonomously.
Common good	Objectives achieved: Relationship between planned and achieved objectives, positive impacts of projects on the quality of life of the communities involved..
	Social equity: Reduction of social inequalities and promotion of justice.
	Environmental sustainability: Contribution of projects to the protection and sustainable use of natural resources.
	Tangible results for well-being: Visible benefits that directly impact communities.

Source: Adapted by the authors (2024) from (Tenório et al., 2008; Allebrandt, 2016; Bächtiger et al., 2018; Cardoso-Cançado et al., 2019; Salgado et al., 2019; Törnroth et al., 2022; Smith et al., 2023)

3. Results

As a starting point for analyzing the scope of SI projects, the relevance and pertinence of each proposal are considered. In the first case, the social innovation process is carried out through a partnership between the community of Manglar Alto, located on the Santa Elena Peninsula on the Ecuadorian coast, and the Escuela Politécnica del Litoral (ESPOL). The community is represented by the Manglaralto Regional Drinking Water Administrative Board (JAAPMAN). This collaboration began in 2005 through ESPOL's Center for Research and Applied Projects in Earth Sciences (CIPAT) and has developed several projects focused on solving problems related to water resource sustainability in the Manglaralto parish. The projects are managed using the Service-Learning (SL) methodology and Participatory Action Research (PAR). According to Carrión-Mero et al (2021), SL seeks to enable students to learn by doing, which is why the community is a key element in the educational experience. The university establishes partnerships to empower, develop capacities, and improve the well-being of the different actors. As for PAI, projects are developed that involve community-based research.

Approximately 20,000 residents benefit (Acosta et al., 2019) in the communities of Montañita, Río Chico, Cadeate, San Antonio, Libertador Bolívar, and Manglaralto. Each of these communities is represented by delegates who make up the JAAPMAN Water Board. The actors directly involved in the projects are JAAPMAN members, ESPOL students, teachers, and researchers. The outreach projects are linked to local development and focus on hydrogeological and environmental studies.

In the second case, social innovation is carried out through a project to strengthen the production and marketing of agroecological producers in the Cayambe canton. Through an agreement between the Casa Campesina Foundation and the Salesian Polytechnic University (UPS) Cayambe extension, the project begins with

nine agroecological associations, mostly made up of women. It is estimated that the project directly benefits 280 women and 25 men who are members of the agroecological vegetable production association, while the indirect benefit is for approximately 1,000 urban families who purchase and consume the products offered by the organization at agroecological fairs (Food and Agriculture Organization of the United Nations, 2022).

The main findings are presented below, identifying the projects' contributions to SI, with an emphasis on the actors' participation, and are organized into the categories described in Table 2.

3.1 Discussion process

In the specific context of universities, the discussion process includes formal and informal debates, public consultations, and other forms of deliberation that promote collective decision-making. For each case, the discussion processes are identified and summarized in Table 3.

The discussion process in Case 1 reflects a technical approach aimed at addressing specific needs, with leadership provided by the university. Case 2, on the other hand, demonstrates a participatory, horizontal approach that integrates diverse actors and promotes shared governance. Given the nature of the project, the second case offers a more inclusive deliberation process.

3.2 Pluralism

This category examines whether different sectors are integrated into participatory processes that respect the cultural and social diversity of the communities involved. The results presented reflect strengths in each case, as well as areas for improvement in the inclusion and equity of the participatory models applied. Table 4 details the results.

Table 3. Case analysis for the Discussion Process category
Source: Authors (2024)

Subcategories	Case 1	Case 2
Communication channels	Information is disseminated through direct messages to leaders, calls to the community through digital and analog media, and the participation of all is promoted through spokespersons from the water board (E1, OD1, OP1, GF1).	The university is in constant contact with the community through its leaders, and calls are made to participate in the different project activities with the support of the Casa Campesina through digital and analog media (E7, E10, GF2, OD2, OP2).
Clarity of information	The information is clear and focuses on water resource issues. There is a variety of formats, and the language used is understandable to all participants (E1, OD1, OP1, GF1).	The information is diverse and contextualized, covering technical, social, and economic aspects, adapted to the realities and needs of the communities (E7, E10, GF2, OD2, OP2).
Spaces for cross-cutting issues	Spaces for interaction with communities (technical roundtables, community meetings, workshops). Water boards actively participate as a key space for interaction between the university and community leaders (E2, E3, E4, GF1, OD1, OP1) (Carrión-Mero et al., 2021).	Spaces for interaction in community workshops, technical roundtables, and training sessions managed through the Casa Campesina in collaboration with the UPS (E9, E10, GF2, OD2, OP2) (Salgado-Guerrero, 2020).
Negotiated authority	Constant dialogue with communities. Decisions are made by consensus between the university, water boards, and other local actors. ESPOL's experience and technical knowledge are complemented by the ancestral knowledge of the communities (E5, GF1).	Communities have a voice to request modifications to projects in line with local needs, and the university moderates and advises based on what community members express and the project's objective (E6, E8, E10, OP2).
Structure of the dialogue	The university presents technical alternatives, while the communities validate, adjust, or reject the proposals based on their needs. The meetings include an initial participatory diagnosis stage, followed by the presentation of alternatives and an agreement phase (E2, E4, GF1) (G. Herrera-Franco et al., 2018).	Participatory sessions are held, including initial diagnosis, definition of objectives, and evaluation of results. Communities participate in the definition of methodologies and activities (E6, E7, E10, OD2) (Herrán-Gómez, 2017).
Deliberation process	Deliberations focus on specific problems identified by communities, such as water salinity. These deliberations allow for the comparison of different approaches (traditional and technical) and the reaching of agreements on how to combine them (E3, E5, GF1).	The deliberations allow for discussion of specific issues, such as the use of organic fertilizers, access to credit, or land management. Communities actively participate in clarifying doubts, raising issues, and building collective solutions (E6, E8, E9, E10).
Legitimization of consensus	Final decisions are shared through community workshops and meetings, ensuring that all stakeholders are in agreement and committed. Community leaders validate the agreements with their constituents before proceeding with project implementation (E4, GF1).	Consensus is legitimized through written agreements, photographs of progress, and follow-up meetings in the communities. Final decisions are shared with the communities and validated with their members (E8, E10, OD2).

Both cases reflect the diversity of actors participating in the projects, with members of the local community being integrated into both. Case 2 is distinguished by its focus on women in local communities. On the university side, in both cases, researchers, teachers, and students play different roles and collaborate with community members.

3.3. Participatory equality

This category examined the mechanisms that, in some way, encourage all actors to become involved in project activities. These findings are shown in Table 5.

In Case 1, there is progress in participatory equality regarding the access and recognition

of contributions from different actors, but greater efforts are needed to ensure equity in decision-making and the inclusion of vulnerable groups. In Case 2, the university made a significant commitment to participatory equality by prioritizing inclusion, recognizing local contributions, and providing resources equitably; however, in practice, the dialogue was concentrated among a small group of women leaders with greater command of Spanish and more experience interacting with technicians and facilitators. Several women expressed shyness about participating in participatory spaces or preferred to delegate their voice to more visible representatives.

Table 4. Case analysis for the Pluralism category
Source: Authors (2024)

Subcategories	Case 1	Case 2
Participation of different actors	Rural communities, water board members, researchers, and university students participate (E1, E4, GF1, OD1, OP1) (G. Herrera-Franco, 2015; Carrión-Mero et al, 2021)	Agroecological producers, students, academics, and representatives of the Casa Campesina participate in various activities (E6, E10, GF2, OD2, OP2).
Recognition of local knowledge	Ancestral knowledge is incorporated into the identification of wells, the planning of dams, and the design of water distribution and irrigation systems (E1, E4, GF1, OD1, OP1) (Carrión-Mero et al., 2023).	The project integrates the traditional agroecological practices of community members (E8, E10, OD2).
Inclusion of vulnerable groups	The project aims to provide a basic resource such as water to all members of rural communities (E3, GF1, OP1)	The project seeks to benefit women in the community in their role as agroecological producers and to advise them on the marketing of their products (E6, E7, E8, E10, GF2, OD2, OP2).
Equitable representation	There are spaces that allow for the integration of the voices of different actors, although there	Women play a leading role in workshops and deliberative processes (E9, E10, SDG2, SDG2)
Interdisciplinary collaboration	Technical, environmental, and social knowledge is integrated into the project (E1, E2, E3, GF1, OD1, OP1) (Carrión-Mero et al., 2020).	Knowledge of agroecology, economics, the environment, and communication is integrated (E6, E7, E10, OD2, ODP) (Cazorla et al., 2014).

Table 5. Case analysis for the Participatory Equality category
Source: Authors (2024)

Subcategories	Case 1	Case 2
Equal access to participation	Participation is open to the community, but there is limited access for actors such as women or young people in the community in decision-making roles (E1, GF1, OD1, OP1) (Carrión-Mero et al., 2021)	Spaces are established to ensure diversity among actors. Given the nature of the project, the participation of women is included as a priority (E7, E9, GF2, OD2, OP2) (Herrán-Gómez, 2017).
Equitable distribution of resources	Activities such as the construction of dams and wells seek to benefit all members of the communities. Decisions on resource allocation are made by technical staff, with some communities having more influence on decisions due to their proximity to natural resources (E2, OD1, OP1) (Carrión-Mero et al., 2023).	Technical and educational resources are provided equitably to communities. Women producers can access economic resources through the Casa Campesina on an equitable basis (E6, E10, GF1, OD2, OP2) (Ferraro, 2012)
Recognition of contributions	The contributions of community members are recognized. Local experiences are valued (E2, E4, GF1, OD1) (Carrión-Mero et al., 2021)	Community practices and local knowledge are recognized and integrated into project activities (E6, E7, E10, GF1, OD2, OP2) (Salgado-Guerrero, 2020).
Opportunities for participation	Meetings and workshops are held at accessible times, and activities are open to the community and other external actors (E3, OD1, OP1).	Biofairs and workshops are organized at accessible times, and there is openness to the participation of various actors (E7, E8, E10, OD1, OP1)..
Equity in decision-making	Decisions are made by participants with experience and technical knowledge, with community leaders playing an advisory role (E5, OD1, OP1) (G. Herrera-Franco et al., 2018).	Decisions are made jointly with members of the university community and local communities (E8, E10, SDG1, SDG1).
Participatory evaluation	Technical results, such as the effectiveness of implemented water infrastructure, are measured, with the participation of key stakeholders (GF1, OP2).	The evaluation is inclusive, considers multiple dimensions, and encourages collective learning (E6, E10, SD2)

3.4 Autonomy

This category analyzes the degree to which the actors involved in the projects achieve independence in managing their resources and processes, as well as in decision-making.

In both cases, this autonomy is linked to the development of technical capacities, community empowerment, and the long-term sustainability of the initiatives implemented. The main results are presented in Table 6.

In this category, it can be observed that while in Case 1, the university applies a model of technical skills transfer that empowers water board staff, it could seek alternatives to integrate other community members into decision-making on the different processes related to the project (financial, sustainability, among others). In Case 2, priority is given to community autonomy led by women producers through the implementation of the project for its long-term sustainability

3.5 Common good

As a final category, the common good focuses on analyzing the contribution of the two cases to collective well-being and on balancing the social, environmental, and economic impacts of the communities in which each project is developed. Table 7 describes the contributions of each case to the common good.

Table 6. Case analysis for the Autonomy category
Source: Authors (2024)

Subcategories	Case 1	Case 2
Origin of proposals	The community requests advice from the university, which then promotes proposals from a technical perspective based on assessments that take into account the community's needs (E1, OD1)	The communities identify their needs and, together with the university and Casa Campesina, proposals are generated to develop the projects (E10, GF2).
Scope of the actors	Actors with specialized technical knowledge from the university and the board have decision-making power, while other community members have a consultative voice (E2, E4, OP1, GF1) (Herrera-Franco et al., 2020)	Decision-making is shared among the different actors involved in the project phases, with a horizontal governance approach (E6, E10, OD2, OP2).
Leadership profile	Technical specialists from the Water Board and the University lead the project stages (GF1, OD1)	Community representatives, researchers, students, and other actors have leadership roles (E6, E8, OD2).
Ability to exercise one's own will	The procedures for diagnosis and solution design give rise to the exercise of individual and collective will (E2, E3, E4, GF1) (Carrión-Mero et al., 2021)	Through agroecological production activities, bio-fairs, and entrepreneurship, community members exercise their will and play a leading role (E6, E8, E10, SDG2).
Project sustainability	Long-term autonomy could be limited due to the need for specialized technical equipment (E3, GF1, SDG1, SDG2)	Local actors are trained in technical and administrative skills (E6, E7, E10, GF2, SDG2, SDG2)
Technical capacities acquired	Technical training is provided for the management of water infrastructure. Communities are somewhat dependent on the university given the need for specialized equipment and more advanced technical knowledge for complex problems (E3, E5, GF1, OP1).	Rural communities acquire technical and business skills through workshops and training, and independence in the management of their projects is encouraged (E6, E7, E8, E10, OD2, OP2).

Table 7. Case analysis for the category of common good
Source: Authors (2024)

Subcategories	Case 1	Case 2
Objectives achieved	The project addresses the lack of access to water, which directly benefits rural communities and improves their quality of life (E1, E2, E3, E4, GF1) (Carrión-Mero et al., 2021).	The project promotes the comprehensive development of communities through advice and support in agroecological production and the marketing of their products (E6, E10, OP2)
Social equity	Equal access to the basic resource of water is prioritized (E5, GF1) (Carrión-Mero et al., 2021; Herrera-Franco et al., 2018).	The participation of rural women is encouraged (E6, E10, OP2) (UPS Cayambe Research Station, 2023).
Environmental sustainability	Green filters and aquifer recharge seek to mitigate the environmental impact of human activities and protect water resources (E2, E4, GF1) (Carrión-Mero et al., 2021).	Agroecological practices promote environmental sustainability by combining ancestral knowledge with technological innovations (E6, E8, E10, SD2).
Tangible Results for Well-being	Improved access to water and sanitation for rural communities. Increase in the number of water wells and construction of a dam (E4, GF1, SD1, OP1) (Carrión-Mero et al., 2020, 2023; Herrera-Franco et al., 2020)	Economic income through bio-fairs and the supply of organic products for the personal consumption of producers and their families (E6, E8, E10, OD2, OP2)

In terms of the contribution to SI, Case 1 demonstrates strength in technical advisory processes and a tangible impact on access to water through wells, dams, and distribution systems. On the other hand, Case 2 is based on a participatory, horizontal governance approach, focuses on empowering women, and has an impact on families in rural communities through organic gardens and markets. Areas for improvement in Case 1 include including other

participants to increase the diversity of actors, as well as strengthening decision-making processes and developing autonomous capacities in communities for the long-term sustainability of the project. In Case 2, greater participation could be promoted among women in the communities who, despite having access and a voice, do not necessarily express their opinions in discussion spaces.

4. Discussion

In line with Murray et al. (2010), the contribution to the SI process is identified in Case 1 as the improvement of beneficiaries' living conditions through a participatory model that combines technical and traditional knowledge to address water management and access. Meanwhile, in Case 2, a participatory model is implemented that integrates rural communities, mainly women, through dialogue circles and bio-fairs, and the university promotes cross-cutting spaces where knowledge converges, and collaborative discussion is encouraged. In both cases, the SI process involves not only the creation of new products and services but also, as Cajaiba-Santana (2014) affirms, the transformation of social structures and relationships, promoting sustainable and meaningful changes in society.

The initiatives analyzed in both cases show that universities play a fundamental role in improving SI processes within their local contexts. In Case 2, the biofairs demonstrate the relationship between entrepreneurship and SI in Ecuador, as proposed by Carpio-Freire and Navarrete (2019). Similarly, Vargas-Merino (2021) affirms that university research is fundamental to promoting SI. In this context, the development of participatory research grounded in an inclusive approach reinforces social cohesion. It enables more representative, relevant decisions for beneficiary communities, as seen in the two cases presented.

The results presented underscore the importance of adapting discussion processes to the realities and needs of communities, ensuring effective inclusion and a structure that supports the co-creation of solutions. In line with the study by Hall and Tandom (2017), universities have the opportunity to create research and learning partnerships with community leaders and social movements, thereby generating new higher education structures that create spaces for learning and sharing, as observed in both cases studied. The contribution to SI is strengthened by expanding spaces for transversality and by establishing mechanisms that enable communities to exercise their political will more actively and sustainably, as stated by Allebrandt (2016).

Among the findings, in Case 1, the participation of community actors is limited due to the project's technical nature and its dependence, to a certain extent, on specialized equipment. In Case 2, the nature of the project lends itself to greater inclusion and participation by community members; however, some members were identified who attended various activities but did not express their views, limiting the diversity of perspectives in decision-making. These findings align with those of Cornwall (2008), who warns that community participation can become exclusive to actors with greater linguistic or social capital, posing a challenge for research initiatives that apply participatory methodologies.

In the two cases analyzed, the relationship between the universities and the communities working on the projects spans more than 15 years, linking research and outreach projects consecutively. This consolidates links with various actors and strengthens the public sphere. This finding is also highlighted by Hagedoorn et al. (2023), who argue that addressing SI processes is necessary to offer long-term solutions to social and environmental challenges. On the other hand, integrating a participatory approach and promoting the integration of all actors through horizontal governance contribute to SI processes. The effectiveness of projects that may arise from universities depends on building strong, sustained demand capable of putting knowledge directly at the service of shared social objectives, among which reducing inequality is significant (Arocena et al., 2015). In this regard, it was observed that, in both cases, the interests of researchers, teachers,

and students play a key role in shaping projects and directing their efforts toward improving the living conditions of local populations, as Thomas and Pugh (2020) point out.

The integration of a participatory approach into projects fosters an interdisciplinary, multidimensional approach that promotes empowerment, innovation, and a socio-political sense among stakeholders. This aspect benefits both members of the local community and the students involved in the projects (Kalemaki et al., 2021), promoting the pursuit of a more democratic and sustainable society. The categories analyzed in each case offer the possibility of rethinking projects that manage science and technology from a participatory approach. Although these projects are carried out in contexts with particular complexities and challenges, universities have significant potential to promote SI.

5. Conclusions

Although universities have traditionally been recognized for their role in technology transfer and knowledge exchange, their contribution to SI has been less explored. It is necessary for universities not only to generate knowledge but also, by integrating with social actors, to promote SI processes that favor inclusive and sustainable development. This study has analyzed, from a GS perspective, two research projects developed by Ecuadorian universities and their contribution to the SI process. It concludes that it is possible to integrate multiple actors through participatory processes, combining technical, scientific, and local knowledge.

Improving access to water and water management in rural communities or promoting the creation of sustainable enterprises and inclusive economic circuits through bio-fairs and agroecological production are projects that reflect how universities are SI agents that catalyze local development when adapted to the realities and resources of communities. In the case of the Water Sowing and Harvesting project, analysis

based on SG as a theoretical foundation shows technical advances, but also reveals partial autonomy conditioned by concentrated leadership and dependence on technical support. For its part, strengthening agroecological producers promotes forms of female self-organization, though specific gaps persist that complicate community participation. Participatory experiences face various tensions and challenges; however, they offer an opportunity to manage research projects at universities that promote and highlight the importance of SI.

Achieving active participation in projects fosters social cohesion and strengthens local governance; participatory governance is an essential element of SI. One of the main implications of this study is to consider GS as an alternative that underpins the development of research projects, opening up a new field of action that emphasizes the interdependence that exists between individuals, in the sense of perceiving the dynamics of their own actions in the public sphere. Actors with specialized technical knowledge are called upon

to collectively (re)construct public spaces in order to achieve collective well-being. In this context, well-understood interests give rise to new perspectives that favor participatory processes based on the diagnosis of the problems that drive the research projects developed by universities.

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La huella digital: una revisión sistemática del impacto de la impresión 3D en la enseñanza artística

The Digital Footprint: A Systematic Review of the Impact of 3D Printing in Art Education

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La huella digital: una revisión sistemática del impacto de la impresión 3D en la enseñanza artística

The Digital Footprint: A Systematic Review of the Impact of 3D Printing in Art Education

Resumen

El uso de la impresión 3D tiene el potencial de contribuir positivamente al arte y la educación. Esta revisión sistemática se ha realizado para identificar estudios previos que aborden los beneficios y desafíos en el uso de impresoras 3D en la educación artística. El periodo de análisis de las publicaciones revisadas fue entre 2017 y 2024 para asegurar la relevancia y actualidad del estudio. Los resultados iniciales arrojaron 220 resultados y el segundo cribado resultó en 113 registros que fueron revisados en función de los criterios de inclusión y exclusión. Este tercer cribado dio como resultado 10 artículos que fueron analizados y comparados. Se concluye que la impresión 3D sirve como herramienta pedagógica eficaz con ciertos retos a superar y del mismo modo, se ha identificado que el uso de impresoras de este tipo en el ámbito de la educación artística aún no está lo suficientemente extendido y conocido.

Palabras clave: Impresión 3D, educación, arte, innovación, creatividad.

Abstract

The use of 3D printing has the potential to contribute positively to art and education. This systematic review has been conducted to identify previous studies that address the benefits and challenges in the use of 3D printers in artistic education. The period of analysis of publications reviewed was between 2017 and 2024 to ensure the relevance and timeliness of the study. The initial results of the review yielded 220 results from which a second screening resulted in 113 records that were reviewed against inclusion and exclusion criteria. This third screening resulted in 10 articles that were analysed and compared. It is concluded that 3D printing serves as an effective pedagogical tool with certain challenges to overcome and at the same time it is identified that the use of printers of this type in the field of arts education is not yet sufficiently widespread and well known.

Keywords: 3D printing, education, art, innovation, creativity.

1. Introducción

En la era digital en la que vivimos, la impresión tridimensional (3D) surge como una poderosa herramienta con el potencial de conectar el mundo digital y la representación de la realidad de una manera creativa e innovadora (González-Zamar y Abad-Segura, 2023). La impresión 3D se ha convertido en una tendencia en el arte y, a su vez, al igual que la innovación, ha comenzado a implementarse en proyectos educativos para mejorar los procesos de aprendizaje.

La innovación y la creatividad son fundamentales para los seres humanos, ya que les ayudan a desarrollar ideas innovadoras, a adaptarse eficazmente a un mundo en constante cambio, a encontrar conexiones entre diferentes conceptos, en definitiva, a desarrollar un pensamiento divergente. Además, la creatividad no debe entenderse como un rasgo que solo poseen las personas virtuosas; todo el mundo debería tener acceso a ella.

El término «huella digital» del título se utiliza como metáfora conceptual que alude al impacto duradero y rastreable que la incorporación de las tecnologías digitales, como la impresión 3D, tiene en el entorno educativo, especialmente en el ámbito del arte. No se refiere a la huella digital en su sentido informático (identidad digital), sino a la marca transformadora que estas tecnologías dejan en el proceso de enseñanza-aprendizaje.

En términos educativos, la impresión 3D puede contribuir de manera significativa a metodologías de enseñanza-aprendizaje flexibles, ya que requiere una buena colaboración y creatividad tanto por parte de los estudiantes como de los profesores (González-Zamar et al., 2023). Sin embargo, con la saturación de las tecnologías en la sociedad contemporánea, surgen preocupaciones sobre sus contribuciones reales en estas áreas y los retos a los que se enfrentan. Por lo tanto, este estudio busca identificar estudios previos que aborden el uso de la impresión 3D en el arte y la educación.

1.1. Origen de la impresión 3D

La fabricación aditiva o impresión 3D se define como la producción de objetos tridimensionales a partir de una plantilla digital. La fabricación se realiza mediante capas aditivas utilizando diversos tipos de materiales, como plástico, metal, nylon y muchos otros (Mpofu et al., 2014). La impresión 3D supone un gran avance para toda la humanidad y hoy en día se utiliza en múltiples sectores. Sus orígenes se remontan a la década de 1970, sin embargo, la primera patente de impresión 3D fue concedida a Hideo Kodama, de origen japonés, en 1981. Kodama utilizó una resina fotosensible que se polimeriza con luz ultravioleta (UV). Sin embargo, su publicación de investigación no tuvo un impacto significativo y su proyecto fue abandonado por la institución a la que se presentó (Wohlers et al., 2016; Brown, 2023).

Tres años más tarde, en 1984, tres inventores franceses, Le Mehauté, de Witte y André, presentaron una solicitud de patente para la producción industrial de componentes mediante el curado de polímeros fotosensibles por radiación UV. Sin embargo, no tuvieron éxito y su solicitud fue rechazada. Ese mismo año, en Estados Unidos, Chuck Hull solicitó una patente para el proceso de estereolitografía. El inventor utilizó esta palabra para definir la creación de objetos mediante el endurecimiento de capas de su sección transversal. También se le atribuyen importantes contribuciones al campo de la impresión aditiva, ya que creó el formato de archivo STL (Standard Triangle Language) y métodos para calcular y dividir modelos en capas para que pudieran imprimirse. El formato STL (estereolitografía) se utiliza ampliamente para exportar y compartir modelos 3D, especialmente para aplicaciones de impresión 3D, ya que codifica la geometría de la superficie de un objeto utilizando una malla de triángulos. Sin embargo, los archivos STL no son interpretados directamente por las impresoras 3D. En su lugar,

primero deben ser procesados por un software de corte, que convierte los datos geométricos en instrucciones legibles por la máquina, normalmente en formatos como G-code, 3MF o AMF. Estos formatos contienen los comandos específicos que controlan los movimientos de la impresora, la altura de la capa y la extrusión del material durante el proceso de impresión. Por lo tanto, aunque el STL es esencial en la fase de diseño y preparación, debe someterse a un preprocesamiento antes de la fabricación. Hull obtuvo la patente en 1986 y creó la empresa 3D Systems Corporation para introducir la primera impresora 3D de uso comercial, la SLA-1 (Stereolithography Apparatus) (Wohlers et al., 2016; Ochoa Guevara, 2023).

Tras la importante contribución de Hull, se han presentado nuevas innovaciones en el campo de la fabricación aditiva, gracias a las cuales el mercado se ha ido abriendo con nuevos métodos, materiales y patentes, entre los que destaca el modelado por deposición fundida (FDM), inventado y patentado por Scott Crump en 1989. Este método consiste en pasar un hilo de material termoplástico a través de una boquilla caliente que funde el material y crea capas de la pieza que se va a imprimir. Actualmente es el método más popular entre el público. A principios de la década de 1990 se produjo un gran desarrollo de la tecnología y comenzaron a aparecer varias empresas de impresión 3D (Brown, 2023).

En 2004, Adrian Bowyer creó el proyecto RepRap, cuyo nombre es una abreviatura de Replicating Rapid-prototyper. Su objetivo es crear impresoras asequibles que puedan replicarse a sí mismas (Heredía y Franco, 2014; Dixit, 2022). Este proyecto tuvo un impacto significativo entre el público gracias a su uso gratuito y su fácil producción. Como resultado, surgieron posteriormente múltiples empresas comerciales de impresión 3D, entre las que se encuentran: Ultimaker, Makerbot, Creality, Prusa, etc. Estas empresas han ido creciendo en el mercado hasta convertirse en líderes en la distribución de impresoras 3D con utilidad en múltiples campos, desde la ingeniería, aplicaciones biotecnológicas como la impresión de órganos y tejidos, hasta la construcción y la industria deportiva, etc. (Ochoa Guevara, 2023; Dixit, 2022; Siemiński, 2021).

1.2. Uso educativo y artístico de la impresión 3D

La rápida evolución de la tecnología en el campo de la impresión 3D ha transformado muchos sectores diferentes, como vimos al final del capítulo anterior. Su contribución al ámbito de la educación ha sido igualmente importante, gracias a la rapidez con la que se ha convertido en una tecnología versátil y de fácil acceso. La impresión 3D es una forma innovadora de expresión plástica que permite a los estudiantes explorar diferentes prácticas artísticas y ofrece nuevas posibilidades de interacción. Un ejemplo de ello es el uso de la propia impresión 3D (González-Zamar, 2024).

Las impresoras 3D han abierto nuevas posibilidades y herramientas de aprendizaje para educadores y estudiantes que sirven para desarrollar el enfoque pedagógico STEAM, cuya abreviatura significa Ciencia, Tecnología, Ingeniería, Arte y Matemáticas (Wendt et al., 2020). Este enfoque está ganando importancia en el ámbito educativo debido a su objetivo de cultivar las habilidades creativas y formar en la resolución de problemas, competencias indispensables en la sociedad actual, donde la imaginación creativa resulta ser más importante que los conocimientos teóricos. Por lo tanto, este enfoque utiliza herramientas innovadoras como la programación, los robots, los drones, la realidad virtual y la impresión 3D (Chun, 2021).

Puede dar la impresión de que los programas de diseño 3D están destinados únicamente a profesionales, pero en los últimos años se han desarrollado herramientas gratuitas y están al alcance de todos, son gratuitas y fáciles de usar, como, por ejemplo, Tinkercad. Además, los precios de las impresoras 3D han ido disminuyendo y cada vez son más accesibles en entornos educativos (Farnicka y Serrano, 2019).

Para comprender hasta dónde puede llegar el uso educativo de las impresoras 3D, aquí hay algunos de los campos en los que están encontrando su utilidad: se pueden imprimir artefactos históricos para examinarlos, los estudiantes de diseño e ingeniería pueden imprimir sus trabajos para examinar un mundo real. En relación con temas geográficos, es interesante imprimir mapas para

visualizar datos geográficos; los estudiantes de química pueden imprimir modelos de moléculas para un mejor análisis; en el campo de la biología es muy útil imprimir las formas de las células, los virus, los órganos y otros elementos biológicos para su posterior estudio, etc. (Assante et al., 2020).

La impresión 3D supone un gran avance en términos de innovación en la educación y, entre las numerosas ventajas que ofrece su uso, destacan las siguientes: el compromiso y la emoción que esta tecnología genera entre los estudiantes, que pueden participar activamente en todas las etapas, desde el diseño hasta la creación de objetos; la participación activa de los estudiantes, que fomenta su motivación en el proceso de aprendizaje; nuevas posibilidades de aprendizaje gracias a la manipulación directa de modelos 3D de objetos tratados en clase que normalmente serían de difícil acceso y cuya forma 2D no proporciona el mismo nivel de información; el desarrollo de habilidades para la resolución de problemas al superar diversas dificultades de la tecnología de impresión 3D utilizada. Además, el uso de impresoras 3D resulta especialmente útil como herramienta de apoyo para mejorar el proceso de aprendizaje de los estudiantes con dificultades, como las personas con discapacidad visual (Assante et al., 2020).

Se puede observar que la impresión 3D puede tener un sinfín de contribuciones en el sistema educativo. De hecho, las tecnologías han comenzado a cobrar gran importancia y ser indispensables en la vida cotidiana de los estudiantes, y hay pruebas del impacto de la impresión 3D en todos los niveles educativos debido a sus importantes beneficios en términos de estimulación de la imaginación y la creatividad, creación de arte 3D, desarrollo de la percepción espacial y muchos otros aspectos. Sin embargo, en lo que respecta a la relevancia de la impresión 3D en la educación, es fundamental destacar la importancia de la formación del profesorado en esta área para maximizar los beneficios en el desarrollo integral de los estudiantes (Chun, 2021).

A pesar de la inmensa importancia de la impresión 3D en la educación, los maestros se enfrentan a

dos retos importantes a la hora de integrar las tecnologías en la enseñanza: las limitaciones de tiempo debido a los planes de estudio y la falta de experiencia y formación en estas áreas. Es importante comprender la relevancia de la naturaleza interdisciplinaria que estas tecnologías permiten trabajar y desarrollar varias habilidades en los estudiantes al mismo tiempo. Por lo tanto, es esencial proporcionar oportunidades de desarrollo profesional a los profesores para mejorar todo el proceso de enseñanza-aprendizaje y conectar el aprendizaje con el mundo fuera del aula (Wisdom y Novak, 2020).

El profesor es responsable de garantizar que el uso de tecnologías innovadoras esté en consonancia con los objetivos de aprendizaje. Es necesario tener muy bien definidas las competencias que se van a desarrollar, contar con una base sólida de conocimientos en materia de educación cognitiva y, por último, dominar las herramientas que se van a utilizar, como en este caso sería la impresión 3D. El profesor se convierte en el guía durante el proceso y el aprendizaje de los alumnos dependerá del andamiaje que el profesor pueda ofrecer (Sullivan, 2020).

Es importante distinguir entre el modelado digital y la impresión 3D. El modelado digital se refiere al proceso de diseño tridimensional asistido por computadora, utilizando software especializado como Tinkercad, Fusion 360 o Blender, en el que se crean representaciones virtuales de objetos. La impresión 3D, por otro lado, es el proceso físico mediante el cual estos modelos digitales se materializan utilizando una impresora que deposita capas de material, normalmente plástico (como PLA o ABS), hasta formar un objeto tangible. Los dos procesos son complementarios, pero no sinónimos.

Además de su valor instrumental, la impresión 3D en la educación artística plantea nuevas preguntas sobre la relación entre el proceso creativo y el objeto final. El uso de herramientas digitales transforma la noción de autoría y autenticidad en el arte. Este debate cobra relevancia en los entornos educativos, donde la reproducción digital puede desafiar el aprendizaje basado en la expresión individual y la técnica manual.

Por último, es esencial recordar que la expresión visual y plástica son ámbitos educativos clave que van más allá de la mera creatividad artística. Cuando se integra de manera efectiva en el entorno educativo, la impresión 3D enriquece el proceso de aprendizaje, se adapta a diversas modalidades de aprendizaje y contribuye al desarrollo integral de los estudiantes.

Este enfoque holístico posiciona la expresión visual como un componente esencial en la formación educativa, demostrando que la tecnología puede y debe utilizarse de manera responsable y beneficiosa para la vida cotidiana y el desarrollo académico (González-Zamar, 2024).

2. Materiales y métodos

Para el análisis y la interpretación de los datos, se ha seleccionado la metodología de una revisión sistemática cualitativa, cuyo objetivo general es identificar estudios previos que traten sobre el uso de la impresión 3D en el arte y la educación. Se plantea la siguiente pregunta de investigación: ¿es beneficioso el uso de impresoras 3D en la educación artística?

2.1. Revisión sistemática

En esta sección se contextualizan las búsquedas en bases de datos que se han llevado a cabo para identificar estudios relevantes para el tema que se debate y, a continuación, se presentan los datos obtenidos en el proceso junto con los criterios que se han tenido en cuenta. En este sentido, la revisión se ha realizado siguiendo el enfoque PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), utilizando Scopus como base de datos principal. Los criterios de inclusión fueron: artículos revisados por pares publicados entre 2010 y 2024, en inglés o español, y que abordan específicamente el uso de la impresión 3D en contextos de enseñanza artística. Se excluyeron los artículos de opinión, las tesis, los documentos no indexados o aquellos que no tenían una relación directa con el tema principal. Se utilizó un enfoque temático para el análisis cualitativo de los resultados.

2.1.1. Base de datos

Para esta revisión sistemática, se seleccionó Scopus como base de datos de elección. Scopus es una gran base de datos multidisciplinar que

proporciona acceso a información bibliográfica, incluyendo resúmenes y citas. Esta base de datos fue lanzada por la editorial académica Elsevier y sus herramientas ayudan a identificar información relevante, seguir las tendencias de investigación, rastrear nuevas investigaciones publicadas e identificar a expertos en la materia. En este contexto, se eligió la base de datos Scopus por sus altos estándares de calidad editorial, su cobertura multidisciplinaria internacional y su fiabilidad a la hora de obtener publicaciones científicas actualizadas y relevantes. Se reconoce que futuras investigaciones podrían ampliar el alcance de la búsqueda a bases de datos como Web of Science, ERIC o Google Scholar, con el fin de complementar los resultados presentados. Los principales operadores booleanos utilizados fueron: AND y OR, que vinculan los siguientes descriptores: «impresión 3D» O «fabricación aditiva» y arte o educación.

En la primera búsqueda con la fórmula mencionada anteriormente, se obtuvieron 3729 resultados, cuyo año de publicación oscila entre 2005 y 2025. A continuación, la búsqueda se filtró por área temática (limitada a Ciencias Sociales y Artes y Humanidades), por tipo de documento (limitado a artículo) y por idioma (limitado al inglés). Tras esta selección, el número de resultados se redujo a 113, todos ellos con años de publicación comprendidos entre 2013 y 2024. Para obtener resultados aun más precisos, fue necesario excluir otras áreas de investigación con poca relevancia para el tema (Ciencias Agrícolas y Biológicas; Ingeniería Química; Ciencias de la Decisión; Ciencias de

la Tierra y Planetarias; Profesiones Sanitarias; Negocios, Administración y Contabilidad; Economía, Econometría y Finanzas; Ciencias de los Materiales; Psicología; Física y Astronomía; Matemáticas; Química; Odontología; Energía; Ciencias Ambientales; Medicina; Informática; Ingeniería). Tras este último filtro, el total de resultados fue de 26 artículos.

La tabla 1 muestra los resultados de la investigación con las respectivas fórmulas de búsqueda utilizadas, los resultados de la primera selección, los filtros aplicados con los resultados sucesivos y el resultado tras la exclusión de las áreas no relevantes.

Se reconoce que limitar la búsqueda exclusivamente a la base de datos Scopus podría restringir la diversidad de enfoques incluidos en esta revisión. Las investigaciones futuras sugieren incorporar otras bases de datos académicas complementarias, como Web of Science, ERIC o Google Scholar, para mejorar la variedad y la representatividad de las fuentes

2.1.2 Criterios de inclusión y exclusión

Para reducir el considerable número de resultados que arrojó la primera búsqueda, en la siguiente selección se han utilizado criterios de inclusión, que son filtros utilizados en las búsquedas de artículos y que deben cumplir los siguientes requisitos:

- Artículos que relacionen el uso de la impresión 3D con la educación o el arte en el

ámbito de las Artes y las Humanidades o las Ciencias Sociales.

- Artículos científicos
- Documentos en inglés.
- Disponibilidad del texto completo.

Por otro lado, los artículos que cumplan los siguientes criterios no se incluirían en la revisión bibliográfica (criterios de exclusión):

- Artículos relacionados con áreas de investigación distintas de las Ciencias Sociales o las Artes y Humanidades.
- Artículos relacionados con materias distintas a la Educación o el Arte.

Para el presente estudio, solo se ha seleccionado la base de datos Scopus como fuente para extraer los documentos necesarios para el estudio. En la primera fase de «Identificación», se mostraron 3729 entradas. A continuación, se eliminaron los documentos que se marcaron como no aptos mediante la herramienta de automatización, es decir, tras la aplicación de los filtros, se eliminaron 3616 artículos, lo que dio como resultado 113 documentos aptos para su recuperación. En la siguiente fase de «selección», partimos de una base de 113 entradas a las que se aplicaron los criterios de exclusión mencionados anteriormente. Este proceso dio como resultado 10 artículos que se han utilizado para la preparación de este estudio y que cumplen los criterios de inclusión descritos anteriormente (Figura 1).

Table 1: Búsqueda inicial en la base de datos (2005-2025)
Source: Autores (2025)

Base de datos	Fórmula de búsqueda	Número inicial de resultados	Filtros	Número de resultados
Scopus	"«impresión 3D» O «fabricación aditiva» Y arte O educación	3,729	Áreas temáticas limitadas a: Artes y humanidades, Ciencias sociales Tipo de documento: Artículo Idioma: Inglés	113
			Áreas excluidas: A Ciencias agrícolas y biológicas; Ingeniería química; Ciencias de la decisión; Ciencias de la Tierra y planetarias; Profesiones sanitarias; Negocios, administración y contabilidad; Economía, econometría y finanzas; Ciencia de los materiales; Psicología; Física y astronomía; Matemáticas; Química; Odontología; Energía; Ciencias ambientales; Medicina; Informática; Ingeniería	26

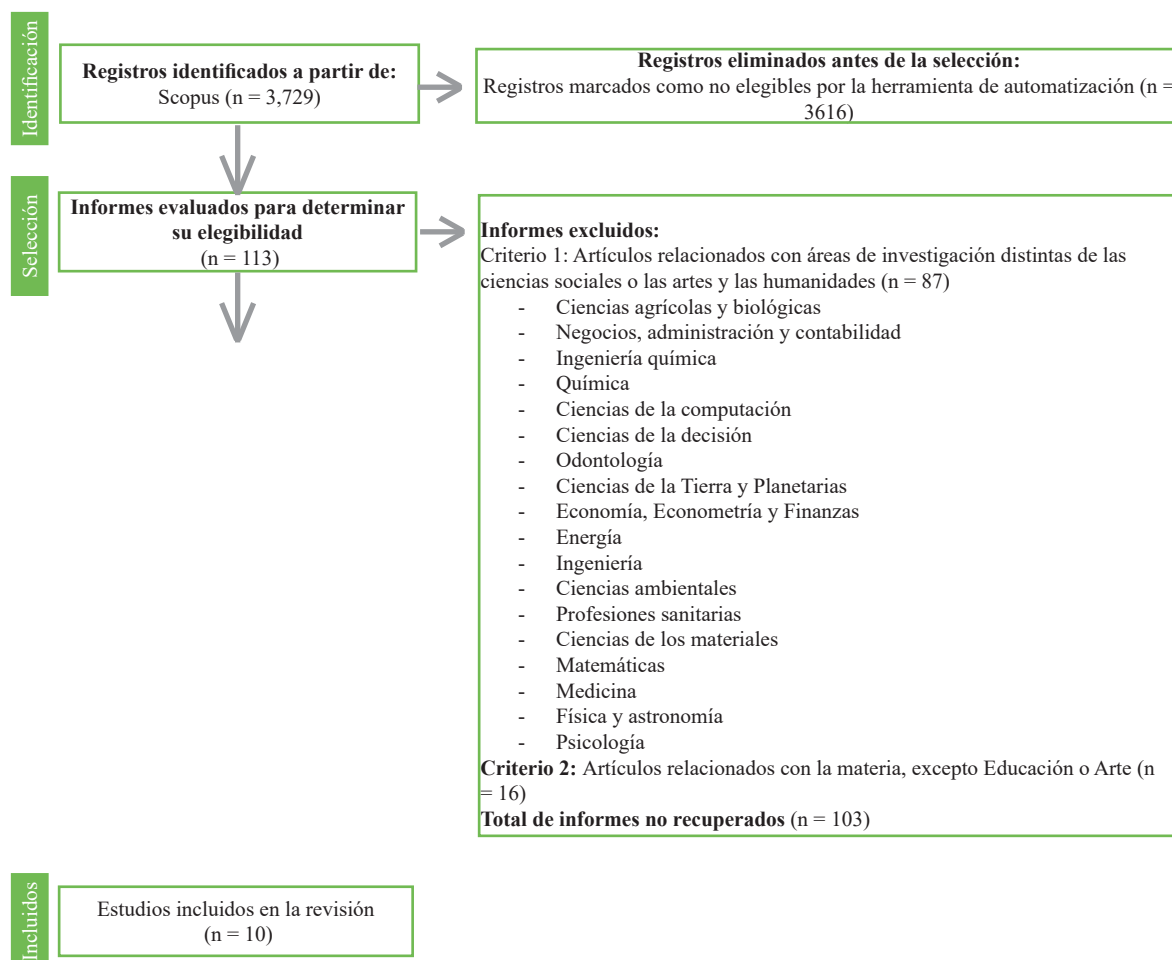


Figura 1: Diagrama de flujo del proceso de selección de registros (2005-2025)
Fuente: Autores (2025).

3. Resultados

En esta sección se muestran las características más relevantes y destacadas de los 10 artículos seleccionados mediante el proceso de selección descrito anteriormente, que constituyen la base de esta revisión sistemática (Tabla 2).

En el proceso de selección se establecieron ciertos criterios que ayudaron a obtener la selección de artículos presentada, cuyo objetivo principal era buscar artículos que identificarán el uso de la impresión 3D en la educación y el arte. Todos los autores parten del elemento clave de la fabricación aditiva y de las utilidades que esta tecnología encuentra en las áreas mencionadas y los beneficios que aporta.

Las fechas de las publicaciones han demostrado que la bibliografía y los estudios existentes sobre esta investigación son muy recientes, de lo que se deduce que el objeto de estudio es actual e importante. Las publicaciones abarcan desde 2017 hasta 2024, y la mayoría de ellas se publicaron a partir de 2021.

En cuanto al contexto educativo, se observaron diferencias en los niveles educativos abordados en los estudios. Algunos artículos se centraron en la educación secundaria, como Malinka et al. (2024), mientras que otros abarcaron tanto la educación secundaria como la superior, como Alhonkoski et al. (2021) y Ye et al. (2020). Jordan et al. (2021) y Horton (2021) trabajaron en el

Tabla 2: Estudios incluidos en la revisión (2005-2025)
Fuente: Autores (2025)

Autores	País	Diseño	Relación con el arte/la educación	Contexto educativo	Conclusiones
Khyzhynskyi et al. (2024)	Ucrania	Revisión exploratoria	Cerámica artística	Público en general y artistas	Este estudio destaca el papel cada vez más importante de las tecnologías aditivas en la cerámica artística, resaltando su potencial para innovar las prácticas tradicionales y apoyar el desarrollo educativo mediante la ampliación del conocimiento de los materiales, las técnicas y las posibilidades creativas de la impresión 3D con cerámica.
Malinka et al. (2024)	República Checa	Enfoque de investigación cuantitativa	Educación, incluida la educación artística	Educación secundaria	El artículo presenta los resultados de dos experimentos que demuestran la alta aceptación de la tecnología 3D por parte de los estudiantes y sus efectos positivos en el rendimiento de estos, y aborda la cuestión de la incorporación de la impresión 3D en el plan de estudios.
Adler (2023)	Estados Unidos	Artículo descriptivo	Autenticidad del arte	Público general	La autenticidad de las obras de arte se pone en tela de juicio ante la posibilidad que ofrece la impresión 3D de realizar copias exactas de los objetos artísticos. Este artículo explora la norma de autenticidad del arte y muestra por qué es esencial comprender tanto el mercado del arte como el fenómeno de los NFT.
Wargo et al. (2022)	Estados Unidos	Estudio de caso	Expresión artística	Profesores en formación	Este artículo ilustra cómo la integración de la impresión 3D con prácticas de alfabetización basadas en las artes puede enriquecer las experiencias educativas, permitiendo a los futuros maestros involucrarse de manera crítica con los textos, explorar cuestiones sociales y ampliar su comprensión a través de la expresión multimodal.
Alhonkoski et al. (2021)	Finlandia	Revisión exploratoria	Educación	Educación secundaria y superior	Esta revisión exploratoria describe el uso de la tecnología 3D para apoyar la enseñanza y el aprendizaje en la educación sanitaria. Los resultados describen efectos positivos en el aprendizaje de los estudiantes en relación con las habilidades, los conocimientos, las percepciones y las emociones de los estudiantes..
Horton (2021)	Estados Unidos	Enfoque de investigación cuantitativo	Accesibilidad al arte	Educación superior y público en general	Este artículo analiza el programa de impresión 3D de una biblioteca académica que se utilizó con fines educativos o de investigación. Los departamentos que más han utilizado la impresora 3D han sido: Ingeniería Mecánica y Procesos Energéticos, Biblioteconomía, Arquitectura, Diseño Industrial, Currículo e Instrucción, Informática, Comunicación de Masas y Artes Audiovisuales y Geología.
Jordan et al. (2021)	Estados Unidos	Enfoque de métodos mixtos	Educación artística	Educación superior	En este trabajo, los espacios de creación móviles como MAKE 3D integran la impresión 3D en la educación artística. A través del aprendizaje interdisciplinario que une el arte, el diseño y la tecnología, MAKE 3D fomenta experiencias cinestésicas que estimulan la expresión artística, la resolución de problemas y las habilidades técnicas, ampliando el acceso a la educación STEAM en contextos diversos y basados en el lugar.
Reilly and Dawson (2021)	Reino Unido	Artículo de investigación	Arte y arqueología	Público general	Este artículo describe las respuestas creativas humanas ante un conjunto superficial (una dispersión) de artefactos líticos mediante el uso de réplicas impresas en 3D con ciertas modificaciones en cuanto a color y escala.
Ye et al. (2020)	China	Revisión sistemática y metaanálisis	Educación	Educación secundaria y superior	La revisión muestra que, en la enseñanza del cuerpo humano mediante modelos impresos en 3D, los resultados de las pruebas no son inferiores a los del grupo de enseñanza convencional. En comparación con el grupo que utilizó cadáveres o modelos en 2D, el grupo que utilizó modelos en 3D obtuvo mejores resultados en las pruebas. En comparación con el grupo convencional, los estudiantes del grupo que utilizaron modelos en 3D obtuvieron una mayor precisión en las pruebas y consideraron que los modelos en 3D eran más útiles.
Turner et al. (2017)	Canadá	Artículo descriptivo - investigación colaborativa	Accesibilidad al artes	Educación primaria y secundaria, museo	Este artículo describe un proyecto de investigación sobre cómo los niños aprenden a imprimir en 3D en un museo, evaluando su comprensión técnica y su interés por la historia cultural de la fabricación de calzado. El uso de tecnologías de impresión 3D en el contexto de los museos fomenta la participación creativa, lo que contribuye al interés y el entusiasmo por los contenidos del museo y las tecnologías digitales.

ámbito de la educación superior, y este último también abarcó a la población general. Wargo et al. (2022) centraron su estudio en los profesores en formación, mientras que Turner et al. (2017) incluyeron tanto la educación primaria como la secundaria en su investigación sobre los museos. Por último, algunos estudios se dirigieron al público en general, como Khyzhynskyi et al. (2024), Adler (2023) y Reilly y Dawson (2021).

Tras el análisis de los artículos seleccionados, el uso de la impresión 3D en la educación aporta múltiples beneficios que han sido demostrados por varios estudios. En el ámbito de la educación artística, se encontraron diversos enfoques temáticos. Algunas investigaciones estudiaron el uso de la impresión 3D en la educación en general, como las de Alhonkoski et al. (2021) y Ye et al. (2020). Otras se centraron específicamente en la educación artística, como las de Malinka et al. (2024) y Jordan et al. (2021) o Wargo et al. (2022), que exploraron la expresión artística en futuros profesores. En cuanto a la accesibilidad al arte, destacan Horton (2021) y Turner et al. (2017). Por otro lado, algunos estudios abordaron el arte desde diferentes perspectivas con una relación indirecta con la educación, como el trabajo de Khyzhynskyi et al. (2024) sobre la enseñanza de la cerámica artística, el estudio de Adler (2023) sobre la autenticidad en el arte y el análisis de Reilly y Dawson (2021) en torno al arte y la arqueología

En cuanto a la incorporación de la impresión 3D en la educación como herramienta pedagógica, autores como Malinka et al. (2024), Wargo et al. (2022), Jordan et al. (2021) y Horton (2021) justifican los grandes beneficios que aporta la impresión 3D. Malinka et al. (2024) presentan una investigación en educación secundaria que resume los beneficios que esta tecnología aporta a la educación, como el aumento de la motivación de los estudiantes, una mayor interactividad y atractivo, la mejora de la observación y la concentración de los estudiantes, la creatividad y la imaginación espacial, y una disminución estadísticamente significativa del aburrimiento de los estudiantes. Este enfoque general también abarca la educación artística. Aparte de las ventajas, también hay ciertos problemas a los que debe enfrentarse el sistema educativo, como

la escasa correspondencia de los materiales existentes con el marco educativo, la falta de un conjunto más amplio de materiales didácticos y el desconocimiento de los profesores, que a menudo lleva a la decisión de no adquirir el equipo.

Wargo et al. (2022) exploran cómo 13 profesores en formación utilizaron la impresión 3D para transformar valores y prácticas socioculturales en artefactos 3D, lo que permitió una construcción de significado que trascendió de lo representativo hacia lo abstracto. El proceso implicó tanto la colaboración en el diseño como la crítica y la exposición de las creaciones, lo que fomentó la reflexión y el compromiso con la educación artística. Por otro lado, Jordan et al. (2021) destacan el potencial de la impresión 3D en la educación artística a través de enfoques interdisciplinarios en proyectos STEAM. Su iniciativa MAKE 3D fusiona el arte, el diseño y las STEM, promoviendo el aprendizaje experiencial y el desarrollo de habilidades en la fabricación digital. Los resultados muestran que la participación en MAKE 3D mejoró la conciencia de la intersección entre el arte y la ingeniería, aunque persistieron las diferencias de interés entre los estudiantes de ambas disciplinas. El estudio subraya que la impresión 3D no solo facilita la experimentación artística, sino que también fomenta la convergencia entre diferentes campos del conocimiento.

Horton (2021) justifica la relevancia de la impresión 3D en el ámbito educativo, sin embargo, opera en el entorno universitario, donde se ha llevado a cabo un proyecto a largo plazo durante el cual se han recopilado y analizado datos en relación con la introducción de impresoras 3D en la biblioteca académica. A través de cursos con créditos, talleres en la biblioteca y eventos de divulgación más tradicionales, se han mejorado los procesos de enseñanza-aprendizaje, ya que las impresoras se han puesto a disposición de toda la comunidad universitaria. Por otra parte, la tecnología también se ha puesto a disposición del público, lo que amplía la colección tecnológica, permite llegar a determinados grupos o comercializar en departamentos específicos. El autor demuestra que la impresión 3D puede contribuir de manera significativa a las necesidades de la enseñanza y la investigación, y muestra el potencial de

expansión en el futuro debido a sus resultados positivos.

Otra área clave desde la perspectiva de la educación artística es el uso de la impresión 3D en museos y contextos patrimoniales, que se observa en múltiples estudios, como los de Turner et al. (2017) y Khyzhynskyi et al. (2024). El estudio de Turner et al. (2017) demostró que, en un espacio museístico, la impresión 3D puede mejorar el entorno de aprendizaje y hacerlo más fructífero. Destaca especialmente las ventajas que tiene la impresión 3D cuando se utiliza como taller dirigido en combinación con herramientas pedagógicas específicas para museos. El autor señala la fusión de las competencias técnicas-digitales y culturales que involucra a los niños con objetos de valor histórico-cultural a través de un proceso de diseño 3D. Los resultados confirman el interés y el entusiasmo tanto por el contenido del museo en el que se llevó a cabo la investigación como por las tecnologías digitales, y subrayan aún más su mejor comprensión.

Khyzhynskyi et al. (2024) exploran el impacto de la impresión 3D en la cerámica artística, destacando su potencial para transformar tanto la enseñanza como la práctica creativa. A diferencia de la impresión con plástico o metal, la cerámica impresa en 3D requiere un proceso adicional de secado y cocción, lo que plantea retos únicos, pero también nuevas posibilidades para los artistas. La precisión de esta tecnología permite crear formas complejas y texturas innovadoras, ampliando los límites del diseño cerámico tradicional. A pesar de algunos problemas técnicos, como la deformación de los modelos antes de la cocción, la investigación destaca el creciente interés por la impresión 3D en arcilla y su integración en la educación artística, incluyendo colaboraciones con artistas y profesores de impresión 3D en cerámica para optimizar sus aplicaciones.

El impacto de la impresión 3D en la autenticidad del arte es un tema clave en algunas investigaciones. Encontramos nuevas posibilidades y contribuciones: Adler (2023) y Reilly y Dawson (2021) son los únicos autores que fueron seleccionados en el proceso de revisión sistemática y que se preocupan por el tema de la impresión 3D en el arte. El estudio de

Reilly y Dawson (2021) destaca las propiedades del material más utilizado en la impresión 3D, el PLA, como la biodegradabilidad y la biocompatibilidad con el cuerpo humano. Crearon proyectos cuyo objetivo era replicar artefactos líticos que se encontraron en un maizal. Estas réplicas se realizaron con ciertas modificaciones en cuanto al color y la escala. Estas son las grandes ventajas de la impresión 3D, que permite replicar artefactos y, para un mejor análisis, ampliarlos e incluso convertirlos en arte mediante modificaciones de color que les añaden un nuevo significado. Los artefactos replicados y modificados se introdujeron en el entorno en el que se encontraron los elementos originales para redescubrirlos y crear nuevos contextos.

Adler (2023) ofrece una perspectiva única sobre el uso de la impresión 3D que cuestiona un área sensible de la autenticidad de las obras. Como se puede ver en el estudio anterior (Reilly y Dawson, 2021), las tecnologías altamente avanzadas pueden reproducir cualquier objeto. Como resultado, las obras de arte y su autenticidad se ven amenazadas por este avance tecnológico. Partiendo de esta preocupación, Adler (2023) advierte sobre la eliminación de la distinción visual entre copias y originales. Se plantean preguntas sobre el valor del arte, sobre si en el futuro todos podremos tener la Mona Lisa en casa y no tendremos que viajar al Louvre para verla.

En cuanto al tema de la educación, hay autores que han estudiado las contribuciones de la impresión 3D en relación con un mejor conocimiento del cuerpo humano, enriqueciendo a los estudiantes en la educación sanitaria (Alhon Koski et al., 2021; Ye et al., 2020). Alhon Koski et al. (2021) utilizan una revisión exploratoria para demostrar los efectos positivos del uso de la impresión 3D. Este estudio de diferentes investigaciones ha demostrado la utilidad de esta tecnología, especialmente en el campo de la enseñanza de la anatomía. Los autores también señalan resultados positivos desde la perspectiva de los resultados del aprendizaje y los resultados que apoyan el aprendizaje, por ejemplo, la motivación de los estudiantes. Destacan los beneficios en múltiples áreas e incluyen la mejora de las habilidades, los conocimientos y las preocupaciones empáticas, lo que está en consonancia con los estudios sobre educación médica.

Del mismo modo, Ye et al. (2020) analizan la utilidad de la impresión 3D, donde se descubrió que los modelos impresos en 3D eran más útiles que los modelos convencionales. Tras analizar los estudios seleccionados en una revisión sistemática, los autores muestran que la mayoría de los estudios confirman que los estudiantes que utilizan la impresión 3D estaban más satisfechos

que el grupo convencional. Solo un artículo no muestra una diferencia estadística entre los dos grupos. El estudio también destaca la rapidez con la que los estudiantes responden a preguntas sobre determinados temas médicos, lo que demuestra que los grupos que utilizaron la impresión 3D tardaron menos tiempo en responder a las preguntas que los grupos convencionales.

4. Discusión

Esta revisión sistemática ha demostrado que el uso de impresoras 3D en la educación artística es beneficioso, ya que se han podido observar sus múltiples aplicaciones en diversos contextos educativos. Smith (2014) y Menano et al. (2019) coinciden en que se ha demostrado que la integración de la impresión 3D en la educación artística fomenta la creatividad, el pensamiento crítico y el aprendizaje activo. Los dos estudios destacan que este proceso, basado en el diseño iterativo, permite a los estudiantes definir criterios, generar soluciones, crear prototipos digitales y recibir comentarios. Los informes también enfatizan que la impresión 3D no sustituye a las técnicas tradicionales, sino que las complementa y amplía las posibilidades creativas. Además, ambos estudios enfatizan el papel fundamental de la formación del profesorado para facilitar la integración efectiva de la impresión 3D en la educación artística, así como la importante contribución de los artistas contemporáneos para inspirar a los estudiantes. Sin embargo, los dos estudios divergen en su enfoque de la implementación. Smith (2014) destaca la necesidad de una estructura curricular claramente definida para que la impresión 3D tenga un impacto significativo en el aprendizaje, mientras que Menano et al. (2019) hacen más hincapié en la colaboración interdisciplinaria como clave para su éxito. Del mismo modo, Menano et al. (2019) destacan además el potencial de la impresión 3D para generar nuevas perspectivas educativas mediante la integración del arte y la tecnología, mientras que Smith se centra más en su aplicación práctica dentro de la educación artística tradicional.

El estudio de Zhang (2024) demuestra cómo la impresión 3D puede mejorar la creatividad y la innovación en la educación artística al facilitar la creación de formas intrincadas que son difíciles de lograr manualmente. Las herramientas digitales como Sculptgl facilitan la experimentación de los estudiantes, la iteración de diseños y la exploración de conceptos novedosos más allá de las limitaciones impuestas por los materiales tradicionales. El estudio también hace hincapié en los beneficios interdisciplinarios de integrar el arte, el diseño y la ingeniería, promoviendo tanto la funcionalidad como la estética. No obstante, Zhang (2024) coincide con Smith (2014) y Menano et al. (2019) en subrayar la necesidad de una formación adecuada del profesorado, una integración sistemática en el plan de estudios y una gestión eficaz de los recursos. Si bien el potencial transformador de la impresión 3D en el ámbito de la educación artística es indiscutible, su éxito depende de la superación de dos retos importantes: el técnico y el pedagógico. Para garantizar un equilibrio armonioso entre las habilidades tradicionales y las digitales, es esencial mantener un enfoque matizado de la integración de la impresión 3D en la educación artística.

Si bien la creatividad y la innovación se han destacado ampliamente como competencias promovidas por el uso de la impresión 3D en contextos de educación artística, la bibliografía revisada también demuestra los beneficios en el desarrollo del pensamiento espacial, la resolución de problemas, la alfabetización digital, el trabajo colaborativo y la planificación de proyectos. Estas

habilidades son fundamentales en el contexto de la educación del siglo XXI, en consonancia con marcos como el de las competencias digitales para docentes (DigCompEdu).

Siguiendo las contribuciones de Assante et al. (2020), el estudio de Chen y Chang (2018) también destaca el potencial de la impresión 3D en la educación artística para estudiantes con discapacidad visual, superando retos como la falta de profesores especializados y de materiales adecuados. A través de entrevistas y la experimentación con el modelo motivacional ARCS (atención, relevancia, confianza y satisfacción), los autores concluyen que la impresión 3D facilita la enseñanza del concepto de espacio en el arte, permitiendo a los estudiantes percibir y crear composiciones con diferentes profundidades (primer plano, plano medio y fondo). La utilización de réplicas en 3D de pinturas de renombre sirvió para estimular la curiosidad y mejorar la comprensión espacial a través de la interacción táctil. Además, el estudio destaca la importancia de fomentar la confianza de los estudiantes en sus habilidades artísticas y facilitar un mayor acceso a los espacios culturales, como museos y galerías, que sirven para enriquecer el aprendizaje y promover el

desarrollo en las artes visuales. Los museos también fueron destacados como áreas clave desde la perspectiva de la educación artística en relación con la impresión 3D por Turner et al. (2017) y Khyzhynskyi et al. (2024).

Además, hay estudios que analizan las ventajas y desventajas del uso de la impresión 3D en la educación artística. El estudio de Meng (2022) examina la integración de la impresión 3D en la educación artística secundaria, destacando su capacidad para mejorar la comprensión espacial, la creatividad y la interacción de los estudiantes con el arte. El modelado virtual permite a los estudiantes navegar por entornos 3D, interactuar con sus obras de arte a través de simulaciones y realidad virtual, y cultivar habilidades de trabajo en equipo. Además, se ha demostrado que el uso de software 3D fomenta la autonomía y la motivación. Sin embargo, el estudio también identifica retos como la posible adicción a la tecnología, el tiempo necesario para aprender a utilizar el software y el riesgo de limitar la creatividad cuando se depende en exceso de las herramientas digitales. Para abordar estas preocupaciones, el autor propone una integración equilibrada de los métodos tradicionales y digitales en la educación artística.

5. Conclusiones

Tras un análisis exhaustivo de los 10 artículos seleccionados, se puede concluir que la impresión 3D, utilizada en diferentes contextos (es decir, escuelas, instituciones educativas, universidades y museos), actúa como una herramienta versátil en el proceso de enseñanza-aprendizaje en la educación artística. Se ha demostrado que esta tecnología puede emplearse para desarrollar habilidades relacionadas con la resolución de problemas, mejorar la comprensión de la materia y estimular la motivación y el interés de los estudiantes por el aprendizaje, fomentando así su compromiso y entusiasmo. También se ha demostrado la utilidad y versatilidad de la impresión 3D en el arte, ya que permite replicar objetos con gran precisión y modificarlos en aspectos como la escala y los colores, dándoles

un nuevo significado. Se ha demostrado que la capacidad de transformar conceptos abstractos en objetos tangibles mejora el razonamiento espacial y la expresión artística, ampliando las perspectivas de los estudiantes sobre el arte y la tecnología. Sin embargo, se han planteado inquietudes y controversias sobre la autenticidad de las obras de arte, que pueden verse cuestionadas por estas tecnologías. La integración exitosa de la impresión 3D en la educación artística depende de la formación adecuada de los maestros, ya que los educadores deben desarrollar las habilidades digitales y pedagógicas necesarias para guiar a los estudiantes de manera eficaz y maximizar el potencial de esta tecnología en el proceso de aprendizaje.

La integración de la impresión 3D en entornos artísticos y educativos ofrece un potencial significativo para enriquecer el aprendizaje y estimular la creatividad. Sin embargo, los estudios revisados revelan varias áreas que requieren mayor atención. No se abordan adecuadamente cuestiones críticas como la posibilidad de su uso con fines bélicos y cómo evitarlo, los problemas de licencia relacionados con la fabricación de réplicas de determinados objetos y la falta de investigación sobre la contribución de la impresión 3D al arte. Tampoco se mencionan los retos técnicos de las impresoras 3D, como la dificultad de imprimir detalles minuciosos, la fabricación de objetos de gran tamaño, los largos tiempos de impresión, la solidez del material o su toxicidad, especialmente relevante cuando el material entra en contacto con niños. Estos factores son las limitaciones que no se

encuentran en los estudios seleccionados y sirven de motivación para seguir investigando. También es necesario profundizar en el tema del arte, ya que no se han realizado suficientes estudios para analizarlo.

La revisión muestra que disciplinas como la escultura, el diseño industrial, la arquitectura y el arte digital son las que más se benefician de la integración de la impresión 3D, debido a su enfoque en la tridimensionalidad y la creación de prototipos. En cuanto a los niveles educativos, el impacto es especialmente significativo en la educación secundaria y superior, donde los estudiantes tienen mayores habilidades técnicas y cognitivas para aprovechar el potencial de estas tecnologías. Sin embargo, también se registran experiencias positivas en los niveles de primaria a través de enfoques adaptativos orientados a la exploración creativa.

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Educational innovation from a transformative and socially-committed perspective

La innovación educativa desde una perspectiva transformadora y de compromiso social

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Educational innovation from a transformative and socially-committed perspective

La innovación educativa desde una perspectiva transformadora y de compromiso social

Abstract

This study examines how the concept of educational innovation is understood in different academic contexts, exploring whether it aligns with a transformative and socially-committed approach for schools or is merely used to justify various types of novel practices. A systematic literature review (SLR) was conducted, analyzing 99 open-access articles published between 2011 and 2022 in Scopus, Dialnet, Web of Science, and Scielo. Through an inductive content analysis, the articles have been organized around four perspectives of educational innovation: techno-digital, techno-didactic, classroom and center innovation, and critical. The conducted analysis suggests that the extent of educational improvements in schools is directly related to the approach to innovation underlying this study. Our findings highlight the fact that transformative innovation remains a minority and is primarily linked to collective improvement proposals that foster participation, democratic engagement, and collaborative reflection among all stakeholders in the educational community.

Keywords: educational innovation, educational improvement, social transformation, social justice, literature review.

Resumen

Este artículo identifica cómo se entiende la innovación en distintas experiencias educativas y si se corresponde con una visión de transformación y compromiso social de los centros, o si utilizan el término para justificar novedades asociadas a las prácticas. Para ello, se presenta una revisión sistemática de la literatura (SLR) de 99 artículos publicados en acceso abierto (2011 – 2022) en Scopus, Dialnet, Web of Science y Scielo. Mediante un análisis de contenido inductivo, los artículos se han organizado en torno a cuatro perspectivas de la innovación educativa: tecnodigital, tecno didáctica, de aula y centro, y crítica. El análisis plantea que el alcance de las mejoras educativas en los centros se relaciona con el enfoque de la innovación planteado en cada artículo. Se concluye que la visión transformadora de la innovación en los centros es minoritaria y se relaciona con propuestas de mejora colectiva que implican la participación, la implicación democrática y la reflexión conjunta de toda la comunidad educativa.

Palabras clave: innovación educativa, mejora educativa, transformación social, justicia social, estudio bibliográfico.

1. Introduction

This article analyzes the construction of discourses on innovation in educational practices in compulsory education centers through a systematic review of the scientific literature. This article is part of the results obtained in the National R&D Project “Resituating Pedagogical Renewal in Spain from a Critical Perspective” (PID2019-108138RB-C21/C22), with which we have contributed to characterizing the term pedagogical renewal (Beneyto-Seoane et al., 2023; De Castro et al., 2024; Díez-Gutiérrez et al., 2023; Feu et al., 2024). During the project’s development, the relevance of conceptualizing the term ‘educational innovation’ has emerged, given the conceptual proximity of the two terms.

Defining the term educational innovation is complex because it is overused, with many hopes for change and improvement in educational centers placed in it (González-Monteaudo, 2020), without discussing the educational meaning of such changes and improvements (Hargreaves & Fink, 2006). We start from the conception of educational innovation as the systematic and somewhat planned incorporation of practices and experiences that transform educational dynamics, cultures, conceptions, and models in order to improve teaching and learning processes, schools, and the educational and social system itself based on parameters of equity, inclusivity, social justice, and the common good (Carbonell, 2015). As Meirieu (2019) argues, “if we really want innovations that help schools progress, the institution must take responsibility. It needs to take a clear stance on its objectives and not be content with turning its tools into totems” (p. 32).

González-Sanmamed et al. (2022) propose four dimensions of innovation that are interrelated in the action and development of educational innovation processes. These are: the theoretical dimension, which establishes different perspectives on which educational innovation is based; the sociopolitical dimension, which proposes that innovation processes are

constructed from the political, socioeconomic, and ideological contexts that legitimize them; the strategic dimension, which proposes that the more complex the innovation, the more it will affect the entire organization of the center; and, finally, the subjective dimension, which takes into account that innovation depends on the interpretations of the people who will carry it out. These dimensions are present in innovations. Therefore, change processes are complex and challenging to sustain in educational organizations.

In recent decades, there has been a constant rise in supposedly innovative pedagogical proposals (Giachi, 2023), often associated with the incorporation of technologies or active methodologies. However, many of these proposals do not question school structures or address the social inequalities that persist in educational centers (Escudero, 2024). As García-Pérez (2018) states, many of these proposals are based on specific, decontextualized, and highly selective studies that do not take into account the educational life of schools and classrooms or the diversity of learning styles. In recent years, banking groups and other private business entities (*Cañadell, 2017) have joined this boom to promote educational success. These discourses highlight the growing relationship between the term ‘innovation’ and ‘results’ and, by extension, accountability. In other words, productivity takes center stage, linked to concepts of effectiveness or efficiency in a competitive environment where the innovative product is what is “sold” as a solution to complex educational problems (Rivas et al., 2019).

Given this scenario, it is necessary to critically analyze the type of innovation being promoted and its objectives (Escudero, 2024). This study proposes to differentiate between innovative experiences that not only bring novelty but also drive structural changes from an inclusive, critical, and democratic participatory perspective of the entire educational community. In other words, the aim is to identify whether educational practices

that are presented as innovative are geared towards educational transformation and social commitment, and whether they are understood as a tool for students to understand the world around them and participate in collective actions as protagonists capable of questioning, reflecting, and contributing solutions to the challenges of their environment (Leach et al., 2024). It is essential to develop a critical perspective in students and encourage them to take an active role in society (Capello et al., 2024; Collet et

al., 2022). Thus, social commitment becomes a central axis, promoting projects that respond to the community’s real needs and strengthen values such as solidarity and justice.

For all these reasons, the question that guides this work is: Which educational innovations, among the experiences analyzed, promote inclusion, democratic participation, and social justice in schools from a perspective of transformation and social commitment?

2. Materials and methods

A systematic literature review (SLR) was conducted on research and publications related to the subject of study: educational innovation in Spain, in accordance with the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews) statement for systematic reviews (Grant & Booth, 2009; Marcos-Pablos & García-Peñalvo, 2018; Page et al., 2021; Petticrew & Roberts, 2006) in order to avoid, or at least minimize, possible biases (Moraga & Cartes-Velásquez, 2015). Peer-reviewed scientific articles based on both quantitative and/or qualitative methodologies, as well as literature review articles and essays, have been analyzed in detail and critically. The method used to compile sources was to search databases for the terms “educational innovation” in Spanish and English (Table 1).

A systematic search was conducted across the reference databases (Scopus, Dialnet, Web of Science, and Scielo) for all publications

between January 2011 and December 2022, using Boolean operators, reviewing emerging publications, and reading and analyzing article content to map the state of the art.

After the first review, in which a total of 53,689 documents were identified in the period analyzed, using the Boolean operators indicated, open-access documents were selected, discarding 30,206 texts, leaving 23,483 in the selection process.

Of these, 11,561 were discarded because they did not refer to experiences or proposals in Spain, and 90 more were discarded because they were from various countries, leaving 11,832 in the selection process. Next, those in the field of education were selected, resulting in 3,317 remaining after discarding 8,515. Finally, those in which at least one of their descriptors included educational innovation were selected, resulting in a total of 1,227 documents.

Table 1: Database search procedure
Source: Own elaboration (2025) .

Database	Keywords	Boolean operators	Search results
SCOPUS	“educational innovation”	AND	14,620
DIALNET	“educational innovation”	AND	17,567
WOS	“educational innovation”	AND	20,937
SCIELO	““educational innovation”	AND	565
TOTAL			53,689

The following filters were applied: a) the articles are open access documents; b) they are in the field of education in Spain; c) the area of knowledge is education; and d) they include educational innovation and educational innovation in their descriptors.

After the initial selection process, the first screening was conducted based on titles and abstracts. Those were discarded in which: a) educational innovation was located in higher education, since we focused on compulsory education stages; b) they did not comprehensively focus on educational innovation, but instead referred to a tangential aspect in the article (tutorial action, educational leadership, role of inspection, emotional well-being of teachers, etc.); c) they were reviews of other publications; d) referred to teacher training; e) were limited to a historical analysis of educational innovations of the past.

Based on these criteria, 1,102 records were excluded. As a result, 125 articles passed the screening filter. From these, duplicate records appearing in several databases were excluded, resulting in the exclusion of 26 articles. Finally, 99 articles were included in this literature review. This process is summarized in Figure 1.

Validation followed the University of York (Centre for Reviews and Dissemination, 2009) criteria: inclusion and exclusion criteria, relevance and suitability, assessment of study quality, data description, timeliness, referentiality, and sufficiency.

The inclusion and exclusion criteria allowed for the selection of a large number of articles that provide evidence of discourse on educational innovation. The relevance and suitability criteria consisted of identifying those studies that met the established filters. The quality assessment and data description criteria focused on the validity and soundness of the research process and the robustness of the data provided.

The criterion of topicality was that this topic has experienced an unusual boom in recent years. Hence, the study corpus covered the period from January 2011 to December 2022, including both

the most significant historical references and the most current experiences. Figure 2 shows the number of articles selected by year of publication. From 2013 onwards, there has been a growing trend in publications on this topic (except for 2014 and 2016), which increased during 2020 and 2021 and decreased in 2022.

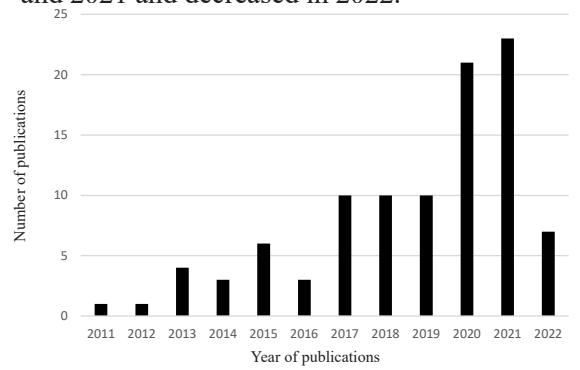


Figure 2: Articles selected according to year of publication.
Source: Own elaboration (2025).

Regarding the criterion of referentiality, it should be noted that the entire corpus of references analyzed consists of articles published in peer-reviewed journals of recognized prestige and impact. Finally, the criterion of sufficiency covers 99 final references, which is sufficient for the scope of the review.

In this article, we have opted for an inductive qualitative content analysis (Mayring, 2015) to identify, organize, and interpret the emerging categories shown in Table 2. This methodological decision is justified by the exploratory nature of the study and the need to understand how the educational innovation experiences analyzed are constructed, described, and oriented.

These categories represent different approaches to innovation based on the changes they generate in educational practices. Among them, the critical approach is distinguished by its commitment to inclusion, democratic participation, and social justice. This approach promotes profound transformations in institutional practices, conceptions, and cultures in order to empower children and young people to actively participate in society and make sense of the world around them.

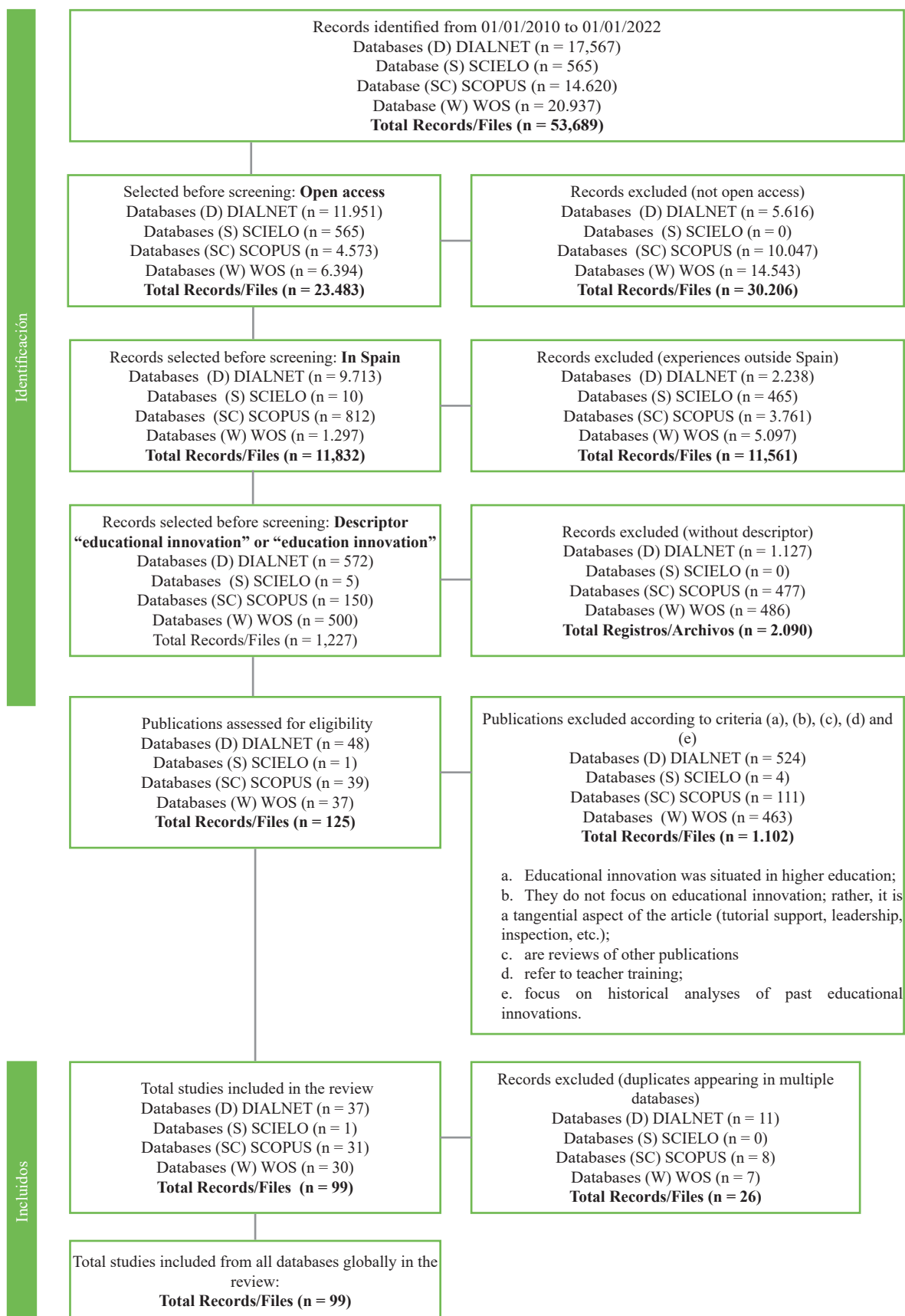


Figure 1: Prisma flow chart adapted from Page et al. (2021).
Source: Own elaboration (2025).

Table 2: Categorization
Source: Own elaboration (2025) .

Category	Definition
1. Technological solutions	The change focuses on the introduction of ICT resources in schools as a key element of innovation.
2. Technodidactics	The change focuses on the introduction of innovative methodological strategies that have an impact on student motivation as a priority element of innovation.
3. Classroom and school	In the classroom, the change is aimed at introducing strategies that have an impact on the organization and acquisition of curricular content as a priority element of innovation. However, in the school context, the change is aimed at introducing proposals that have an impact on the factors that drive or limit innovation.
4. Criticism	Change focuses on the introduction of school proposals that are developed according to educational principles of inclusion and equity, democratic participation, and social justice.

3. Results and discussion

The articles reviewed show that the concept of educational innovation is linked to the term ‘novelty’. We highlight the recurrent use of the word innovation to describe novelties presented as changes or improvements, which, in many cases, are not related to transformative experiences in educational cultures, models, and dynamics whose purpose is to improve teaching and learning processes, schools, and the educational and social system itself.

The results obtained in the categorical analysis of the four approaches analyzed in terms of educational innovation in schools are presented below: (a) articles that describe educational experiences with a vision of educational innovation linked to technological solutions, (b) articles that propose ideas based on a concept of technological innovation in teaching, (c) articles that analyze the impact of innovative strategies in the classroom and in schools, and (d) articles that analyze the concept of educational innovation from a critical and transformative perspective.

3.1. Technological and digital innovation

Firstly, it should be noted that nine of the articles relate innovation to the introduction of technological devices in education (*Area et al., 2020). The discourse focuses on the possibility of changing the way we teach through the integration of technological resources that are

treated as novelties and that modify teaching and learning processes by simply being incorporated into the classroom.

This vision of educational innovation is reflected in articles published between 2011 and 2016 that describe the integration of ICT into educational processes through state programs that provide resources in schools, such as the Escuela 2.0 Program (Del Moral et al., 2014; Santiago-Campion et al., 2014). There are also critical analyses that affirm the limited impact of these technological innovations on teaching and learning processes (*Machado-Trujillo, 2020; *Pérez et al., 2011).

The articles in this approach show that technology, without a critical pedagogical vision that is democratically negotiated and shared by the community, has no possibility of transforming education, nor does it have a clear social commitment. According to *Pardo and San Martín (2020), a reductionist, and in a way “empty,” concept of educational innovation is used, limited to practices carried out with digital devices. *Sosa-Díaz et al. (2022) conclude that most research studies on ICT integration are too biased and focus on the influence of specific characteristics of the ICT integration process, overlooking the systemic nature of the phenomenon.

3.2 . Technodidactic innovation

A total of 28 articles reviewed associate educational innovation with novel, motivating, and gamified teaching-learning resources to enhance motivation and participation, recognizing that these characteristics facilitate learning and the achievement of educational objectives. These aim to propose new teaching and learning strategies, often expressed in Anglo-Saxon terms such as *flipped classroom*, *adaptative learning*, *smart classroom*, *learning ecologies o gamification*.

Articles that focus on the digitization of educational activities present it as an educational innovation because it promotes new ways of organizing student learning: ICTs “have brought about a real revolution in the field of education, causing structural changes in the way we teach and learn” (*Herrada and Baños, 2018, p. 16). When analyzing the proposed digital use, it is strategies such as gamification, robotics, and augmented reality, among others, that trigger an increase in motivation, participation, commitment, autonomy, leadership, etc. on the part of students (*Leal, 2020; *López-Núñez et al., 2020), and in other cases, the ease with which communicative proposals among students can be revitalized is valued. Articles on this approach argue that teachers’ decisions in promoting and revitalizing these digital resources are key to developing new forms of learning.

However, it should be noted that in some of these articles, the digital resources analyzed do not account for significant changes in the configuration of educational practices, dynamics, and actions (*Del-Cerro and Morales-Méndez, 2017; *Mayor and Rodríguez, 2016; *Prendes and Cerdán, 2021). As analyzed by *Machado-Trujillo (2020), it is necessary to recognize that many of the fundamental questions surrounding education and teaching technologies are not technical questions per se. Instead, they are related to broader questions about what education is and what it aims to be.

The approach taken in these articles highlights the notion of educational innovation proposed by Solé:

Educational innovation (...) appears as the lever for reforms that will enable overcoming the limitations of the education currently offered by most schools, colleges, and universities. Imbued with a strong entrepreneurial spirit, innovation is linked to success, although it does not always imply improvement, especially in the educational context (2020, p. 103).

The articles in this section propose technological solutions related to teaching innovations that are decontextualized from the educational project and the transformative perspective of education. Likewise, in many cases, they are justified by quasi-experimental descriptive, correlational, or pre-test-post-test research (*Hinojo-Lucena et al., 2020; *Marín-Marín et al., 2020; *Parra-González et al., 2020; *(Pozo-Sánchez et al., 2020) that collect data from school experiences, whose contributions focus mainly on student motivation and teacher-student interaction.

3.3. Classroom and school innovation

A total of 44 articles take an analytical approach to innovation; 22 focus on proposals that incorporate teaching changes in the classroom, and these changes are perceived as improvements in the educational cycles and stages in which they have been carried out, and 22 articles focus on the factors involved in the processes of implementing educational innovations in schools.

Firstly, classroom educational experiences have been identified as innovative and may involve a specific group of teachers and students or be part of the school. In some cases, the relationship between this experience and the environment is described (*Casals-Ibáñez, 2015; *Fabregat-Pitarch and Gallardo-Fernández, 2015; *Gallardo-López and Muñoz, 2021; *Latorre and Mérida, 2019; *Neira-Piñeiro and Del Moral-Pérez, 2021; *Perales and Vilchez-González, 2015). Others are articles that propose school change through functional teaching methodologies that seek to improve the teaching process for learning content in the area of application of the proposal (*Alcaraz-Domínguez and Barajas, 2021a and 2021b; *Antón and Sánchez, 2020; *(Nielsen et al., 2020). They are valued as teaching innovations that improve teaching and learning processes, focused on learning curricular content, but decontextualized from the school’s educational project.

Nor do they promote an individual or collective view of commitment to the community, democratic participation, or social transformation (*Riera-Jaume et al., 2022). *Marcelo (2013, p. 29) suggests three dimensions when promoting profound educational innovation processes: “the professional who innovates, that is, the teacher, the innovation itself, and the context of the innovation.” Although these articles analyze aspects of the teacher and of innovation itself, the dimension of innovation’s context is absent.

Any improvement in strategies and the pedagogical process to develop learning and teaching that is closer to students’ contexts, more motivating, and more participatory is undoubtedly an essential contribution to the educational process. The problem lies in the fact that these innovations are not conceived as systemic changes that question the organization of teaching and learning processes in the school, nor do they promote a critical perspective among students about the world around them (Leach et al., 2024).

Secondly, 22 articles are compiled that address various factors related to the center’s educational experience. These share a vision of innovation focused on internal areas that need improvement, as proposed by Pérez and Gutiérrez (2020). These articles highlight key elements of strategies for implementing methodological innovations such as cooperative work in the classroom, service learning in the social environment, and civic education for global citizenship (*Bugallo-Rodríguez and Naya-Riveiro, 2018; *(Coma et al., 2022), to make them sustainable in the school (Pulido, 2020).

They propose reflection processes for teaching teams to improve educational practice (*Brevis-Yéber et al., 2022; *(Parrilla et al., 2018), as well as elements that enable educational innovation in schools, such as teacher involvement (*Álvarez-Álvarez and Vejo-Sainz, 2017), the role of the management team in relation to distributed leadership, and the importance of the teacher improvement process (*Barba-Martin et al., 2015). Barriers to innovation include sustainability challenges, such as resistance from some teachers, time investment, and

institutional difficulties, as well as feelings of isolation, stress, and a teacher-training approach focused on the transfer of information (*Martínez-Maireles et al., 2022). Most of these articles do not consider changes in teaching culture or commitment to cultural, personal, and social transformation as key elements of educational innovation (*Pericacho and Andrés-Candelas, 2018). In addition, these 22 articles include some interpretive research (*Álvarez-Álvarez and Vejo-Sainz, 2017; *(Trujillo et al., 2020) that show the factors present in school innovations from an inclusive and critical approach, with the democratic participation of the educational community (*López-Yáñez and Sánchez-Moreno, 2021). However, proposals for transforming institutional culture from a social justice and equity perspective, with a genuine commitment to the environment and social issues, are difficult to identify.

3.4. Critical innovation

The 18 articles included in this last section offer a critical view of educational innovation, with a focus on global transformation (*Area and Adell, 2021; *Machado-Trujillo, 2020; *Montanero-Fernández, 2019; *Pascual, 2019; *Solé, 2020; *Trujillo et al., 2020). In fact, Del Río-Fernández (2023) states that the mere modernization of schools has nothing to do with innovation.

*Martínez and Jolouch (2019) assert that educational innovations such as carrying out projects, working cooperatively, designing learning environments, or introducing digital tools, among other experiences, will not in themselves contribute to truly transforming the educational system or improving the social system, or even the system and culture of the center towards a model of greater equity and social and environmental justice, if such innovation is not adopted with a focus on social transformation from its conception and design.

The articles analyzed agree that an innovative, critical, and transformative process is only possible if it is carried out in a radically democratic manner with the participation of the entire educational and social community involved in the school and, as far as possible, with

other schools in the area, creating collaborative networks (*López-Yáñez and Sánchez-Moreno, 2021). Therefore, they understand that it must be subject to constant critical evaluation.

In this section, the critical perspective on innovation does not present innovation as processes of quality and excellence taken out of context. Instead, it includes proposals that promote critical citizenship based on reflection and analysis, democratic participation, and decision-making by students in collaboration

with other members of the community (*Coma et al., 2022). Such approaches require educational policies that enable a context that supports and accompanies innovation in schools and that do not place the responsibility for innovation on teachers in the absence of the means and resources for an education that leaves no one behind (*Parrilla et al., 2018). In short, this perspective underscores the importance of a critical perspective linked to educational and social transformation to move towards a school and society more committed to inclusion and social justice.

4. Conclusions

After reviewing the 99 selected articles, we can affirm that, for the most part, when discussing innovation, words such as change, transformation, and improvement are used as synonyms without explicitly stating the goals toward which change and improvement are intended (Hargreaves & Fink, 2006). When it comes to putting this innovation into practice, there are multiple experiences that, in the classroom context, focus mainly on technical and methodological aspects and, in the school context, on analytical elements that can be improved to ensure the sustainability of innovations. However, these experiences of innovation are not contextualized within an approach grounded in a commitment to social transformation and a critical perspective on educational emancipation

Articles with a techno-digital approach to innovation base the integration of ICT in education on technological solutions (Mozorov, 2016) to improve educational processes. The integration of ICT is reduced to what Adell (2018) calls a technocentric or instrumentalist view of technology's impact on education. Articles analyzing the second category, techno-didactic innovations, focus on the digital use of platforms, telematic services, and devices that alter relationships and socialization, production, consumption, dissemination, and access to

culture and knowledge (Cobo, 2019). It is worth noting the influence and power of companies, publishers, private banks, etc., which see opportunities to control this “educational change” by creating digital educational content for a new market (Gómez-Torres, 2022). The articles in the third category, classroom and school innovations, collect educational practices and experiences with pedagogical value, but do not question the existing school grammar (Tyack & Tobin, 2001). In other words, they do not change the way educational activities are organized, the perspective of school knowledge, the division of the timetable, or the school spaces.

Although it is possible to conclude that the articles corresponding to the first three approaches to innovation show impacts on progressively broader and systemic educational dimensions, they do not incorporate the critical perspective present in the works of the fourth approach. These works warn that not every experience of change implemented by schools constitutes, in itself, an educational innovation (Hernández, 2017). Consequently, it is essential to reflect on how the objectives of innovation entail commitments to social and educational transformation, the common good, inclusion, and the effective democratic participation of the entire community.

From this perspective, it can be said that proposals focused exclusively on the incorporation of technology or the application of new teaching methods do not contribute substantially to social transformation or the strengthening of a critical and committed citizenry (Collet et al., 2022; Leach et al., 2024). On the contrary, only those innovative experiences conceived as a collective, contextualized process of transformation, aligned with the principles of inclusion, equity, and participatory democracy, can guarantee the right to quality education for all people, without distinction (Capello et al., 2024)

Based on the study's results, we hypothesize that educational innovations with a critical approach and social commitment generate more profound, more sustainable impacts than those focused solely on methodology or technology. Therefore, we point to sustainability as a complementary factor for educational innovations to endure (Hargreaves & Fink, 2006). Although they may emerge with relative ease, to take root, they need to overcome threats such as a lack of resources, disappointment, internal team crises, or a lack of recognition (Stenhouse, 1984). We also highlight the need for a reflective attitude among the members of the community, the ability to make informed and committed decisions, the active participation of the management team in order

to assume shared and distributed leadership, and teacher training that includes critical reflection on educational practices (*García-Gómez and Escudero, 2021; *García-Gómez and Salas-Martínez, 2021). Future research could also explore how to build innovation ecosystems capable of establishing synergies within and beyond schools (Escudero, 2024), as well as assessment models and procedures aligned with transformative proposals and the integration of digital resources into a critical pedagogical approach (Adell, 2018).

Following the systematic review, we can conclude that the approach to innovation based on a successful narrative of novelty and modernity—adapted to the demands of the future market—when integrated into the classroom and centers, is valued as an experience with improved results. However, these successes are limited to technological or educational changes themselves. On the contrary, those experiences that propose educational changes based on collective improvement present innovation as a more complex process of participation and democratic involvement of the entire educational community. These initiatives arise from shared reflection, adopt a critical perspective, and seek to transform the school toward a more inclusive, ecological, and fair horizon of emancipation.

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Stigma toward mental disorders in university students of health sciences

Estigma hacia los trastornos mentales en estudiantes universitarios de ciencias de la salud

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Stigma toward mental disorders in university students of health sciences

Estigma hacia los trastornos mentales en estudiantes universitarios de ciencias de la salud

Abstract

Stigma towards mental disorders is a problem that has a very negative impact on the lives of those who suffer from psychological problems, especially when it comes from healthcare professionals. Objective: To determine the main variables associated with stigma in future healthcare professionals. Methodology: 1,125 university students from different healthcare degrees at the University of Granada participated and voluntarily completed the Attribution Questionnaire (AQ-27) by Corrigan et al. (2003). Results: Variables such as direct experience with mental illness (contact with people with mental disorders and suffering from a mental disorder), receiving training on the subject and interest in this specialization, are related to more positive attitudes towards mental disorders. Women presented less stigmatizing attitudes than men. Conclusions: These data support measures such as promoting direct contact of health students with patients with mental health problems to foster less stigmatizing attitudes.

Keywords: stigma, mental disorders, healthcare students, mental health.

Resumen

El estigma hacia los trastornos mentales es un problema que impacta muy negativamente en la vida de quienes sufren problemas psicológicos, en especial, cuando éste proviene de los profesionales de la salud. Objetivo: comprobar cuáles son las principales variables asociadas al estigma en futuros profesionales de la salud. Metodología: Participaron 1,125 estudiantes universitarios de diferentes grados de ciencias de la salud de la Universidad de Granada, que cumplieron voluntariamente el Attribution Questionnaire (AQ-27) de Corrigan et al. (2003). Resultados: variables como la experiencia directa con la enfermedad mental (contacto con personas con trastornos mentales y sufrir un trastorno mental), recibir formación al respecto e interés por esta especialización, se relacionan con actitudes más positivas hacia los trastornos mentales. Las mujeres presentaron actitudes menos estigmatizantes que los hombres. Conclusiones: estos datos apoyan medidas como promover el contacto directo de los estudiantes de ciencias de la salud con pacientes con problemas de salud mental para favorecer actitudes menos estigmatizantes.

Palabras clave: estigma, trastornos mentales, estudiantes de la salud, salud mental.

1. Introduction

Suffering from a mental disorder can be a challenging process for those who experience it, whether due to the problems associated with the symptoms, the difficulties involved in recovery, or the risk of future relapses. One of the obstacles to overcome when suffering from a mental disorder is the stigma associated with mental health problems, which is a barrier that countless people must face in order to achieve an optimal quality of life (Carrara et al., 2019).

The term “stigma” was defined several decades ago by Goffman (1963) as a “deeply discrediting attribute” that alienates a person from others and can even lead to them not being perceived as a human being at all. More recently, and in relation to mental disorders, Corrigan and Shapiro (2010) define it as the combination of stereotypes or beliefs together with prejudices or negative attitudes, these attitudes being what generate discrimination against people with mental health problems. They also differentiate between public stigma, perpetrated by the population or society, institutional stigma, carried out through government policies and private organizations, and self-stigma, which involves the internalization of stigma by the person suffering from it (Corrigan et al., 2004).

According to Corrigan et al. (2003), when we think that the person suffering from the disorder can “control” it and that it is dangerous, we attribute responsibility for suffering from it to them and generate negative emotions, thus leading to discriminatory behavior. Conversely, when we consider that the person has no control over their disorder or that it is not dangerous, we do not hold them responsible for it. We generate more positive emotions towards them, leading to helpful or supportive behaviors. All of this implies a series of direct and indirect relationships between all these constructs, a process exemplified in Figure 1.

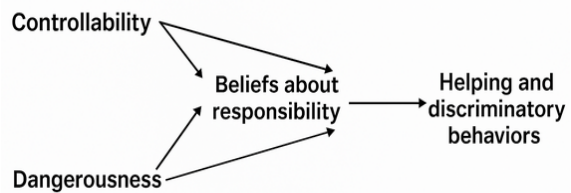


Figure 1: Attribution and Danger Assessment Processes in EHTM.
Source: Corrigan et al. (2003)

The study of stigma toward mental disorders (EHTM) is especially relevant if we consider the impact it has on the lives of those suffering from mental health problems. Some of these repercussions include shame, isolation, low self-esteem, or social and occupational dysfunction in those suffering from mental disorders; or rejection, discrimination, and perceptions of irrationality, irresponsibility, and violent behavior toward them (Dubreucq et al., 2021; Grover et al., 2020; Kong et al., 2020). Negative attitudes toward mental health problems impair the well-being and recovery of those who suffer from them (Ben et al., 2021). It is worth noting that negative attitudes are particularly significant in cases of schizophrenia, which is the most stigmatized diagnosis across various studies (Valery & Prouteau, 2020). In contrast, other disorders such as depression, generalized anxiety, or OCD are perceived more favorably (Hazell et al., 2022).

One might expect EHTM to be a problem limited to the general population, but the truth is that it is pretty widespread within the healthcare sector (Da Silva et al., 2020; Mannarini et al., 2020; Oliveira et al., 2020; Zamorano et al., 2023). Although stigma in this group is less than in the population not working in the healthcare sector, several studies have found stigmatizing attitudes among healthcare professionals toward people with mental disorders: negative emotions, pessimistic thoughts about the usefulness of therapy and the chronicity of their problems, or perceptions of disability and low autonomy toward them (Valery & Prouteau, 2020; Zamorano et al., 2023). More

negative attitudes have also been found toward psychological disorders than toward other medical conditions (Stone et al., 2019).

It should be noted that healthcare professionals are “victims” of the stigma associated with their patients with mental disorders, which has been linked to poorer quality of care, increased risk of burnout, or the desire to change healthcare specialties (Njaka et al., 2023). This implies that EHTM could lead to inadequate care in the health sector (Grover et al., 2020), reducing treatment options, decreasing the potential for recovery of these patients, and even hindering their social integration (Carrara et al., 2019; Economou et al., 2020).

Some of the main variables that have been negatively associated with healthcare professionals’ stigma towards mental disorders are direct contact with someone suffering from a mental disorder, having suffered from one, or having received or not received training on the subject (Giralt Palou et al., 2023), as well as gender, with mixed results that mainly suggest that women have better attitudes toward mental disorders than men (Atienza-Carbonell et al., 2023; Zamorano et al., 2023). Several studies have also highlighted the inverse relationship between knowledge about mental disorders and stigma towards them (Sari & Yuliastuti, 2018; Shahif et al., 2019; Zitoun et al., 2021).

The negative attitudes of healthcare professionals toward mental disorders are such a significant problem that various programs have been created to reduce them. Most of these programs address the factors mentioned above, such as training and education in mental health, as well as direct and indirect contact with individuals who suffer from mental health problems (Atienza-Carbonell et al., 2023; Carrara et al., 2021). Other authors, such as Stone et al. (2019), propose that interventions should be tailored to each specific group of healthcare professionals, addressing issues such as biases, work stressors, and communication skills.

We can conclude that MHBI is a process of particular interest to any health professional, given the negative impact it has not only on

patients with mental health problems and the care they receive, but also on the professionals themselves.

Based on the above information, and on the fact that previous research in other countries has found negative attitudes toward mental disorders among students in health-related fields (Fletcher et al., 2020; Janoušková et al., 2021), we propose the need to study this phenomenon in university students of health sciences, as they will be the professionals who may (or may not) show stigma towards mental disorders in the future, with all the repercussions that this entails.

Thus, our primary objective has been to investigate the potential relationship between various variables (e.g., gender, direct experience with mental disorders, receipt of specific treatment for mental health problems, knowledge/training in this area, and the desire to specialize in this field of health) and EHTM. We were also interested in finding out which mental health disorders are most stigmatized and which are least stigmatized by health science students.

The hypotheses proposed in this research were as follows:

1. Women will have more positive attitudes toward mental disorders than men.
2. Direct contact or coexistence with people suffering from mental disorders will be negatively related to EHTM.
3. Having suffered from a mental disorder will be negatively related to EHTM.
4. Having received professional help will be negatively related to EHTM.
5. Having training in mental disorders will be negatively related to EHTM.
6. Students interested in specializing in mental health will have more positive attitudes than those who are not interested in it.
7. The mental disorder associated with the most negative attitudes will be schizophrenia, and the mental disorders associated with the least negative attitudes will be depression and anxiety

2. Materials and methods

2.1. Sample

The study sample consisted of 1,125 health science students (also known as healthcare students) from the University of Granada (873 women -77.7%- and 242 men -21.5%- and six non-binary people -.5%-). Specifically: Psychology (n=246; 21.9%), Speech Therapy (n=164; 14.6%), Nursing (n=114; 10.1%), Physical Therapy (n=85; 7.6%), Occupational Therapy (n=109; 9.7%), and Medicine (n=407; 36.2%). Initially, 1,171 people participated in the research; however, 46 were excluded because they had left several questions on the AQ-27 unanswered or had not signed the informed consent form. The average age of the participants was 20.85 years (SD = 4.11).

82.1% of participants had had direct contact with people with mental illness (the type of relationship is shown in Table 1), and 14.3% currently live with people with mental illness. Twenty-seven point six percent had suffered from a mental disorder (the type of disorder is shown in Table 1). Of these, sixty-seven point five percent had received professional help for their mental health problem.

Seventy-three point five percent have received training in mental health, and 59.3% would like to specialize in this field (Table 1).

All students in the sample read the study information sheet and provided their informed consent before completing the assessment instruments, agreeing to the use of their data for research purposes. This protocol was previously approved by the Human Research Ethics Committee of the University of Granada (reference code 3130/CEIH/2023) and carried out in accordance with the Declaration of Helsinki (World Medical Association, 2015).

Table 1: Characteristics of the sample related to stigma.
Source: Own elaboration (2025)

Tipo de relación	n = 924	%
Father/Mother	95	10,3
Other family member	213	23,1
Partner	49	5,3
Friend	273	29,6
Companion	13	1,4
Other people	278	30,2
Diagnosis	n = 813	%
Anxiety	123	39,9
Depression	63	20,5
Anxiety and depression	39	12,7
Eating disorder (ED)	38	12,3
Post-Traumatic Stress Disorder	6	1,9
Anxiety and Eating Disorders	6	1,9
Education (location/type)	n = 825	%
University degree	339	40,7
Self-taught	153	18,4
Courses	11	1,3
Internships	2	,2
Volunteering	5	,6
Miscellaneous	322	38,7

2.2. Instruments

Two questionnaires were used to carry out this research: one to collect sociodemographic variables and another to assess EHTM, specifically the Attribution Questionnaire (Corrigan et al., 2003). Both were presented in paper format, in the classroom, during class time.

The sociodemographic questionnaire, which was developed in-house, collected the following variables: age, gender, grade, and course; direct contact with someone who has a mental disorder and type of relationship; current cohabitation with someone suffering from a mental disorder; having suffered from a mental disorder, when, diagnosis, and whether professional help was received; whether training on the subject was received and where; interest in specializing in mental health: disorder considered most dangerous and disorder considered least dangerous.

The Attribution Questionnaire (AQ-27; Corrigan et al., 2003) is an EHTM measurement instrument that has been adapted and validated in Spain by Muñoz et al. (2009, 2015). It consists of 27 items. It encompasses nine dimensions based on the theoretical proposal by Corrigan et al. (2003), comprising attributions, emotions, and behaviors: Responsibility and Dangerousness (cognitive); Anger, Fear, and Pity (emotional); and Coercion, Segregation, Avoidance, and Help (behavioral). Each dimension consists of three items in a Likert scale format with nine response options (where one means “Not at all” and nine means “Very much”). (Therefore, the score for each dimension ranges from 3 points—the lowest score—to 27 points—the highest score).

The AQ-27 presents a hypothetical situation involving a person (José) who has a mental disorder, to which the person being assessed responds to a series of questions relating to the above dimensions (e.g., “I would feel sorry for José,” “To what extent do you think the cause of José’s current situation is controllable?”). Depending on the dimension, high scores will indicate positive (Help and Compassion) or negative (Responsibility, Danger, Anger, Fear, Coercion, Segregation, and Avoidance) attitudes toward mental disorders. The Spanish version of the AQ-27 has been demonstrated to be an instrument with acceptable psychometric properties, as indicated by a Cronbach’s alpha of 0.76 (Muñoz et al., 2015).

2.3. Procedure

This research was conducted at the University of Granada (Spain) during the 2022/23 academic year. To access the sample, faculty members teaching health science degrees at the University of Granada were contacted via email and informed of the study’s objectives and characteristics. After confirmation from the teachers, who permitted us to access their class time, their participation was scheduled in agreement with them: a face-to-face assessment session held during one of their classes. This is therefore a non-probabilistic sample.

The evaluation was conducted consistently for all study participants. Before distributing the questionnaires, it was emphasized in each class that participation was entirely voluntary and anonymous and that it would not affect their grades in any way. This information was included in the written informed consent form that participants had to sign.

The inclusion criteria were:

- Being a university student in one of the following health science degrees at the University of Granada: Psychology, Speech Therapy, Nursing, Physical Therapy, Occupational Therapy, and Medicine.
- Agreeing to participate voluntarily, without any compensation.
- Signing the informed consent form.
- Completing all items on the AQ-27 questionnaire.

Students who did not wish to participate were asked not to hand in their completed questionnaires at the end of the session.

2.4. Data Analysis

To analyze the data, we used the IBM Statistical Package for the Social Sciences (SPSS) version 20.0. First, a descriptive analysis was performed (mean, SD, and in some variables, percentages—most dangerous and least dangerous disorder) of the sociodemographic characteristics of the sample and the variables related to stigma. We then performed the relevant analyses to identify significant differences. Given that the variables studied met the criteria of normality and homoscedasticity (homogeneity of variances), the statistical analyses were performed using parametric analyses.

Specifically, and given that the independent variables analyzed had two levels, in order to check whether there were significant differences in the dependent variables (scores on the different dimensions of the AQ-27 questionnaire) based on the independent variables (gender, direct contact or coexistence with mental illness, having suffered

from mental illness, receiving professional treatment, having training in mental health, and having an interest in this type of specialization), different Student's t-tests for independent samples were performed. A significance level of $p < 0.05$ was chosen.

3. Results

The first thing we analyzed was the mean scores for the dimensions evaluated by the AQ-27. The highest mean scores were observed in Help ($M = 23.59$; $SD = 3.37$) and Pity ($M = 18.37$; $SD = 3.95$) and the lowest mean scores were in the dimensions of Anger ($M = 8.17$; $SD = 3.89$), Responsibility ($M = 8.57$; $SD = 3.31$), Segregation ($M = 9.04$; $SD = 4.84$), and Fear ($M = 9.08$; $SD = 5.01$).

Secondly, we analyzed the percentage of students in each of the independent variables: 82.1% of participants had direct contact with someone suffering from a mental disorder, and within this group, the percentage of students who had a relationship with several people (30.2%), with a friend (29.6%), or with a non-direct family member (23.1%) stood out. Living with someone who suffers from a disorder is not as common, occurring in 14.3% of cases.

27.6% of the sample has suffered from a mental disorder, mainly anxiety (39.9% of diagnoses) and depression (20.5%). In two-thirds of these cases (67.5%), participants who suffered from a disorder received psychological help.

Seventy-three point five percent of the sample had received training on mental disorders, mainly during their studies (40.7%) or through various means (during their degree, self-taught; 38.7%). It is also worth noting that 59.3% of health sciences students express interest in specializing in mental health.

After analyzing the gender variable, we found that women exhibit less stigma than men in the

dimensions of responsibility, help, and avoidance (t-values ranging from 2.41 to -5.87 and p-values ranging from .03 to .016) (Table 2).

Concerning the other variables analyzed, as we can see in Table 3, we found a significant negative relationship between EHTM and:

- having had direct contact in 7/9 dimensions (t from 2.53 to 3.86 and p from .000 to .012), i.e., lower scores, which means less stigma in the dimensions of responsibility, anger, dangerousness, fear, segregation, and avoidance.
- currently living with a person with mental illness in 5/9 dimensions (t from 2.52 to 4.48 and p from .000 to .012), i.e., lower scores, which means less stigma in the dimensions of anger, dangerousness, fear, and avoidance, and
- suffering or having suffered from a mental disorder in 5/9 dimensions (t from 2.02 to 3.90 and p from .000 to .044); that is, lower scores, which means less stigma in the dimensions of dangerousness, segregation, fear, and avoidance.
- Having received professional help did not show any significant relationship with the EHTM.

In Table 4, we observe a significant negative relationship between EHTM and specialized training in mental health in 7 out of 9 dimensions (t-ranges from 2.08 to 4.93 and p-ranges from .000 to .038), as well as interest in specializing in mental health in 7 out of 9 dimensions (t-ranges from 3.92 to 7.72 and p-ranges from .000).

Table 2: Mean (M), Standard Deviation (SD), Student's t (t), and significance level (p) in the dimensions of the AQ-27 Questionnaire: Differences based on gender.
Source: Own elaboration (2025)

Dimensiones	Total Sample	Gender ¹		t	p
		Male	Male		
	M (DT)	M (DT)	M (DT)		
Responsibility	8,57 (3,31)	9,03 (3,46)	8,46 (3,26)	2,41	,016*
Mercy	18,37 (3,95)	18,07 (3,26)	18,45 (3,92)	-1,32	,188
Anger	8,17 (3,89)	8,49 (4,08)	8,10 (3,85)	1,39	,164
Dangerousness	11,14 (4,96)	11,48 (5,17)	11,07 (4,92)	1,13	,259
Fear	9,08 (5,01)	9,02 (5,17)	9,12 (4,96)	-,279	,780
Support	23,59 (3,37)	22,36 (3,80)	23,92 (3,17)	-5,87	,000*
Cohersion	17,05 (5,08)	17,19 (5,01)	17,04 (5,12)	,39	,698
Segregation	9,04 (4,84)	9,61 (5,27)	8,89 (4,72)	1,91	,057
Avoidance	11,92 (5,46)	12,91 (5,88)	11,68 (5,33)	2,94	,003*

¹ In the total sample, there were only six non-binary participants and two students who answered "do not know/no answer" to the question about their gender identity. Therefore, these 8 participants have not been included in the analyses based on the gender variable.

Table 3: Mean (M), Standard Deviation (SD), Student's t (t), and significance level (p) in the dimensions of the AQ-27 Questionnaire based on the following variables: direct contact with people with mental disorders, current cohabitation with a person with a mental disorder, and having or having had a mental disorder. **Source:** Own elaboration (2025)

Dimensiones	Contact with mental illness				Cohabitation with person with mental illness				Have / Had a mental illness			
	No M (DT)	Yes M (DT)	t	p	No M (DT)	Yes M (DT)	t	p	No M (DT)	Yes M (DT)	t	p
Responsibility	9,10 (3,16)	8,45 (3,34)	2,53	,012*	8,60 (3,27)	8,32 (3,52)	,99	,323	8,54 (3,25)	8,63 (3,47)	-,41	,680
Mercy	18,33 (4,01)	18,38 (3,95)	-,14	,891	18,35 (3,97)	18,47 (3,92)	-,33	,741	18,46 (3,92)	18,13 (4,04)	1,22	,221
Anger	8,83 (3,99)	8,02 (3,86)	2,67	,008*	8,31 (3,91)	7,31 (3,69)	3,00	,003*	8,29 (3,76)	7,86 (4,23)	1,65	,100
Dangerousness	12,10 (4,81)	10,93 (4,97)	3,03	,002*	11,29 (4,95)	10,23 (4,95)	2,52	,012*	11,45 (4,88)	10,33 (5,09)	3,41	,001*
Fear	10,21 (5,05)	8,83 (4,98)	3,57	,000*	9,24 (5,01)	8,04 (4,89)	2,84	,005*	9,36 (4,48)	8,33 (5,06)	3,10	,002*
Support	22,76 (3,80)	23,77 (3,25)	-3,51	,001*	23,43 (3,43)	24,55 (2,86)	-4,48	,000*	23,38 (3,44)	24,14 (3,14)	-3,52	,000*
Cohersion	17,34 (4,77)	16,98 (5,16)	,913	,361	17,12 (5,05)	16,50 (5,28)	1,44	,151	17,17 (5,02)	16,69 (5,28)	1,41	,159
Segregation	9,92 (4,84)	8,84 (4,83)	2,87	,004*	9,13 (4,86)	8,45 (4,64)	1,65	,099	9,21 (4,81)	8,56 (4,91)	2,02	,044*
Avoidance	13,17 (4,95)	11,65 (5,53)	3,86	,000*	12,21 (5,38)	10,19 (5,61)	4,39	,000*	12,31 (5,43)	10,90 (5,41)	3,90	,000*

In both variables, the lowest scores, indicating less stigma, are observed in the dimensions of anger, danger, fear, segregation, coercion, and avoidance.

Table 4: Mean (M), Standard Deviation (SD), Student's t (t), and significance level (p) in the dimensions of the AQ-27 Questionnaire based on the following variables: having received training in mental health and interest in future specialization in the field of mental health.

Source: Own elaboration (2025)

Dimensions	Mental health training				Interest in specialization in the field of mental health			
	No M (DT)	Yes M (DT)	t	p	No M (DT)	Yes M (DT)	t	p
Responsibility	8,75 (3,25)	8,50 (3,33)	1,14	,255	8,74 (3,28)	8,44 (3,29)	1,47	,142
Pity	18,56 (3,91)	18,31 (3,98)	,92	,360	18,30 (4,06)	18,40 (3,91)	-,41	,685
Anger	8,85 (3,97)	7,93 (3,85)	3,50	,000*	8,76 (4,05)	7,77 (3,74)	4,20	,000*
Dangerousness	12,36 (5,10)	10,72 (4,85)	4,93	,000*	12,30 (5,06)	10,35 (4,76)	6,25	,000*
Fear	10,11 (5,21)	8,72 (4,90)	4,11	,000*	9,99 (5,23)	8,46 (4,79)	4,96	,000*
Help	22,97 (3,64)	23,81 (3,25)	-3,50	,001*	22,63 (3,80)	24,25 (2,87)	-7,72	,000*
Coercion	17,57 (4,76)	16,85 (5,20)	2,08	,038*	17,73 (4,80)	16,53 (5,23)	3,92	,000*
Segregation	10,19 (5,08)	8,63 (4,70)	4,79	,000*	9,78 (4,83)	8,52 (4,81)	4,29	,000*
Avoidance	13,10 (5,52)	11,52 (5,38)	4,31	,000*	13,28 (5,47)	10,95 (5,28)	7,13	,000*

Of all the variables analyzed (Tables 3 and 4), the dimension with the highest score was the help dimension. The dimension that showed no differences based on the variable analyzed was compassion.

Finally, after analyzing the disorders most stigmatized by students, we found that schizophrenia is most frequently perceived as

the most dangerous disorder (37.1%), followed by depression (28.3%), eating disorders (ED) (4.7%), and borderline personality disorder (BPD) (4.6%). On the other hand, the disorders most frequently perceived as least dangerous are anxiety (35.3%), obsessive-compulsive disorder (OCD) (11.5%), attention deficit hyperactivity disorder (ADHD) (8.1%), and depression (6.2%), respectively.

4. Discussion

This study was based on one objective: to analyze and compare the stigmatizing attitudes of health science university students toward mental disorders, taking into account various variables such as gender, experience with mental illness (living with a person with mental illness, direct contact with someone with mental illness, currently having or having had a mental illness), training on this subject, and desire to specialize in the area of mental health.

Regarding the hypotheses we proposed in this research, the first hypothesis is confirmed, as women have shown more positive attitudes than men toward mental disorders. Although studies

have found the opposite (Samari et al., 2018), most results regarding gender differences indicate that men have higher EHTM (Al Omari et al., 2022; Atienza-Carbonell et al., 2023; Molina Mula et al., 2018; Sandhu et al., 2021). Corrigan and Watson (2007) suggest that women may have better attitudes because they are more likely to help people with mental health problems and less likely to avoid them than men, as well as blaming them less for their disorders and not perceiving them as “incompetent.” For their part, Amaechi et al. (2023) propose that this could be related to the fact that women generally show more social empathy than men, especially after receiving training in the field of mental health.

The second and third hypotheses of this study are confirmed: direct contact with mental disorders, whether because one knows someone who suffers from mental health problems or lives with them, or because one has or has had a mental health problem oneself, has been associated with better attitudes toward these individuals in most dimensions of the AQ-27, both cognitively (they are held less responsible for their problem and are considered less dangerous), emotionally (less anger and fear), and behaviorally (predisposition to help and less tendency toward segregation and avoidance). We find the same results in numerous studies (Atienza-Carbonell et al., 2022; 2023; Moreira et al., 2021; Oliveira et al., 2020; Rodríguez Almagro et al., 2019; Samari et al., 2018; Sandhu et al., 2019; Sari and Yuliastuti, 2018).

Amaechi et al. (2023) propose that direct contact with people suffering from mental disorders could reduce stigma towards them because it increases awareness, knowledge, and understanding of the issue, improving the way symptoms are perceived and reducing the myths that cause fear. We hypothesize that this occurs in the same way when the person suffers from mental health problems, adding a component of empathy. Since I have suffered from X disorder, I can identify with those who suffer from it, and therefore I perceive them more favorably than if I had not suffered from the disorder. Authors such as Samari et al. (2018) and Solmi et al. (2020) similarly emphasize the importance of empathy and understanding of feelings in addressing mental health problems as crucial factors in reducing EHTM.

The fourth hypothesis is not supported, as receiving professional help is not significantly related to EHTM. It seems that this aspect has been little studied, especially when compared to other variables such as direct contact or knowledge about mental illness. We have only found one previous study that found a positive relationship between receiving professional help and the tendency to help those with mental health problems (Fernandes et al., 2022). In this study, the researchers reemphasize the importance of the empathy that is generated between the student/professional and the patient; those who have

received psychological or psychiatric treatment become more aware of the difficulties suffered by people with mental health problems, leading to less fear of them and more willingness to help. Therefore, further research on this specific factor is needed to confirm more accurately its possible relationship (or lack thereof) with EHTM.

The fifth hypothesis is fulfilled, as training in mental disorders has been linked to better attitudes towards them (less stigma). Our results are consistent with those found in other studies (Al Omari et al., 2022). Thus, it seems logical to think that if this training has been received (either self-taught or during a degree program), it will reduce stigma. However, training understood as “knowledge about mental disorders” alone may not be sufficient to reduce EHTM. Atienza-Carbonell et al. (2023) found no differences between medical students and the general population. Some studies indicate that stigmatizing attitudes persist in medical students despite the training they have received (Babicki et al., 2021; Oliveira et al., 2020). Along these lines, Fernandes et al. (2022) and Atienza-Carbonell et al. (2023) suggest that increasing theoretical knowledge alone is not as closely related to a long-term improvement in attitudes toward mental disorders, but rather that clinical experiences with patients must complement it.

Other studies have addressed the passage of time in training (the progression or advancement of courses), such as Rodríguez Almagro et al. (2019), who propose a very similar idea: the reduction of stigma is related not only to increased theoretical training, but also to the opportunities that exist to come into contact with patients through residencies and internships. This is particularly important to consider, given that degrees such as Psychology, in most Spanish universities, typically only offer practical subjects during the final year of the degree. In contrast, other degrees, like Nursing, offer internships from the third year onwards. These data support the need to ensure that health science students have contact with patients as early as possible, as claimed by Masedo et al. (2021): not only because of its importance in terms of the quality of their training, but also because of its direct relationship with all the variables that promote positive attitudes towards mental disorders.

The sixth hypothesis is fulfilled, since having an interest in specializing or working in mental health has been linked to better attitudes toward mental disorders. These results have been replicated: medical students who planned to specialize in psychiatry and participate in volunteer activities showed greater acceptance of people with mental disorders than those who did not plan to specialize in this field (Ortiz Melgar, 2024; Zitoun et al., 2021); or students who had considered working in mental health showed less anger, avoidance, and dangerousness toward patients with mental disorders (Fernandes et al., 2022). Several studies have also found that medical students' rejection of specializing in psychiatry could be linked to negative attitudes toward mental health problems (Janoušková et al., 2021; Kodakandla et al., 2016). Therefore, it may be advisable to encourage students' interest in this field, regardless of whether they ultimately choose it or not, in order to reduce their EHTM. This would be particularly beneficial for students in the health sciences.

The results of a study based on a systematic review and meta-analysis (Wong et al., 2024) go a step further in supporting not only the effectiveness of education in reducing stigma about mental illness among health science students, but also among professionals working in the health field (healthcare professionals) to foster an inclusive, compassionate environment and a holistic understanding of mental illness. We are talking about including this training not only in the standard educational curriculum, but also in continuing education (for professionals). Training based on direct interaction with people with mental illness, which transforms stigmatizing beliefs and attitudes. To ensure that attitude changes and learning are sustained over time, these authors recommend implementing follow-up sessions.

The seventh hypothesis is partly fulfilled, as schizophrenia has been the disorder most often classified as the most dangerous (Da Silva et al., 2020; Samari et al., 2018). Moreover, anxiety and OCD are some of the disorders most often classified as the least dangerous. We believe that talking about “most/least dangerous disorders” is representative of attitudes towards them, as

reflected not only in the theoretical proposal by Corrigan et al. (2003), with dangerousness being one of the main dimensions of EHTM, but also in other studies (Mannarini et al., 2020), which have highlighted the relationship between “perception of danger” and “EHTM.” Amaechi et al. (2023) suggest that disorders that appear to cause more harm to others than to those who suffer from them may be perceived as more threatening, which could be the case with schizophrenia. This is undoubtedly contributed to by the highly negative portrayal of the disorder in the media, films, and television series.

In the case of depression—classified as one of the least dangerous disorders in some studies and at the same time as one of the most dangerous (second only to schizophrenia) in other studies (Da Silva et al., 2020; Samari et al., 2018)—this could be because it is one of the best-known diagnoses, so it would be normal for it to be the first answer that comes to mind when asked these questions. In the case of anxiety, which is equally well known, the fact that it has not been classified as one of the most dangerous disorders could be because it is not understood from a clinical perspective but rather from the perspective of “normality” or “everyday life.” In other words, saying “I have anxiety,” which can be seen as something normal and even expected during periods of high workload or exams, would not have the same impact as saying “I have depression,” which could take on a much more pathological character (to the point of being seen as something that does require professional help).

Some of the limitations of this study are:

- The sample is not probabilistic, as its collection depended on the collaboration of the teaching staff. Additionally, only students from a particular university participated. Therefore, the results obtained are not easily generalizable.
- EHTM is a topic that is particularly vulnerable to social desirability (Rodríguez Almagro et al., 2019); however, we did not apply any tests to assess it due to the time constraints associated with administering questionnaires during class.
- Although the non-response rate was very

low, we cannot be sure that those who did not respond are the same or would have given the same answers as those who did participate (non-participants could be significantly different from study participants).

- The responses of “most dangerous disorder” and “least dangerous disorder” could be due more to the popularity and visibility of specific diagnoses than to the accurate perception of danger in them or knowledge about them. Along these lines, we cannot deny the influence of various social factors on the EHTM, including communication, entertainment, and the culture surrounding mental health. These factors should be analyzed.

Given these limitations, we propose that future lines of research are necessary, such as

- Comparing the attitudes of health science students from different universities in Spain in order to obtain more generalizable results and enrich the different educational models with each other.

- Analyzing EHTM in health professionals to see if these university attitudes are replicated in clinical practice, as studies from other countries have found that these attitudes are maintained over time (Husain et al., 2020; Wong et al., 2024)

- Assess the quality of the relationship with the person suffering from mental disorders as a possible relevant variable, since, depending on whether the experience with them has been positive or negative, it may influence the development of greater or lesser stigma (Oliveira et al., 2020; Yuan et al., 2017).

5. Conclusions

Based on the results obtained, and considering the limitations mentioned above, we can affirm that the best attitudes are positively related to direct contact with someone suffering from a mental disorder, to having suffered from a mental disorder, to having received training on the subject, and to having an interest in specialization in mental health. Women have fewer EHTM than men; the most stigmatized disorder is schizophrenia, and the least stigmatized is anxiety.

Taking all of the above into account, we believe it is necessary to improve the education that health science university students receive regarding attitudes toward mental health. We therefore propose that contact with patients suffering from mental health problems be encouraged through extensive supervised practice as early as possible, with particular support for work with those diagnoses or groups that are most stigmatized. This will not only reduce negative attitudes through contact but will also have an impact through other collateral variables, such as increased knowledge about mental health or possible interest in this field.

Working to reduce EHTM is not only the responsibility of future professionals; it is also the responsibility of current professionals. These specific individuals must ensure dignified care for patients, but also of institutions such as universities, which must propose a training and academic model that covers all the needs outlined above: for the sake of the students, for the quality of the educational centers, and for the development of the community that will benefit from the good work of its health professionals in general and mental health professionals in particular. Furthermore, reducing stigma among university students in health-related disciplines can contribute to creating a more inclusive campus, one that is more respectful of students with mental health issues; this will help them seek help and psychological support when they need it.

We must work to create a healthier and more inclusive world, with all the duties and rights that this implies. University students are important agents of change in society. If stigmatizing attitudes are addressed and changed during

university education, these changes are more likely to be reflected in future health professionals.

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Ethical research in autism: An integrative review of autistic perspectives on overcoming pathological paradigms

Investigación ética en el autismo: Una revisión integrativa de perspectivas autistas en la superación de paradigmas patológicos

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Ethical research in autism: An integrative review of autistic perspectives on overcoming pathological paradigms

Investigación ética en el autismo: Una revisión integrativa de perspectivas autistas en la superación de paradigmas patológicos

Abstract

Autism is recognized as a variation of neurodevelopment characterized by some degree of difficulty in communication and social interaction. The emergence of the neurodiversity paradigm has motivated research that enables a more constructive practice in contrast to the prevailing pathological paradigm. The tensions between these paradigms have opened necessary discussions that must be examined prior to initiating research processes. Objective: To explore the ethical tensions described in the literature and the proposed prevention strategies. Methodology: An integrative literature review was conducted. The keywords “ethical” AND “autism” AND “research” and their combinations were used, resulting in 14 selected articles after screening. Findings highlight the importance of ethical frameworks that value autistic identity, community participation, and contextually grounded well-being approaches. Conclusion: It is crucial to adopt an inclusive approach that values the voices and perspectives of autistic individuals throughout the research process. Critical theory and the concept of neurocosmopolitanism are proposed as tools to reconfigure research and ensure inclusive, respectful practices centered on the experiences of autistic people.

Keywords: Ethics research, autism, Community Participation, Social Discrimination, neurodiversity

Resumen

Se reconoce el autismo como una variación del neurodesarrollo caracterizada por algún grado de dificultad en la comunicación e interacción social. La aparición del paradigma de la neurodiversidad ha motivado investigaciones que permiten una práctica más constructiva en oposición al paradigma patológico prevalente. Las tensiones entre paradigmas han abierto discusiones necesarias de examinar previo a iniciar procesos investigativos. Objetivo: Indagar en las tensiones éticas descritas en la literatura y las estrategias de prevención propuestas. Metodología: revisión integrativa de la literatura. Se utilizaron las palabras claves “ethical” AND “autism” AND “research” y sus combinaciones, seleccionando 14 artículos tras el cribado. Los hallazgos subrayan la importancia de marcos éticos que valoren la identidad autista, la participación comunitaria y enfoques de bienestar contextualizados. Conclusión: Es crucial adoptar un enfoque inclusivo que valore las voces y perspectivas de las personas autistas en el proceso investigativo. La teoría crítica y el concepto de neurocosmopolitismo se proponen como herramientas para reconfigurar la investigación y garantizar prácticas inclusivas, respetuosas y centradas en la experiencia de las personas autistas.

Palabras clave: ética en investigación, autismo, participación comunitaria, discriminación social, neurodiversidad

1. Introduction

To protect the rights, dignity, and well-being of participants, Research involving human subjects is subject to international ethical regulations (Nuremberg Code, 1947; World Conference on Research Integrity Foundation, 2010; World Medical Association, 2013). Some of the key principles include: obtaining informed consent from participants; minimizing risks while maximizing benefits; ensuring the confidentiality and anonymity of the information collected; allowing contributors to withdraw from the study at any time; and obtaining approval from a scientific ethics committee before beginning the Research (Emanuel, 1999; The World Medical Association, 2013). In addition, special attention should be paid to vulnerable populations to ensure that their participation is voluntary by adequately addressing their specific needs (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Compliance with these ethical principles is essential to maintaining the integrity of Research and protecting the human rights of participants.

Autism research formally began in the 1940s with the work of Kanner (1943) and Asperger (1944). These studies marked the beginning of the recognition of autism as a condition distinct from other developmental disabilities. Both authors defined autism as a deviation from the norm from a medical and pathological paradigm. Although their observations differed, they considered autism to be a disorder to be understood in terms of deficits and limitations related to social development and adaptive abilities.

Starting in the 1960s and 1970s, Research based on genetics, neurobiology, and cognitive psychology began to refute these theories, giving rise to more scientific and accurate models. Since then, autism has been recognized as a neurodevelopmental disorder with biological causes, which has led to a more comprehensive approach to its study and treatment (APA, 2013)

Autism is now recognized as a neurodevelopmental variation characterized by some degree of difficulty in communication and social interaction. As such, autistic individuals require support that addresses their specific needs throughout their lives (Braden et al., 2022; Deserno et al., 2019; Knüppel et al., 2018; Liu et al., 2023; Williams & Gotham, 2022).

It is important to consider that disability as a construct has historically been influenced by prevailing sociopolitical forces. Thus, prior to the emergence of medicine, people with disabilities (PWD) were perceived as bearers of divine judgment that fell upon the family or community due to a moral or religious transgression (Anderson-Chavarria, 2022). Starting in the 1930s, the medical model gained traction and expanded, promoting biologism, pragmatism, individualism, and normalization, among other concepts (Menéndez, 2020). Thus, the medical model is used for the diagnosis, intervention, and Research of PWD, understanding from this perspective that disabilities are pathological in nature and must be corrected. In this context, the pathological paradigm establishes the dichotomy between “normal” and “abnormal,” tacitly favoring the “normal” state as the desirable ideal. From this representation, disability acquires an individual character, situating itself within the body or mind of individuals (Marks, 1997) and disconnecting it from the other systems that comprise society.

In this framework, the role of biologism as a structural feature of medicine is particularly notable. Through it, scientific foundations are given to diagnoses and treatments, forming the core of training for future professionals. However, although the medical model has permeated the discourse of the general population, it has been understood that disability cannot be understood outside the social structure (Marks, 1997). Thanks to this perspective, the relationships between people, their social, political, and cultural conditions, and other factors have been

incorporated into the analysis of disability, building, over time, an ecological approach to disability.

Thus, initial Research tended to exclude or subordinate autistic people in decision-making (Menéndez, 2003), subjecting them to biological criteria. Thus, cognitive or physical differences between people were considered deficits to be normalized in order to achieve typical development (Dwyer, 2022). According to Shakespeare (2013), this reductionist model does not consider the complexity of the elements that shape disability and has ultimately led to scenarios of discrimination and oppression by establishing itself as a means of classifying people based on their functionality.

The neurodiversity movement emerged in the late 1990s as a response of self-defense and vindication of rights by autistic people and their communities. Its emergence occurred in parallel with criticism of medicalized and pathologizing approaches to autism, promoting a vision that recognizes cognitive diversity as a social and political value, and not merely as a condition to be corrected. This movement has had a significant impact on Research and policy-making by questioning the centrality of normalization and emphasizing the participation of autistic people in studies that concern them (Hughes, 2016; Chapman, 2021). In the same vein, the neurodiversity paradigm (Silverman, 2015) has led to a series of research studies, whose contributions have served as the basis for constructive practice in opposition to the prevailing pathological paradigm. This paradigm promotes a shift in perspective on autism, fostering respect for neurological diversity, as differences in brain functioning are viewed as a natural expression of human diversity (Singer, 1998). Of particular note is the incorporation of the concept of biodiversity, understanding that each organism contributes to the system in its capacity to remain and thrive, persisting in the face of changes over time. From this perspective, organisms are neither functional nor dysfunctional in themselves, but rather in the contextual relationship between the organism, its environment, and ecology (Chapman, 2021).

From this paradigm, neurocognitive diversity is rethought as not only a typical but also a healthy manifestation of biodiversity. Furthermore, it is recognized that disability arises from the interaction between the individual and social levels. From this perspective, interventions should focus on the particular environment in which the person operates, minimizing their difficulties in the face of the challenges and changes they encounter. It is essential to note that neurodiversity does not deny disability, but rather problematizes it in social and political terms, highlighting both the strengths and the deficits of each person within their historical and cultural context (Jurgens, 2023).

In this way, tensions between paradigms have opened up dialogues that must be examined prior to initiating research processes in order to avoid continuing to generate evidence that increases the exclusion, stigma, and discrimination to which the autistic population has been subjected, given its minority status. In this vein, it is essential to acknowledge how ableism has influenced the way functional deficits are perceived, often being interpreted as a condition that devalues human beings, rendering them as essentially negative entities that must therefore be eliminated or cured (Toboso, 2021).

For its part, the World Health Organization (WHO) at the 67th World Health Assembly (WHO, 2014) noted that autistic people face barriers that limit their equal participation in society, facing social stigmatization, isolation, and discrimination, which is incompatible with human dignity. It therefore urges its member states to recognize the specific needs of affected individuals, develop or update relevant policies, laws, and multisectoral plans, support Research and campaigns against stigmatization, increase the capacity of health and social care systems, ensure timely detection and treatment in primary health care (PHC) services, and strengthen information systems, scientific data, and Research, among other points.

It is important to view Research as a tool that can contribute to the generation of solutions to complex problems, while always respecting the ethical principles and values that protect

participants and the communities to which they belong (Calia et al., 2021). Thus, Research should be seen as a potential agent of social change, raising awareness of relevant and emerging issues, such as the autistic population in this case.

Based on the above, the following research question is posed: What are the ethical tensions

identified in the literature on autism research, and what prevention strategies have been proposed by different authors to address them? Thus, the objective of this review is to analyze these ethical tensions and examine the suggested prevention strategies in order to offer an integrated vision that guides more responsible and inclusive research practices.

2. Materials and methods

An integrative literature review (Manterola, 2023) was conducted in the PubMed database following the PRISMA 2020 recommendations (Page et al., 2021) adapted to the characteristics of an integrative review. This included the identification, screening, eligibility, and inclusion of studies, documented using a PRISMA flow diagram. The PubMed database was selected due to its wide accessibility to Research, with a specialized focus on health sciences, its provision of advanced tools for precise searches, and its ability to provide relevant, high-quality literature. In turn, its organized structure and access to peer-reviewed studies minimized the risks of bias, facilitating a review based on solid, up-to-date evidence.

The search restrictions were: original works, full online access, and publication date within the last five years. The time frame was established to capture recent advances in a rapidly evolving field, thus ensuring a certain degree of homogeneity in research methods and social and technological contexts.

The inclusion criteria were that the studies addressed autism in adults and issues related to ethical conflicts or suggestions in Research. Articles focusing on children, caregivers, or parents, as well as Research on pharmacological treatments and those that included comorbidities, were excluded. To ensure the quality of the selected texts, their methodological rigor and relevance to the review's objective were evaluated, considering the clarity of the issue, the theoretical basis, and their contribution to understanding ethical dilemmas.

The search was conducted between October 7 and 13, 2024. Keywords obtained from Medical Subject Headings (MESH) and their combinations were used: “ethical” AND “autism” AND “research,” programmed to appear anywhere in the document. The selection process was carried out in three phases: (1) elimination of duplicates using the PubMed tool; (2) screening by title and abstract; and (3) full-text review to confirm relevance. The initial search yielded 137 records, of which eight were selected after applying the inclusion and exclusion criteria. Subsequently, six additional articles were identified through reference review (“snowballing”), totaling 14

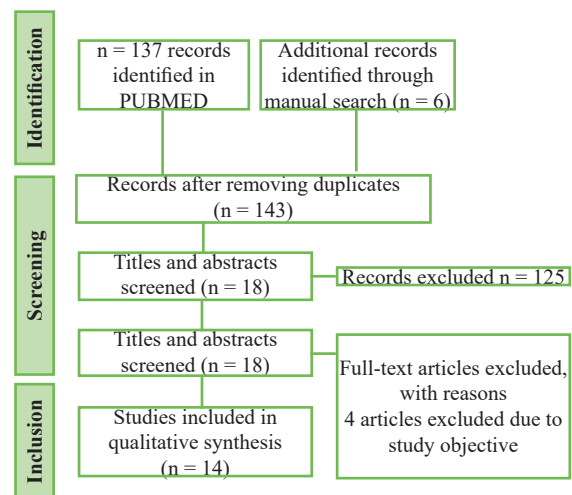


Figure 1: Prisma diagram of article selection.
Source: Author (2024)

articles included (Figure 1).

For systematization, a matrix was constructed in Microsoft Excel to collect the following

information: title, country, authors, year, study objective, methodological design, primary findings, and reported ethical tensions. This information served as input for subsequent thematic analysis.

A qualitative thematic analysis approach was used to analyze the documents (Braun & Clarke, 2006). A manual open coding process was applied, in which each article was read in its entirety and fragmented into units of meaning

related to ethical tensions and prevention strategies. The identified units were recorded in an Excel matrix along with the corresponding bibliographic references.

Subsequently, related codes were grouped into subcategories and categories, following an iterative process of constant comparison. The coding was performed independently by the author and reviewed twice to ensure internal consistency and completeness.

3. Results

The selected articles are presented in Table 1, considering the title, country, authors, and objective.

Four predominant categories or tensions emerged from the open coding, namely: conceptualization of autism, prevent or accompany?, participation, and autistic well-being. The relevant categories and tensions identified through the analysis of the articles are presented below.

3.1. Conceptualization of autism

Seven of the articles reviewed acknowledge ethical questions that have arisen around how autism is conceptualized. Hens' (2019) research explores the duality between the biological component of autism and lived experience. The latter translates into the specific way in which autistic people process information and sensory sensitivity. Hens (2019) proposes that autism is a polysemic concept, which considers both its biological nature and the lived and bodily experiences associated with it. For Hens (2019), understanding autism as a polysemic concept allows researchers to recognize that genetic or neurological causes do not fully explain why certain people exhibit behaviors considered autistic. It is also necessary to understand the meaning these behaviors hold for each individual within a specific context. However, this approach raises new ethical questions related to treatment and diagnosis, promoting a non-reductionist interpretation of autism.

Walker et al. (2021) note that the reductionist pathological paradigm is based on the premise that significant deviations from sociocultural norms (predominant in cognition and corporeality) are perceived as manifestations of deficiencies or disorders. For the authors, the pathologization of neurominorities can be considered as yet another expression of systemic oppression, functioning in a similar way to the domination faced by other minorities (Walker et al., 2021).

In this context, Manzini et al. (2021) add that the particular experience of autism is a fundamental element of a person's identity and, at the same time, represents yet another expression of human diversity. However, Manzini et al. (2021) defend the pragmatic and social function of psychiatric diagnosis, pointing out that the label facilitates access to the support and services needed by autistic people. They also warn that eliminating the diagnosis could have repercussions on the identity and sense of self of those who already have it.

For his part, Mole (2017) questions whether autism should be classified as a disorder or claimed as a positive identity. In this regard, Bervoets et al. (2020) raise the need to depathologize autism. The authors emphasize that the difficulties experienced by autistic individuals occur in their interactions with their environment and are exacerbated by the lack of necessary support or adjustments in various contexts. Along the same lines, Kourti (2021) highlights the rejection of medicalized and pathologizing approaches to

Table 1: Selected articles
Source: Author (2024)

	Title	Country	Authors	Objective
1	The many meanings of autism: conceptual and ethical reflections.	Belgium	Hens (2019)	To describe the conceptual challenges faced by ethicists when attempting to make sense of ethical issues surrounding autism.
2	Ethical dimensions of translational developmental neuroscience research in autism	United Kingdom	Manzini et al. (2021)	Provide an overview of the ethical issues arising from the growing understanding of the neurological development of children in the early years of life.
3	Autistic Self-Advocacy and the Neurodiversity Movement: Implications for Autism Early Intervention Research and Practice.	England	Leadbitter et al. (2021)	Argue that all stakeholders in autism intervention should understand and actively participate in ethical debates.
4	How are adults with capacity-affecting conditions and associated communication difficulties included in ethically sound research? A documentary-based survey of ethical review and recruitment processes under the research provisions of the Mental Capacity Act (2005) for England and Wales	United Kingdom	Bunning et al. (2022)	Determine the characteristics of ethical review and recruitment processes in relation to the inclusion of adults with conditions that affect capacity and associated communication difficulties in ethically sound research, in accordance with the provisions of the Mental Capacity Act (MCA, 2005) for England and Wales.
5	Including Speaking and Nonspeaking Autistic Voice in Research	Canada	Lebenhagen (2020)	To improve the recognition and inclusion of the autistic voice in research, assumptions and practices that equate the spoken voice with the rational voice must be changed.
6	Being, Knowing, and Doing: Importing Theoretical Toolboxes for Autism Studies	United Kingdom	Rosqvist (2023)	To think about and develop theories developed outside of autism research and the autistic community, and through this support the production of new autism-led theories.
7	Going Beyond the Catch-22 of Autism Diagnosis and Research. The Moral Implications of (Not) Asking “What Is Autism?”	Belgium	Bervoets (2020)	Reconceptualize autism to make space for imagining autistic people as moral agents who are not wholly determined by their autism
8	A Critical Review of Academic Literature Constructing Well-Being in Autistic Adults	China - US	Lam (2021)	Identify and critique how well-being is constructed in autistic adults in research
9	Person-oriented ethics for autism research: Creating best practices through engagement with autism and autistic communities	US - Canada	Cascio (2020)	Present advice on everyday ethics when autistic people participate in research
10	Academic, Activist, or Advocate? Angry, Entangled, and Emerging: A Critical Reflection on Autism Knowledge Production	United Kingdom	Botha (2021)	Present a critical reflection on academic experiences as an autism researcher
11	A Critical Realist Approach on Autism: Ontological and Epistemological Implications for Knowledge Production in Autism Research	United Kingdom	Kourti (2021)	Exploring how the principles of critical realism can help strengthen autistic-led theories of autism
12	Making Autism Research Inclusive by Attending to Intersectionality: a Review of the Research Ethics Literature	Canada	Cascio (2021)	Review research ethics concerns surrounding sex and gender; level of support needs; modes of communication; race, ethnicity, geography, and language; socioeconomic status; and age.
13	Toward a Neuroqueer Future: An Interview with Nick Walker	USA	Walker (2021)	State of neurodiversity studies and practice, past, present, and future
14	Improving research about us, with us: a draft framework for inclusive autism research	Spain, United Kingdom, Australia	Chown (2017)	Analyze the concepts of participatory research and emancipatory research before presenting a draft framework for truly inclusive autism research.

autism by neurodiversity movements, raising the need to understand how social constructs and underlying power relations influence the interpretation of autism. Failure to bring about these changes in the way autism is understood would mean continuing with discriminatory practices that impact the mental health and well-being of this group of people.

For Bervoets et al. (2020), it is essential to conceptualize autism as an ambivalent sociobiological phenomenon, emphasizing in this reconceptualization that autistic people are agents not entirely determined by their condition. While diagnosis facilitates identification processes, it also generates inconsistencies, because accepting this label carries the weight of stigma and associated stereotypes (Bervoets and Hens, 2020).

The Research by Chown et al. (2017) gathers the ideas of a group of autistic adults and proposes a series of recommendations for autism research. Among these, it highlights that Research should prioritize an emancipatory approach using language that prioritizes identity and the person. In addition, they invite us to consider autism as a developmental disability, rather than an intellectual disability or a mental health problem, although these may coexist.

Similarly, Botha (2021) offers a scathing critique of the literature on autism, arguing that some studies have led to the dehumanization of this group. In this context, he argues that the way in which Research has been presented has led to the denial of the full humanity of autistic people, their group identity, and their ability to experience complex emotions. Likewise, important traits such as civility, moral sensitivity, logic, maturity, individuality, and agency, among others, have been denied. These types of dehumanizing narratives represent an act of violence against autistic people and contribute to interpersonal victimization (Botha, 2021).

3.2. Prevent or accompany?

A relevant topic raised by four of the articles reviewed is the need to consider the model underlying the conceptualization of autism when conducting Research.

Botha (2021) mentions that the positivist biomedical model tends to interpret deviations from the norm as disorders. In this context, rehabilitation, prevention, and cure are considered the main objectives of Research. However, Botha (2021) argues that autism cannot be explained solely from a biological perspective, both because the genes involved occur in a wide range of constantly evolving combinations and because autistic brains are neurobiologically heterogeneous.

Nevertheless, it must be acknowledged that most autism research has been based on the biomedical paradigm, whose main objective has been to discover the underlying mechanisms that lead to pathological behaviors or even to find a cause or cure for the condition (Bervoets & Hens, 2020).

For Manzini et al. (2021), a relevant point to discuss is whether autism research should continue to search for genetic or neurological markers that would enable preventive interventions. In this context, they question whether Research aimed at “prevention” is focused on people’s well-being or on finding “cures” for behavioral expressions. This approach has led autistic adults to discuss whether early interventions in autistic children are aimed at normalization, with the expectation that through these interventions, they will become indistinguishable from their neurotypical peers. Along the same lines, Manzini et al. (2021) highlight two conflicting ethical principles regarding early detection research: on the one hand, the right of parents to know their children’s susceptibility and to intervene when such a suspicion arises; and, on the other hand, “improvement” interventions chosen by parents, which could be aligned with normalization and ableism.

For their part, Leadbitter et al. (2021) point out that interventions should respect those aspects that bring happiness and joy, warning that neurotypical parents may overlook certain elements from the perspective of their autistic children. In this regard, Leadbitter et al. (2021) suggest that future researchers reflect on how their intervention practices align with the neurodiversity framework and the views of autistic people; include natural autistic development

processes, coping strategies, autonomy, and well-being in intervention programs; and contribute to the development and validation of tools to measure outcomes that are priorities for autistic people. Furthermore, they note that while neurodiversity acknowledges individual strengths, these strengths coexist with inherent weaknesses that may manifest in interactions with the environment. These disadvantages can be addressed through interventions targeted at those who need them, without implying that they cease to be themselves. In other words, without seeking a “cure” for who they are (Leadbitter et al., 2021).

3.3. Participation

Nine of the articles analyzed discuss the inclusion of autistic people in Research. In this regard, Rosqvist et al. (2023) note that, although community participation has become increasingly normalized in recent years, it is still considered a form of “symbolic inclusion.” The authors argue that Research must move toward integrating the unique perspectives of autistic people, who have historically been marginalized. They also emphasize the importance of the bodily experience of being autistic. This richness enables understanding of autistic behavior and contributes to knowledge in a way that cannot be matched by a non-autistic researcher (Rosqvist et al., 2023).

On the other hand, Kourti (2021) emphasizes the need for researchers to reflect on the biases inherent in their dominant social positions, which tend to view minority groups as “others” from a deficit perspective, limiting their understanding of phenomena. In this context, she emphasizes that community participation should not be dismissed or considered an administrative burden.

Another aspect that hinders participation is the exclusion of autistic people who have difficulties in verbal communication. In this sense, speech represents a form of exclusionary normativity in research processes. On this point, Lebenhagen (2020) proposes incorporating active listening, paying attention to all forms of communication of the person through the different senses. This would contribute to the inclusion and appreciation

of non-verbal forms of communication, validating the perspectives of all autistic people. The author thus challenges us to develop new forms of Research, using flexible methods that incorporate the strengths of autistic people.

For their part, Bunning et al. (2022) broaden the discussion by raising the issue of the exclusion of autistic people who have coexisting conditions that affect their “capacity.” Along the same lines, the authors highlight the need to adopt approaches that allow these individuals to be included in ethically sound Research that contributes to the development of more effective treatments. They point out that, although attempts are made to generate accessible materials for people with cognitive deficits, it is still necessary to pay attention to the linguistic content so that it is tailored to the processing needs of participants.

Cascio et al. (2020) offer ethical suggestions to researchers for incorporating autistic individuals into Research. Among these considerations are: individualizing communication about the study, especially about informed consent procedures, including a process that is accessible to all individuals with autism; adapting language to each person’s preferences; recognizing the stigma, stereotypes, and past experiences of participants that impact the research process; taking into account that autistic people have been harmed in clinical Research, which can lead to mistrust of Research; writing up results while avoiding stigmatizing words; and considering ways in which Research can empower people.

In this regard, Cascio et al. (2021) emphasize intersectionality, understood as the interaction of multiple dimensions of identity and social experience that can lead to exclusion in Research. They raise as an ethical concern the exclusion of subgroups of autistic people who are marginalized from Research and those subgroups that, due to factors such as gender, age, ethnicity, socioeconomic status, coexisting abilities, or linguistic differences, face additional barriers to fully participating in studies. To remedy this debt, it proposes the implementation of inclusive research environments and the creation of supports or facilitators such as accessible communication strategies, adaptation of materials

and procedures, or the relocation of researchers to meet with participants in environments more familiar to them, so that the full diversity of their identities and experiences is recognized and valued.

3.4. Autistic well-being

The critical review of the literature conducted by Lam et al. (2021) brings to the discussion a call from the autistic community for Research that promotes their well-being, which makes it relevant to investigate how well-being is constructed in this population. In line with this, Hens (2019) points out that well-being for an autistic person may differ from that of the more typically developing population.

The authors note that there is an implicit assumption that the domains covered by instruments assessing well-being are valued equally by everyone. Thus, it is possible to suggest that a normative understanding of well-being is proposed that could be at odds with the experiences of autistic people (Lam et al., 2021). In this context, Lam et al. (2021) promote a measure of well-being through critical theory, emphasizing a situated narrative that prioritizes and centers the perspectives of autistic people over the normative measures applied to the general community. In this way, studies that employ progressive methodologies would enable the expansion of knowledge by incorporating perspectives on diverse ways of being autistic, and would open new avenues for understanding how to promote the well-being of the autistic community.

3. Discussion

Autism is an increasingly prevalent condition (Zeidan et al., 2022) that poses several ethical challenges in Research. It is necessary to address these challenges in order to ensure that studies are conducted responsibly and respectfully, avoiding further stigmatization of this vulnerable minority group. The purpose of this review was to investigate the ethical dilemmas raised in the literature and to research prevention strategies that could improve research practice in the field of autism. Among the most prevalent ethical tensions are the way autism is conceptualized, giving way to the recognition of autistic identity; the need for the autistic community to participate in research projects as a legitimate and embodied voice; the rethinking of research objectives; and the conceptualization of well-being from a normative perspective.

First, it is essential to consider how autism is conceptualized at the time of research design, as this decision will shape the understanding of the subject and the interpretation of the results. Thus, researchers must visualize how they align with the neurodiversity framework, especially in

terms of the objectives and methodology to be used (Leadbitter et al., 2021).

In this context, the neurodiversity movement has emerged as a means of self-defense, social justice, and civil rights for autistic people (Hughes, 2016), generating ethical debates that have had a significant impact on Research, particularly studies focusing on the adult autistic population (Cascio et al., 2021; Leadbitter et al., 2021). However, Chapman (2021) points out that there is still resistance to the neurodiversity paradigm, especially among specific clinical and academic sectors traditionally linked to the biomedical approach to autism. This resistance is related to the perception that the neurodiversity approach offers a “sanitized view” of autism, that is, a representation that minimizes the challenges and difficulties associated with the condition and that, by emphasizing only the acceptance of cognitive diversity, could divert resources and attention away from those who require more intensive clinical or educational support. Chapman (2021) warns that this tension reflects a conflict between valuing the identity and autonomy of autistic

people and models focused on normalization, thus highlighting the ethical and political debates that permeate Research and practice in this field. For the author, the concept of neurodiversity highlights the collective strength inherent in cognitive diversity, which encompasses all types of differences associated with autism, such as intellectual disability or language impairments; therefore, this resistance is unfounded.

The neurodiversity paradigm views autism as a condition that shapes the way a person perceives, experiences, and interacts with the world. Therefore, from this perspective, autism becomes part of a person's identity. In contrast, the failure to recognize autistic identity by researchers who advocate for neutrality can lead to epistemic injustice (Fricker, 2007), an arbitrariness that the autistic population has experienced both in social settings and in the field of Research.

Autistic identity emerges as a relevant topic, where the lived experience of people with this condition takes precedence over the biological factors that explain it (Hens, 2019; Rosqvist et al., 2023). This individual experience demands recognition, given that the strengths and weaknesses that comprise it are part of the spectrum of human diversity (Manzini et al., 2021). On this point, the contribution of Bervoets et al. (2020) is relevant, as it reconceptualizes autism as a sociobiological phenomenon that necessitates an interdisciplinary approach for understanding.

Along these lines, Walker et al. (2021) coined the term “neurocosmopolitanism,” which implies the acceptance and appreciation of neurocognitive differences without determining one form of functioning as correct. In this way, the political value of all “neurotypes” is recognized. Thus, Walker et al. (2021) point out that autism is a culturally constructed category that will therefore cease to be relevant at some point in history.

It is important to consider that adult autistic people report perceiving the stigmatizing discourse that arises from Research negatively, recognizing the label “disabled” as offensive and a barrier to their inclusion (Rosqvist et al., 2023). Thus, the questions that arise regarding the purpose of autism research are highly relevant.

It is necessary to assess whether projects focused on the search for biological origins (focused on cure or prevention) should be maintained or whether funds should be redirected to studies that investigate how to improve the quality of life and well-being of autistic people (Lam et al., 2021; Leadbitter et al., 2021).

About community participation, the literature promotes consideration of the needs and preferences of autistic people in research objectives, recognition of the unique experiences of participants, the development of accessible consent processes that consider the communication needs that may arise, the adoption of participatory research methods, and the creation of environments that reduce barriers to access to Research (Cascio et al., 2020, 2021; Leadbitter et al., 2021). Likewise, the incorporation of autistic people as researchers is promoted, considering that the understanding of a non-autistic researcher will always be external and will not reach the level of experience of an autistic person (Rosqvist, 2023).

This approach suggests that future Research should explore how the adoption of inclusive conceptual frameworks can influence the perception of identity, agency, and well-being of autistic people, as well as the design of more equitable interventions and policies. For example, studies could be developed to compare the effectiveness of participatory methodologies versus traditional approaches, or to validate instruments for measuring well-being based on the autistic experience. It is also relevant to investigate how different conceptualizations of autism (biological, experiential, or sociobiological) impact the interpretation of results and the formulation of policies and supports. These future lines of Research would not only expand academic knowledge but also contribute to guiding inclusive research practices and policies, promoting comprehensive well-being that respects and values the diversity of the autistic community.

On the other hand, it is essential to consider reflective processes when writing research reports. This should promote respect for the preferences of the autistic community. In this

regard, the authors suggest using language that prioritizes identity, as well as the neutral use of “autism” over “autism spectrum disorder” (Hens, 2019; Leadbitter et al., 2021).

Finally, the autistic population highlights the need to focus Research on the development of autonomy and well-being (Leadbitter et al., 2021). For context, empirical studies of well-being have developed theories and instruments that allow for its measurement (Diener et al., 1985; Ryff, 2013; Ryff & Keyes, 1995; Seligman, 2011). However, the current debate is whether these studies accurately reflect the perception of autistic people or whether this construct is more closely aligned with the population that exhibits more typical development (Hens, 2019; Lam et al., 2021). In this context, there is an opportunity

to conduct studies that validate these constructs within the autistic community, enabling the development of more relevant and tailored therapeutic support.

The review presented had several important limitations. On the one hand, it focused on studies published in English, which may have restricted the inclusion of relevant Research in other languages, biasing the results toward more Western or Anglo-Saxon perspectives. On the other hand, the five-year time frame may have excluded older relevant studies. In addition, the use of a search engine may have limited the articles collected, making it interesting to expand the search in order to enrich the analysis presented.

4. Conclusions

General ethical standards for Research provide a regulatory framework that promotes the rights and well-being of individuals and communities participating in studies. These regulations permit various adaptations, depending on the population being studied, particularly for vulnerable groups. In the case of autism, it is important to be aware of these distinctions and to integrate them into the planning, conduct, and completion of Research. Ethical reflection throughout the research process must incorporate relevant elements, such as recognizing and valuing the process of identifying each autistic person. The neurodiversity paradigm promotes the acceptance and appreciation of neurological differences, thereby strengthening autistic identity as a vital part of human diversity. Thus, this paradigm serves as a framework for understanding, accepting, and valuing autistic individuals within society.

Research on well-being in the autistic community is crucial for understanding and promoting a quality of life that reflects the unique experiences

and needs of this population. It is crucial to adopt an approach that values the voices and perspectives of autistic people in the research process in a respectful and non-stigmatizing manner. In this sense, critical theory and the concept of neurocosmopolitanism offer valuable frameworks for reconfiguring how well-being is understood and measured. By prioritizing situated narratives and lived experiences, a space is opened to develop instruments and methodologies that authentically reflect what well-being means for autistic people. This will not only contribute to the creation of more effective and relevant policies but will also foster a social environment that prioritizes coexistence and respect.

Ultimately, promoting well-being in the autistic community involves recognizing its diversity and uniqueness, as well as challenging historically prevalent conceptions. In doing so, we can move toward a more equitable society where all ways of being are valued and celebrated.

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Parental psychological control and gender: perceptions among adolescents in Cuenca

Parental Psychological Control and Gender: Adolescents' Perceptions in Cuenca

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Parental psychological control and gender: perceptions among adolescents in Cuenca

Control psicológico parental y género: percepciones entre adolescentes de Cuenca

Abstract

Parental psychological control negatively affects the social and emotional development of adolescents, limiting their autonomy and adaptation. This study analyzed parental psychological control based on the role of parents and the gender of 513 high school adolescents from public and private high schools in Cuenca, Ecuador. The study used a quantitative, non-experimental, cross-sectional, and descriptive approach, applying the Psychological Control Scale Oriented to Dependency and Achievement. The results reveal greater parental control towards sons and significant differences in achievement-oriented control, with fathers tending to exert greater pressure than mothers. The conclusions highlight the importance of researching gender-sensitive upbringing to promote more equitable parenting practices.

Keywords: gender socialization, parenting practices, parent-adolescent relationship, upbringing, parental control.

Resumen

El control psicológico parental afecta negativamente el desarrollo social y emocional de los adolescentes, limitando su autonomía y adaptación. Este estudio analizó el control psicológico parental en función del rol de los padres y el género de 513 adolescentes de bachillerato de instituciones públicas y privadas de Cuenca, Ecuador, mediante un enfoque cuantitativo, no experimental, transversal y descriptivo, para lo que se aplicó la Escala de Control Psicológico Orientado a la Dependencia y al Logro. Los resultados revelaron un mayor control parental hacia los hijos varones y diferencias significativas en el control orientado al logro, con tendencia de los padres a ejercer mayor presión que las madres. Estas conclusiones subrayan la importancia de investigar la crianza con enfoque de género con el fin de fomentar prácticas parentales más equitativas.

Palabras clave: socialización de género, prácticas parentales, relación padre-adolescente, crianza, control parental.

1. Introduction

Gender shapes our identity and determines how we perceive and interact with our environment, exerting a considerable influence on the organization of our private and social lives (Endendijk et al., 2018; Liu, 2023). According to Scott (1986), gender is a cultural construct created from social concepts that define the behaviors socially assigned to men and women, implying that these roles are the product of social norms rather than biological differences. In this sense, Wood and Eagly (2012), through their Theory of the Biosocial Construction of Sex, propose that the divisions in daily and work activities between men and women are influenced by biological as well as social, economic, and cultural factors; however, the most influential factor in the differentiation processes is the biological one, which carries greater weight in traditionalist societies.

According to Molina (2000), this responds to a natural attitude, in which sex is the component on which the concept of the feminine and the masculine has been constructed. Cultural representations of gender are learned through socialization processes within a sociocultural context, with the family being the socializer par excellence (Latorre et al., 2019; Merino, 2024). Parents, through differentiated socialization practices based on the sex of their children, encourage the internalization of gender roles in boys and girls in ways that promote differences in social behavior (Wood and Eagly, 2012). Through family socialization processes, each child learns the behavioral repertoire they should assume based on their sex and role, as well as aspects such as power relations (Herrero, 2020). Therefore, parenting is the main means of transmitting values, beliefs, and attitudes that impact the adaptive behaviors of children (Díaz et al., 2021).

In this context, parenting practices are conceptualized as the mechanisms that parents use to achieve socialization goals (Velázquez and Hernández, 2024). Smetana (2017) adds

that parenting practices involve the set of skills, abilities, and attitudes that parents have to educate their children based on their stage of development and specific family circumstances; this ultimately includes gender. Several studies highlight the existence of gender-differentiated parenting (both in parents and their offspring); in turn, sons and daughters may be affected differently by these parenting practices (Alemany-Arrebola et al., 2019; Velázquez and Hernández, 2024). Hosley and Montemayor (1997) describe how differences in parenting practices between fathers and mothers occur in their Theory of Roles. They suggest that the role of mothers has traditionally been defined as that of caregiver; therefore, their parenting styles are more associated with the provision of affection and care. In contrast, the role of fathers has been defined as that of provider and disciplinarian, excluding the provision of warmth and care to their children. In relation to this, Gvozdenović and Bandalović (2024) mention that fathers tend to affirm that mothers are more involved in parenting and that their participation seems more significant, mainly because they spend more time with their children, which allows them to form closer bonds and connections. Despite this, this perception can be modified depending on social and cultural changes.

The study of parenting practices is approached from the perspective of Self-Determination Theory, which fundamentally proposes the study of motivation through the exploration of individuals' basic needs and the processes that give meaning to the internal and external stimuli that satisfy these needs (Stover et al., 2017). From this perspective, Ryan and Deci (2017) argue that basic psychological needs, such as the need for competence, relatedness, and autonomy, are the basis for well-being and healthy psychological development throughout an individual's life cycle. Parents play an important role in satisfying these needs, as well as in the development of autonomous or controlled regulation of their children's behavior (Soenens et al., 2010)

Based on *Self-Determination Theory*, a tripartite dimensional model of parenting was conceptualized, based on the dimensions of autonomy support, provision of structure, and parental involvement (Grolnick et al., 1997), grounded in the idea that these dimensions are related to the basic psychological needs that facilitate the internalization of social norms and values by children (Di Pasquale and Rivolta, 2018; Rodríguez-Menéndez et al., 2018). Parental involvement encompasses the warmth and affection of parents, expressed through displays of attention and positive dedication to the optimal development of their children (Grolnick and Slowiaczek, 1994). Positively involved parents provide emotional and concrete resources that foster children's sense of confidence and self-direction (Di Pasquale and Rivolta, 2018). However, there are also inappropriate forms of parental involvement, such as rejection, lack of involvement, and hostility, which impact children's development. These practices are associated with higher levels of internalizing problems (anxiety and depression) and externalizing problems (aggression and disruptive behaviors) (Rothenberg et al., 2022).

Providing structure can be defined as the degree of organization of the environment in facilitating children's skills. Parents are responsible for explaining the behaviors expected by the environment by providing a sense of why (rules and norms) and their connection to certain consequences, which allows for the anticipation and planning of behavior (Di Pasquale and Rivolta, 2018; Rodríguez-Menéndez et al., 2018). The opposite of this dimension is chaos, understood as the lack of predictability about the consequences of actions and the chaotic nature of the parental environment (Grolnick et al., 2015). Finally, support for autonomy is understood as the recognition of points of view, the possibility of making decisions, and the motivation to solve problems autonomously during the processes of transmission of social norms and demands by parental figures (Di Pasquale and Rivolta, 2018). The opposite of autonomy is psychological control, which refers to coercive behaviors that prevent autonomous development (Rodríguez-Menéndez et al., 2018).

In this sense, psychological control as a dimension of parenting is conceptualized as a negative form of control, mainly because it inhibits psychological development through the manipulation and exploitation of the parent-child bond, expressions and criticism laden with affection, and excessive personal control (Barber et al., 1994; Rodríguez-Menéndez et al., 2018). Solís and Manzanares (2019) add that it is related to problems of emotional and social adjustment in children due to its impact on aspects such as the development of autonomy, withdrawal, disruptive behaviors, disobedience, aggressiveness, impulsivity, and the risk of low self-esteem, as well as problems of depression. Additionally, Barber and Harmon (2002) and Grolnick and Pomerantz (2009) mention that psychological control as a parenting practice undermines the healthy development of parental functions, as parents are unable to differentiate their own needs from those of their children, which in turn impacts the satisfaction of the latter's needs. From this perspective, Barber (1996) mentions that psychological control occurs in the following ways: a) Induction of guilt, which involves using guilt to make children comply with parental expectations; b) Withdrawal of affection, where love and attention are used as rewards or punishments to make children adapt to their parents' demands; c) Inducing anxiety, whose purpose is to make offspring act in accordance with the wishes of their parents; and d) Invalidating the perspective of the child or adolescent, where their thoughts, desires, and emotions are disqualified (Rodríguez-Menéndez et al., 2018).

On the other hand, Soenens et al. (2010) mention that parental psychological control can be perceived in two ways: dependency-oriented and achievement-oriented. The former is defined as the use of control to keep children within narrow physical and emotional boundaries; and the latter as the pursuit of excessive standards of achievement by parents. Parents with this perspective impose pressure on themselves to perform well and perceive low performance as a threat, leading them to behave in a controlling manner and constantly demand successful results (Grolnick, 2002; Soenens et al., 2010).

These dynamics differ between sons and daughters. In some studies, sons reported perceiving greater psychological control than daughters (Luebbe et al., 2014; Shek, 2008), while other studies found no significant differences (Cui et al., 2014; Mabbe et al., 2016). Furthermore, it has been observed that the effects of parental control may vary depending on whether it is exercised over a daughter or a son; It may be linked to the adjustment of offspring, improving (behavioral control) or worsening (psychological control) the quality of the parent-child relationship, which in turn affects the self-esteem and life satisfaction of children and adolescents (Bacikova-Sleskova et al., 2023).

The interaction between the role of fathers and mothers and the gender of their offspring adds another layer of complexity to the understanding of psychological control. In general, mothers have been perceived as more controlling and present in parenting (Ahmad et al., 2022; Gugliandolo et al., 2019; Hosley and Montemayor, 1997), while fathers tend to be more associated with the role of authority in the home (Hosley and Montemayor). These differences influence the way in which each parental figure can exercise psychological control in family dynamics. Several studies have shown more significant effects of parenting in dyads consisting of same-sex parents and children (Crouter et al., 1995; Murray et al., 2013; Van Lissa et al., 2019). This can be explained in part by the Family Gender Process Model perspective, where there is a more marked tendency to imitate the behavior of the same-sex parent (Endendijk et al., 2018). In addition, adolescents spend more time with same-sex parents and have closer relationships with them

(Laursen and Collins, 2009; Padilla-Walker et al., 2022). Paired comparisons between mothers and fathers revealed significant differences in all variables studied, except for antagonism (Bacikova-Sleskova et al., 2023).

According to the above, studies focusing on parenting processes from a gender perspective are few and far between, and many topics remain to be covered (Bacikova-Sleskova et al., 2023; Endendijk et al., 2018; Martínez-González et al., 2021). Despite the research carried out to date, knowledge about parental psychological control differentiated by the role played by both parents and how it manifests itself depending on the gender of the children is inconclusive. The aim of this study is to analyze parental psychological control behavior depending on the role of the parents and the gender of the adolescents. In turn, it seeks to answer the following research questions:

What are the specific manifestations of psychological control that adolescents perceive from their parents?

Are there differences in the perception of manifestations of psychological control according to the gender of the adolescent and the role of the parents?

1. What are the specific manifestations of psychological control that adolescents perceive from their parents?
2. Are there differences in the perception of manifestations of psychological control according to the gender of the adolescent and the role of the parents?

2. Materials and methods

2.1. Study design

This study used a quantitative approach, a descriptive relational cross-sectional and non-experimental design, considering that data collection was carried out in a structured and

sequential manner over a specific period and with a defined study population (Hernández-Sampieri and Mendoza, 2018).

2.2. Participants

The study involved 513 adolescents in their first, second, and third years of high school from 18 public and private educational institutions in the urban area of Cuenca, Ecuador. The sample size was calculated using the Master File of Educational Institutions (AMIE) database, with a confidence level of 95% and a margin of error of 3%. A multistage method was used to select these institutions, i.e., a number of 18 randomly selected institutions corresponding to each high school level was set through clusters. The sample consisted of 235 women and 278 men, aged between 14 and 18, with a predominance of 16-year-olds (33.3%). In terms of inclusion criteria, only those students who were part of nuclear families and who completed the entire questionnaire used in the study were considered. Participants over the age of 18 were excluded.

2.3. Instrument

Data from the Dependency-Oriented and Achievement-Oriented Psychological Control Scale (DAPCS) (García-Pérez et al., 2019) were used for the analysis. This is a 17-item questionnaire that assesses two types of parental psychological control: dependency-oriented (DPC, 8 items) and achievement-oriented (APC, 9 items). Participants indicate their agreement with statements measured on a 5-point Likert scale ranging from “Strongly disagree” to “Strongly agree.” In its validation in the Spanish population, the instrument showed adequate levels of reliability: for the DPC subscale, $\alpha = .90$ in fathers and $\alpha = .83$ in mothers; for the APC subscale, $\alpha = .94$ in fathers and $\alpha = .95$ in

mothers; and for the total scale, $\alpha = .93$ in fathers and $\alpha = .89$ in mothers.

2.4 Procedure

Before collecting the information, the respective consent for the use of the data and the informed consent of the parents were obtained to authorize the voluntary participation of their children in the research. The application of the instruments lasted 15 minutes. This research complied with the scientific and ethical requirements approved by the Health Bioethics Committee (COBIAS) of the Catholic University of Cuenca, which regulates research projects at the University of Cuenca, and was authorized by the local education authorities.

2.5 Data analysis

The sample was analyzed descriptively using mean and standard deviation indicators, and customized tables were constructed, initially considering the overall scores obtained by adolescents regarding their perception of their parents, to subsequently analyze the specific manifestations of psychological control exercised by fathers and mothers toward their sons and daughters. Specifically, after identifying that the data did not follow a normal distribution, the Mann-Whitney U test was used as an alternative to the Student's t-test to obtain the significance value that would allow conclusions to be drawn about the data; these analyses were performed using the SPSS Statistics program. Additionally, to determine the effect size, the refined database was processed in the JASP program, which made it possible to obtain this value

3. Results

3.1. Parental psychological control according to the parent

The analysis of the dimensions of parental psychological control according to the role of the parents indicated that both mothers and fathers show significant differences in the dimension

of control oriented towards dependence on their children. In this dimension, the average for mothers was 18.56 (SD= 6.27), while that for fathers was 17.37 (SD= 5.74). Furthermore, there is a significant difference between the two. With regard to achievement-oriented control, the averages for mothers and fathers are similar

(Mothers: $M= 16.68$, $SD= 7.94$; Fathers: $M= 16.63$, $SD= 7.51$) and no significant differences were found ($p= .86$) (Table 1).

3.2. General and specific manifestations of psychological control perceived by adolescents from their mothers

Table 2 shows the results of specific manifestations of psychological control exercised by mothers; it was found that this was perceived to a greater extent by male adolescents ($U=24841.0$; $p=.004$). Likewise, greater general manifestations of control directed toward achievement were recorded for males ($U=25201.5$; $p<.001$). The specific manifestations that reflect differences between the genders of adolescents were: “She shows that she loves me less if I get bad results in the activities I do,” “She makes me feel guilty if my performance is poor in the activities I do,” “She only shows that she loves me if I get good grades,” “She only respects me if I am the best at everything,” “She only gets along with me if I excel at everything I do,” “She loves me more if I pursue good results in the activities I do,” and “She is only proud of me if I succeed in exams”; men perceived greater control (Table 2).

With regard to general manifestations of dependence, no significant difference was identified ($p= .31$). For both men and women, the predominant manifestations were: “She feels disappointed if I don’t confide my problems to her” and “She interferes in my problems even when I prefer to solve them myself,” with no significant difference. In this dimension, the specific manifestations of psychological control: “She only shows me affection as long as we continue to do everything together” and “She only gets along with me if I trust her instead of my friends” were significantly higher in males ($p<.05$) (Table 2).

3.3. General and specific manifestations of psychological control perceived by adolescents from their parents

As shown in Table 3, psychological control exercised by parents was perceived to a greater extent by male adolescents ($U=23836.0$; $p<.001$). In addition, greater general manifestations of control directed toward achievement were recorded for males ($U=25364.5$; $p<.001$). The specific manifestations reflecting gender differences among adolescents were: “They make me feel guilty if I perform poorly in my activities,” “They only show they love me if I get good grades,” “They only respect me if I am the best at everything,” “They only get along with me if I excel at everything I do,” “He loves me more if I pursue good results in the activities I do,” and “He is only proud of me if I succeed in exams”; males perceived greater control.

With regard to general manifestations of dependence, significant differences were identified ($p= .03$), with male adolescents perceiving greater control. In both males and females, the predominant manifestations were: “He feels disappointed if I don’t confide my problems to him” and “He feels disappointed in me if I don’t share certain interests, ideas, thoughts, and concerns with him,” with no significant difference. In this dimension, the specific manifestations of psychological control: “He only shows me affection as long as we continue to do everything together,” “He interferes in my problems even when I prefer to solve them myself,” and “He only gets along with me if I trust him instead of my friends” were significantly higher in males ($p<.01$; $p<.001$) (Table 3).

Table 1: Parental psychological control according to parent
Source: Own elaboration (2024)

Dimension	Parent	Min	M	Máx	DT	p
Dependency-oriented control	Mother	8.00	18.56	49.00	6.27	<.001***
	Father	8.00	17.37	35.05	5.74	
Achievement-oriented control	Mother	9.00	16.68	58.00	7.94	.86
	Father	9.00	16.63	44.00	7.51	

Table 2: General and specific manifestations of psychological control perceived by adolescents from their mothers
Source: Own elaboration (2024)

Dimension	My father...	Women		Men		U	p	d
		M	DT	M	DT			
Dependency	General manifestations of dependency	16,72	5,44	17,91	5,94	26602,00	,03*	-0,11
	He feels disappointed if I don't confide my problems to him	2,58	1,29	2,74	1,26	29330,50	,10	-0,08
	I blame myself for no longer wanting to do things we used to enjoy together	1,86	1,21	1,86	1,18	31352,00	,78	-0,01
	It will make me feel guilty when I leave home to live independently	1,64	1,06	1,69	1,06	30472,00	,40	-0,04
	He feels disappointed in me if I don't share certain interests, ideas, thoughts, and concerns with him	2,22	1,28	2,16	1,23	31382,00	,64	0,02
	He is only happy with me if I ask him for advice exclusively.	2,04	1,20	2,17	1,34	30632,50	,48	-0,03
	He only shows me affection as long as we continue doing everything together.	2,34	1,42	2,72	1,53	27280,50	,006**	-0,14
	Interferes with my problems even when I prefer to solve them myself	2,43	1,30	2,73	1,32	27650,00	,009**	-0,13
	He only gets along with me if I trust him instead of my friends	1,60	1,04	1,89	1,18	27024,50	<,001***	-0,16
Achievement	General statements of achievement	15,40	6,90	17,64	7,85	25364,50	<,001***	-0,18
	He/she is unkind to me when I don't perform my tasks perfectly.	2,03	1,15	2,21	1,31	29800,00	,21	-0,06
	He is less attentive to me if I do not perform to my full potential in the activities I do.	1,90	1,15	2,02	1,22	30399,00	,33	-0,04
	Shows that they love me less if I get bad results in the activities I do	1,62	1,08	1,85	1,28	29214,50	,05	-0,09
	I feel guilty if I perform poorly in the activities I do	1,91	1,12	2,26	1,46	28172,50	,01*	-0,12
	He only shows he loves me if I get good grades	1,49	0,95	1,79	1,28	28330,00	,01*	-0,10
	They only respect me if I'm the best at everything	1,29	0,74	1,61	1,01	26434,50	<,001***	-0,18
	They only get along with me if I excel at everything I do	1,46	0,93	1,70	1,13	28459,00	,008**	-0,11
	He loves me more if I pursue good results in the activities I do	1,86	1,19	2,16	1,31	27639,00	,007**	-0,13
Total	He is only proud of me if I do well in my exams	1,93	1,34	2,16	1,38	28554,50	,02*	-0,11
	Total	32,01	10,18	35,62	11,97	23836,00	<,001***	-0,18

Table 3: General and specific manifestations of psychological control perceived by adolescents from their parents
Fuente: Own elaboration (2024)

Dimension	My father...	Women		Men		U	p	d
		M	DT	M	DT			
Dependency	General manifestations of dependency	16.72	5.44	17.91	5.94	26602.00	.03*	-0.11
	He feels disappointed if I don't confide my problems to him	2.58	1.29	2.74	1.26	29330.50	.10	-0.08
	I blame myself for no longer wanting to do things we used to enjoy together	1.86	1.21	1.86	1.18	31352.00	.78	-0.01
	It will make me feel guilty when I leave home to live independently	1.64	1.06	1.69	1.06	30472.00	.40	-0.04
	He feels disappointed in me if I don't share certain interests, ideas, thoughts, and concerns with him.	2.22	1.28	2.16	1.23	31382.00	.64	0.02
	He is only happy with me if I ask him for advice exclusively.	2.04	1.20	2.17	1.34	30632.50	.48	-0.03
	He only shows me affection as long as we continue doing everything together.	2.34	1.42	2.72	1.53	27280.50	.006**	-0.14
	Interferes with my problems even when I prefer to solve them myself	2.43	1.30	2.73	1.32	27650.00	.009**	-0.13
	He only gets along with me if I trust him instead of my friends	1.60	1.04	1.89	1.18	27024.50	<.001***	-0.16
Achievement	General statements of achievement	15.40	6.90	17.64	7.85	25364.50	<.001***	-0.18
	He/she is unkind to me when I don't perform my tasks perfectly	2.03	1.15	2.21	1.31	29800.00	.21	-0.06
	He is less attentive to me if I do not perform to my full potential in the activities I do	1.90	1.15	2.02	1.22	30399.00	.33	-0.04
	Shows that they love me less if I do poorly in my activities	1.62	1.08	1.85	1.28	29214.50	.05	-0.09
	I feel guilty if I perform poorly in the activities I do.	1.91	1.12	2.26	1.46	28172.50	.01*	-0.12
	He only shows he loves me if I get good grades	1.49	0.95	1.79	1.28	28330.00	.01*	-0.10
	They only respect me if I am the best at everything	1.29	0.74	1.61	1.01	26434.50	<.001***	-0.18
	They only get along with me if I excel at everything I do.	1.46	0.93	1.70	1.13	28459.00	.008**	-0.11
	He loves me more if I pursue good results in the activities I do	1.86	1.19	2.16	1.31	27639.00	.007**	-0.13
	He is only proud of me if I do well in exams	1.93	1.34	2.16	1.38	28554.50	.02*	-0.11
Total		32.01	10.18	35.62	11.97	23836.00	<.001***	-0.18

4. Discussion

The aim of this study was to analyze psychological control parenting behavior based on the role of parents and the gender of adolescents in Cuenca. Through analysis of the results, significant differences were identified in the psychological control perceived by children, who perceive this type of control to a greater extent in its two manifestations (dependence and achievement). In terms of differences between parents, it was found that fathers tend to score higher on achievement-oriented psychological control

The findings indicate that parents are perceived equally as controlling by their children, which contrasts with other studies suggesting that mothers exercise psychological control to a greater extent (Ahmad et al., 2022; Dwairy and Achoui, 2010; Gugliamdo et al., 2019). This may be the result of mothers' significant involvement in their children's daily lives, exposing them to a greater number of adaptive and maladaptive forms of control, which may explain why they score higher than fathers (Shek, 2008; Mastrotheodoros et al., 2019). However, the present study found notable variations in the manifestations of control they apply and the areas on which they focus.

Mothers are perceived by their children as more controlling, dependency-oriented, focused on decision-making, strengthening relational bonds, and trust. According to Bacikova-Sleskova et al. (2023), mothers are perceived as more intense, controlling, and confrontational, as well as more emotionally attached to their children. In terms of achievement-oriented control, it is evident that mothers exercise it to the same extent as fathers; however, it is mainly focused on the process of achievement. From the mother's role, parenting practices focus mainly on providing affection to children, which makes them more present in the process of achieving goals and more involved in their children's daily activities (Hosley and Montemayor, 1997).

For their part, fathers are perceived by their children as more controlling, achievement-oriented, and focused on results rather than on the process that has led to those results. This is consistent with other studies in which parents of adolescents score higher on measures that indicate a focus on the final effect or consequence of an activity or domain (Nazifi et al., 2023; Palacios-Madero et al., 2023; Soenens et al., 2010). With regard to dependency-oriented control, parents seem to exercise it from a position that is less emotionally linked and more focused on loyalty and maintaining the role of authority within the family hierarchy, by reinforcing the socioculturally constructed role of the father. Hosley and Montemayor (1997) state that the role of the father is broader than the traditional role focused on maintaining the family, as it is recognized that fathers perform significant functions as partners, caregivers, spouses, protectors, role models, moral guides, and teachers.

Additionally, sons generally perceived more control than daughters, which is consistent with the results obtained in other studies (Luebbe et al., 2014; Shek, 2008; Soenens et al., 2010), while other studies found no gender differences (Cui et al., 2014; Mabbe et al., 2016). Some research suggests that daughters perceive their relationships with their fathers better than sons do; moreover, sons tend to perceive both parents as more authoritarian than daughters do (Huang et al., 2019; Van Lissa et al., 2019). However, we consider it relevant to question the existence of more subtle manifestations of control that make it less identifiable in the case of daughters. According to Bacikova-Sleskova et al. (2023), daughters may experience more nuanced forms of control, which may have a different impact on their psychological adaptation than sons.

5. Conclusions

This study identified significant differences in the perception of parental psychological control based on the role of the parent and the gender of adolescents in Cuenca. It revealed that male adolescents perceive greater psychological control, both in its dependency-oriented and achievement-oriented dimensions, exercised by both parents. At the same time, a differentiation was evident in the specific manifestations of control, with mothers exercising control oriented toward emotional relationships and decision-making, while fathers tended to exercise control for the purposes of achievement and results, confirming the persistence of gender roles in parenting practices. The methodological approach implemented and the fulfillment of the objectives provide updated empirical evidence to the limited literature on parental psychological control from a gender perspective. The distinction of this article lies in the differentiated analysis by dyads (mother-son, mother-daughter, father-son, father-daughter), which provides a deep understanding of parenting practices.

Based on these findings, it is considered relevant to discuss the relationship between parenting and gender, taking into account that existing research on the subject is limited to reporting differences between sons and daughters, but does not analyze the reasons for these differences. In this sense, it is not only necessary to understand the presence of marked differences in parenting practices, but also to generate guidelines for projects focused on healthy parenting, in which psychological control as a parenting practice can be mitigated, in addition to promoting more equitable and less differentiated family dynamics. According to Wood and Eagly (2012), implementing more egalitarian attitudes toward gender allows for less differentiation between boys and girls; therefore, understanding and analyzing gender-differentiated parenting practices is essential to move toward more equitable and less stereotypical parenting.

6. Recommendations

Based on the research conducted, some limitations of the present study stand out, allowing us to outline useful guidelines for future research focusing on this topic. Initially, the present study focused on only two manifestations of control (Achievement and Dependence), so it is suggested that future work explore the differences in control between fathers and mothers using other tools or even make correlations with different types of control. Another limitation was the research approach, as it is considered that there are items that needed qualitative contrast (e.g., interviews with adolescents) to contextualize

the manifestation and analyze the differences between fathers and mothers in greater depth. Therefore, a mixed approach could be used, in which gender-differentiated manifestations of control are investigated and contextualized in a more feasible manner. Finally, this study analyzed a single variable (gender); contextual variables such as socioeconomic status and educational level are considered to mediate the relationship between gender and parental psychological control, so correlational studies with more variables would allow for a more in-depth approach.

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Integración de la sostenibilidad en las prácticas empresariales: un análisis bibliométrico de las tendencias y estructuras de investigación globales

Integrating Sustainability into Business Practices: A Bibliometric Analysis of Global Research Trends and Structures

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Integración de la sostenibilidad en las prácticas empresariales: un análisis bibliométrico de las tendencias y estructuras de investigación globales

Integrating Sustainability into Business Practices: A Bibliometric Analysis of Global Research Trends and Structures

Resumen

Este estudio proporciona un análisis bibliométrico exhaustivo de la literatura académica (2020-2025) sobre la intersección entre sostenibilidad y economía circular en las prácticas empresariales. Empleando 1,922 artículos de Scopus, la investigación mapea la estructura intelectual del campo mediante VOSviewer y Bibliometrix. Los hallazgos revelan un crecimiento exponencial en la investigación, geográficamente concentrada en el Reino Unido, China e Italia. El núcleo intelectual se ancla en “economía circular”, conectando clústeres temáticos de implementación operativa, innovación estratégica (incluyendo Industria 4.0) y gobernanza. Notablemente, el género emerge como un tema motor, señalando un creciente enfoque en la equidad social. El análisis identifica una brecha de investigación crítica en torno a los mecanismos de financiación innovadores para la transición circular. Este mapa basado en datos sirve como una guía crucial para investigadores y profesionales, destacando el conocimiento consolidado, los actores clave y las direcciones estratégicas para futuras indagaciones.

Palabras Clave: análisis bibliométrico, sostenibilidad, prácticas empresariales, economía circular, estructura intelectual.

Abstract

This study provides a comprehensive bibliometric analysis of the academic literature (2020-2025) on the intersection of sustainability and circular economy in business practices. Employing a robust dataset of 1,922 articles from Scopus, the research utilizes VOSviewer and Bibliometrix to map the field's intellectual structure. Findings reveal an exponential growth in research, concentrated geographically in the UK, China, and Italy. The intellectual core is anchored by “circular economy,” connecting key thematic clusters such as operational implementation, strategic innovation (including Industry 4.0), and governance. Notably, gender emerges as a motor theme, signaling a growing focus on social equity. The analysis identifies a critical research gap concerning innovative financing mechanisms needed to scale circular transitions. This data-driven map provides a crucial guide for researchers and practitioners, highlighting consolidated knowledge, key actors, and strategic directions for future inquiry in this vital domain of sustainable business.

Keywords: bibliometric analysis, sustainability, business practices, circular economy, intellectual structure.

1. Introducción

Las crecientes crisis mundiales de degradación ambiental y desigualdad social están remodelando fundamentalmente el panorama empresarial contemporáneo, lo que obliga a las empresas a trascender las métricas puramente financieras (Purwanto et al., 2025; Agencia Europea de Medio Ambiente, 2024). Este cambio de paradigma está impulsado por una poderosa coalición de partes interesadas que exigen que las empresas integren la gestión ambiental a largo plazo y la responsabilidad social en sus estrategias fundamentales (Pérez Estébanez y Sevillano Martín, 2025; Rafi, 2022). Esta exigencia ya no es meramente una cuestión de reputación, sino que se reconoce cada vez más como una piedra angular de la resiliencia financiera y la ventaja competitiva. Cada vez hay más pruebas empíricas que demuestran que un buen desempeño en materia medioambiental, social y de gobernanza (ESG) se correlaciona positivamente con una mayor innovación empresarial, mejores resultados financieros y un mayor valor global de la empresa (Dsouza et al., 2024; Tang et al., 2025; Yiheng et al., 2024). Las empresas que adoptan los principios de la economía circular (EC) no solo mitigan los riesgos medioambientales, sino que también abren nuevas fuentes de ingresos y crean cadenas de valor novedosas (Chen, 2020; Urbinati et al., 2020).

Un elemento central de esta transformación es la economía circular, una alternativa sistémica al modelo lineal tradicional que desvincula el crecimiento económico del consumo de recursos (Fundación Ellen MacArthur, 2024). Este cambio se ve acelerado por un potente impulso normativo. Marcos jurídicos ambiciosos, como la Directiva sobre la divulgación de información corporativa en materia de sostenibilidad (CSRD) y la Directiva sobre la diligencia debida en materia de sostenibilidad corporativa (CSDDD) de la Unión Europea, están estableciendo normas no negociables en materia de responsabilidad medioambiental y de derechos humanos que se extienden a nivel transnacional (Bokor, 2024; Schwartz, 2025). Al mismo tiempo, las políticas nacionales, como los requisitos

obligatorios de divulgación de información ESG de China o la taxonomía de finanzas verdes de la UE, ejercen una doble presión sobre las empresas, obligándolas a cumplir con normas medioambientales más estrictas para garantizar la financiación y mantener el acceso al mercado (Jiang y Ma, 2025; Kirschenmann, 2022). Como resultado, marcos como los criterios ESG se han vuelto cruciales no solo para evaluar el desempeño, sino también para orientar los flujos de capital hacia las empresas que demuestran prácticas sólidas de sostenibilidad (Tran y Khoa, 2025; Salinas et al., 2023).

A medida que ha aumentado el interés académico y práctico por estos temas, también lo ha hecho el volumen de literatura académica, creando un conjunto de conocimientos complejo y en rápida evolución (Lamba et al., 2024). Para navegar por este panorama, el análisis bibliométrico se ha convertido en una herramienta indispensable para sintetizar tendencias, trazar estructuras intelectuales e identificar fronteras de investigación. Estudios bibliométricos recientes confirman la importancia de desarrollar modelos de negocio sostenibles que pongan en práctica los principios de la EC, a menudo acelerados por la transformación digital y las tecnologías de la Industria 4.0. Como demuestran las investigaciones de Apriantero et al. (2024) y Dachry et al. (2024), tecnologías como la inteligencia artificial se integran cada vez más para mejorar la eficiencia de las prácticas circulares (Jobstreibizer et al., 2025). Sin embargo, la distribución geográfica de esta investigación es notablemente desigual. Si bien países como el Reino Unido, China y la India son los principales contribuyentes, persiste una disparidad significativa, ya que las economías avanzadas producen la mayoría de los estudios (Precious, 2025; Uwuigbe et al., 2025), lo que deja una necesidad crítica de una representación geográfica más diversa.

Además, estos análisis bibliométricos han sido fundamentales para identificar grupos temáticos específicos y lagunas críticas en la investigación.

Por ejemplo, estudios como el de Otasowie et al. (2024) han cartografiado la aplicación de los modelos de negocio de la EC en sectores específicos como la industria de la construcción, mientras que otros se han centrado en los retos únicos de la cadena de suministro alimentario (Akash et al., 2025; Lwesya y Achanta, 2024). Una conclusión recurrente en este conjunto de trabajos es la identificación de importantes lagunas en la investigación. Los académicos señalan constantemente la necesidad apremiante de investigar más en los mercados en desarrollo, donde el contexto para la implementación de los objetivos de sostenibilidad difiere enormemente (Jadhav y Sarangi, 2025; Ndlovu et al., 2025). Se han identificado lagunas en la necesidad de una innovación sistemática de modelos de negocio sostenibles (Minatogawa et al., 2022), la integración de tecnologías como el IoT y el blockchain (Song y Ahmad, 2024) y una exploración más profunda de las estrategias impulsadas por la tecnología para abordar la desigualdad (Prakash et al., 2025). Además, campos cruciales para la transición corporativa, como la contabilidad y la presentación de informes para la economía circular, siguen estando muy poco explorados (Maksymiv et al., 2024).

Si bien las revisiones bibliométricas existentes ofrecen valiosas instantáneas de subdominios específicos o identifican dispares lagunas (Razalli et al., 2024), se necesita un análisis exhaustivo que

no solo confirme las tendencias, sino que también visualice las profundas estructuras intelectuales que conectan las instituciones clave, los autores influyentes y los conceptos dominantes que dan forma a este debate global. Este estudio aborda esta necesidad proporcionando un mapa holístico y basado en datos del panorama actual del conocimiento.

Para abordar esta necesidad, el objetivo principal de este estudio es realizar un análisis bibliométrico exhaustivo de la literatura académica reciente (2020-2025) en la intersección de la sostenibilidad y la economía circular en las prácticas empresariales. Al trazar la evolución temporal, la distribución geográfica, el enfoque temático y la estructura intelectual del campo, esta investigación tiene como objetivo proporcionar un panorama sólido y basado en datos del panorama actual del conocimiento. En concreto, este análisis: (1) trazará la trayectoria de crecimiento de la producción académica; (2) identificará los países, instituciones y autores líderes que impulsan la agenda de investigación; (3) cartografiará los núcleos conceptuales fundamentales y sus interrelaciones mediante el análisis de palabras clave; y (4) visualizará el flujo de conocimiento entre los actores y temas clave. En última instancia, este estudio sirve como guía actualizada para que los investigadores y profesionales comprendan la arquitectura del campo, identifiquen las áreas de conocimiento consolidadas y señalen las lagunas críticas para futuras investigaciones académicas.

2. Materiales y métodos

Este estudio empleó un análisis bibliométrico cuantitativo para trazar rigurosamente la literatura académica relativa a la integración de los principios de sostenibilidad y economía circular en las prácticas empresariales. Se eligió este enfoque metodológico por su capacidad para procesar y analizar sistemáticamente un gran volumen de publicaciones académicas, proporcionando una visión general objetiva y basada en datos de la evolución, la estructura temática y las conexiones intelectuales de un

campo de investigación (Aria y Cuccurullo, 2017; Zupic y Čater, 2015).

Los datos se recopilaron meticulosamente de la base de datos Scopus, seleccionada por su amplia cobertura interdisciplinaria y sus sólidas características de metadatos, esenciales para el análisis bibliométrico. Para garantizar una alta relevancia y enfoque temáticos, se desarrolló y ejecutó una consulta de búsqueda booleana predefinida, dirigida a publicaciones dentro de

un marco temporal específico reciente (de enero de 2020 al presente, hasta 2025). La búsqueda se limitó estratégicamente a las áreas temáticas principales de Negocios, Administración y Contabilidad (BUSI), Economía, Econometría y Finanzas (ECON) y Ciencias Sociales (SOCI). Este enfoque garantiza que la bibliografía recuperada aborde directamente las dimensiones empresariales y socioeconómicas de la sostenibilidad, filtrando los estudios puramente técnicos o de ciencias ambientales que no se centran en las prácticas corporativas. Además, la búsqueda se limitó a artículos de revistas revisadas por pares (DOCTYPE, «ar»). La consulta de búsqueda final aplicada fue:

(TÍTULO-ABS-CLAVE(“desarrollo sostenible” O “sostenibilidad”) Y TÍTULO-ABS-CLAVE(“economía circular” O “modelo de negocio circular” O “cadena de suministro circular”) Y TÍTULO-ABS-CLAVE(“negocio” O “empresa” O “compañía” O “corporativo*”)) Y (LIMITAR (SUBÁREA, «BUSI»)) O LÍMITE-A(SUBÁREA, «ECON») O LÍMITE-A(SUBÁREA, «SOCI»)) Y (LÍMITE-A(TIPO-DOC, «ar»)).

Este procedimiento altamente enfocado y sistemático dio como resultado un conjunto de datos final de 1922 artículos, que constituyen la base empírica de este estudio.

El análisis bibliométrico de este conjunto de datos seleccionados se llevó a cabo utilizando una combinación de software especializado para garantizar una evaluación exhaustiva. El procesamiento de datos básicos y los análisis descriptivos iniciales se realizaron utilizando el paquete Bibliometrix R (versión 3.2.1) dentro del entorno RStudio. Para la visualización de la red, que es crucial para revelar las estructuras intelectuales subyacentes, se empleó VOSviewer (versión 1.6.20) debido a sus capacidades superiores para construir y visualizar grandes mapas bibliométricos (van Eck y Waltman, 2010). El proceso analítico incluyó: (1) estadísticas descriptivas para caracterizar el crecimiento de las publicaciones y la distribución geográfica; (2) análisis de coautoría para mapear las redes de colaboración entre países; y (3) análisis de palabras clave para identificar los temas centrales de investigación, detectar grupos conceptuales y visualizar la estructura intelectual del campo.

3. Resultados

El análisis bibliométrico de 1922 artículos publicados entre 2020 y 2025 revela un panorama de investigación caracterizado por un crecimiento exponencial, patrones de colaboración geográfica distintivos y una estructura intelectual claramente definida. El análisis de la producción académica, presentado en la figura 1, demuestra una aceleración espectacular del interés por la investigación. Este aumento no es casual, sino que se corresponde con varios acontecimientos mundiales fundamentales. El periodo coincide con la intensificación de la aplicación de las políticas derivadas del Acuerdo de París y la Agenda 2030 para el Desarrollo Sostenible de las Naciones Unidas. Más concretamente, el potente impulso normativo de marcos como el Pacto Verde Europeo (anunciado en 2019) y las estrategias nacionales de China sobre economía circular han creado una fuerte demanda institucional de investigación que pueda orientar

la transformación empresarial. Este impulso impulsado por las políticas, junto con la creciente presión de los inversionistas para el cumplimiento de los criterios ESG (medioambientales, sociales y de gobernanza), ha convertido la integración de la sostenibilidad y la circularidad de un tema nicho en un imperativo estratégico y económico, catalizando el crecimiento exponencial de las publicaciones académicas que observamos.

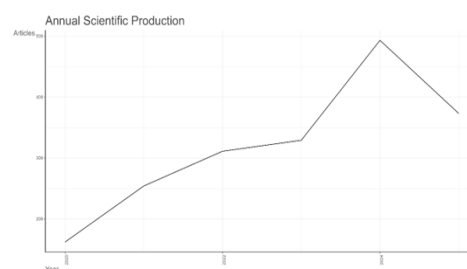


Figura 1: Producción científica anual sobre sostenibilidad y economía circular en las empresas (2020-2024).

Fuente: Elaborado por el autor a partir de datos de Scopus y la herramienta Bibliometrix (2025).

La estructura global de esta investigación, visualizada en la red de coautoría por países de la figura 2, se define por una comunidad multiclúster e interconectada. El liderazgo de países como el Reino Unido, China e Italia no es arbitrario, sino que refleja profundos factores estructurales. Los buenos resultados del grupo europeo (Reino Unido, Italia, España, Alemania) pueden atribuirse directamente al sólido marco institucional y a la importante financiación de la investigación proporcionada por la Unión Europea, en particular a través de su Plan de Acción para la Economía Circular y el programa Horizonte Europa, que incentivan en gran medida la colaboración transfronteriza en estos temas. La fortaleza histórica del Reino Unido en materia de infraestructura de investigación consolida aún más su papel como centro neurálgico. La prominencia de China es el resultado de una política nacional descendente que da prioridad a la economía circular como solución para la seguridad de los recursos y la contaminación, creando un enorme ecosistema de investigación nacional. Por el contrario, la densidad relativamente menor de colaboración en regiones como América Latina sugiere que, si bien se está llevando a cabo investigación, esta puede estar impulsada por retos más localizados y menos integrada en las redes globales de financiación y políticas que alimentan a los clústeres líderes.

Al profundizar en el núcleo intelectual, el mapa temático de la figura 3 ilustra una estructura muy centrada. Conceptos fundamentales como «sostenibilidad», «innovación» y «economía

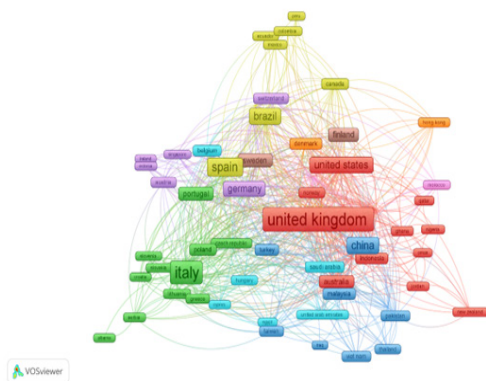


Figura 2. Red de coautoría por países (2020-2025). Mínimo de 5 documentos por país.

Fuente: Elaborado por el autor a partir de datos de Scopus y la herramienta VOSviewer (2025).

ambiental») muestran una alta centralidad, conectando todo el campo. Las áreas de investigación especializadas y bien desarrolladas, como «economía circular» y «cadenas de suministro», se identifican como temas nicho, mientras que los componentes esenciales, como «desarrollo sostenible» y «reciclaje», funcionan como temas básicos. Las relaciones conceptuales se detallan aún más en la red de palabras asociadas de la figura 4, que confirma la «economía circular» como el principal paradigma organizativo. Desde este eje central se ramifican distintos grupos temáticos que conectan aspectos operativos como la «gestión de residuos», facilitadores tecnológicos como la «Industria 4.0») y marcos estratégicos que involucran a las «partes interesadas» y las «políticas», lo que dibuja un panorama de un área de investigación sofisticada e integrada.

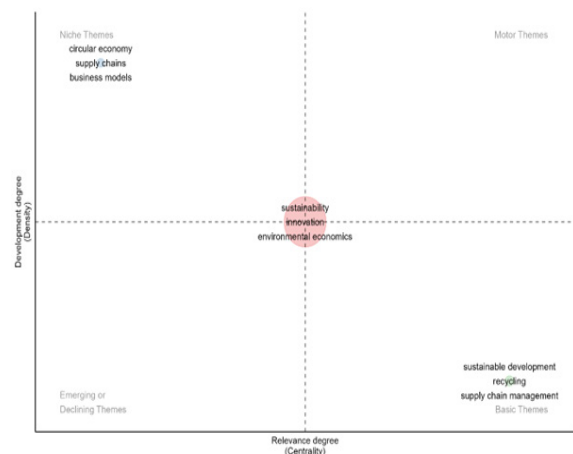


Figura 3. Mapa temático basado en el análisis de coocurrencia de palabras clave (2020-2025).

Fuente: Elaborado por el autor a partir de datos de Scopus y la herramienta Bibliometrix (2025)

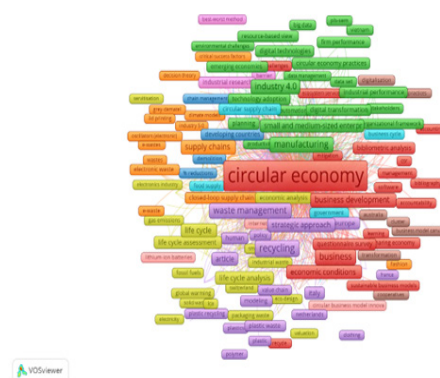


Figura 4. Red de palabras asociadas de las palabras clave de los autores que muestra los grupos temáticos.

Fuente : Elaborado por el autor a partir de datos de Scopus y la herramienta VOSviewer (2025)..

Para sintetizar estos elementos estructurales, el gráfico de tres campos (diagrama de Sankey) de la figura 5 visualiza el flujo de conocimiento desde las instituciones líderes, pasando por los autores más prolíficos, hasta los temas de investigación dominantes. Este diagrama ilustra de manera contundente cómo un selecto grupo de universidades canaliza su investigación a través de autores clave, cuyo trabajo colectivo contribuye de manera predominante a los pilares conceptuales fundamentales del campo, como «economía circular», «sostenibilidad» y «desarrollo sostenible», junto con corrientes significativas en áreas aplicadas como «Industria 4.0» y «gestión de la cadena de suministro». Esta visualización proporciona un mapa claro y convincente de la cadena de producción intelectual, destacando las instituciones y los académicos fundamentales que dan forma al discurso académico mundial.

Por último, un análisis más detallado identifica los autores y publicaciones específicos que han tenido un impacto más significativo. La tabla 1 enumera los diez autores más prolíficos, cuyas contribuciones sostenidas son fundamentales para el desarrollo del campo. Autores como Bocken, Garza-Reyes y Sehnem lideran en términos de volumen de publicaciones, lo que

los convierte en figuras centrales en el debate académico actual. La resonancia intelectual de los estudios clave se muestra en la tabla 2, que presenta los diez artículos más citados dentro del conjunto de datos. Estos trabajos tan influyentes de académicos como Esmaeilian, Bag y Corvellec sirven como puntos de referencia fundamentales, ya que dan forma a la dirección teórica y empírica de todo el ámbito de investigación.

Tabla 1. Los 10 autores más productivos en materia de sostenibilidad y economía circular en los negocios (2020-2025).
Fuente : Elaborado por el autor a partir de datos de Scopus (2025).

Autores	Artículos	Artículos fraccionados
BOCKEN NMP	18	5.016666667
GARZA-REYES JA	17	3.783333333
SEHNEM S	15	4.276190476
BAG S	14	4.6
KIRCHHERR J	14	4.166666667
KUMAR A	12	2.791666667
SCARPELLINI S	12	4
KAZANCOGLU Y	11	2.683333333
KUMAR MANGLA SK	11	2.276190476
AARIKKA-STENROOS L	10	3.45

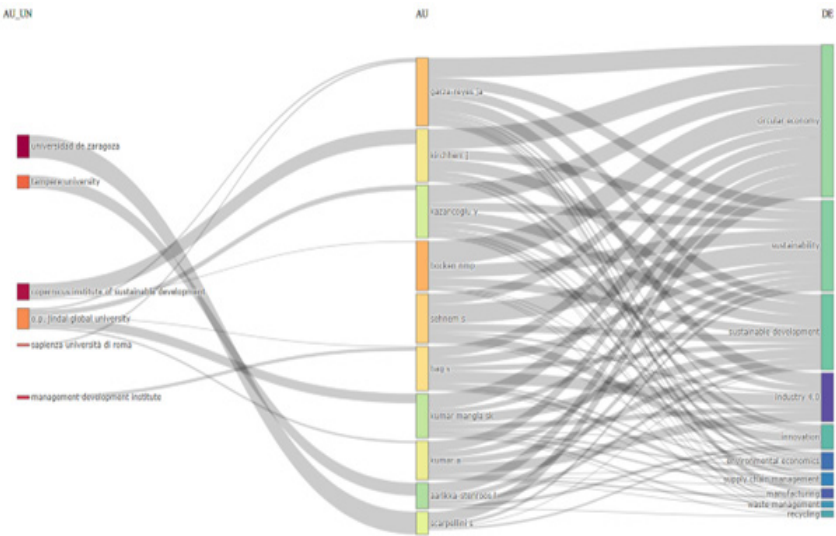


Figura 5. Gráfico de tres campos que ilustra el flujo de conocimientos entre las principales instituciones (AU_UN), autores (AU) y palabras clave (DE).
Fuente: Elaborado por el autor a partir de datos de Scopus y la herramienta Bibliometrix (2025).

Tabla 2. Los 10 documentos más citados sobre sostenibilidad y economía circular en los negocios (2020-2025).
Fuente: Elaborado por el autor a partir de datos de Scopus (2025).

Artículo	DOI	Total de citas	TC por año	CT normalizadas
ESMAEILIAN B, 2020, Resour. Conserv. Recycl.	10.1016/j.resconrec.2020.105064	676	112.66667	7.39047105
BAG S, 2021, Previsión tecnológica. Cambio social.	10.1016/j.techfore.2020.120420	596	119.2	9.04703281
CORVELLEC H, 2022, J. Ind. Ecol.	10.1111/jiec.13187	577	144.25	14.5690509
KRISTOFFERSEN E, 2020, J. Bus. Res.	10.1016/j.jbusres.2020.07.044	524	87.333333	5.72870833
FATIMAH YA, 2020, J. Clean. Prod	10.1016/j.jclepro.2020.122263	511	85.166667	5.58658388
YADAV G, 2020, J. Clean. Prod.	10.1016/j.jclepro.2020.120112	490	81.666667	5.35699825
CENTOBELLI P, 2020, Estrategia empresarial y medio ambiente.	10.1002/bse.2466	471	78.5	5.14927791
CHAUHAN C, 2022, Previsión tecnológica. Cambio social.	10.1016/j.techfore.2022.121508	451	112.75	11.3875944
BAARS J, 2021, Nat. Sustain	10.1038/s41893-020-00607-0	428	85.6	6.49686249
BAG S, 2021, Int. J. Prod. Econ.	10.1016/j.ijpe.2020.107844	428	85.6	6.49686249

4. Discusión

Este análisis bibliométrico ha permitido trazar un mapa del panorama de la investigación sobre sostenibilidad y economía circular en el ámbito empresarial, revelando un campo caracterizado por un crecimiento explosivo y una estructura intelectual sofisticada e interconectada. Los resultados confirman que lo que antes era un tema minoritario se ha convertido en un pilar fundamental de la estrategia empresarial moderna, impulsado por una confluencia de presiones normativas, demandas del mercado e investigación académica. En este debate se interpretan estos resultados segmentándolos en las tendencias de investigación observadas y las estructuras intelectuales subyacentes.

4.1. Tendencias de investigación: un campo en rápida consolidación

El aumento exponencial de las publicaciones desde 2020 (Figura 1) es un hallazgo fundamental, que indica una masa crítica de actividad académica que refleja directamente la intensificación de la agenda política mundial. Esto sugiere que la comunidad académica está respondiendo activamente a las necesidades del mundo real. Sin embargo, la concentración geográfica de esta producción, con centros

en el Reino Unido, China e Italia (Figura 2), también revela una tendencia significativa: una posible brecha de conocimiento en regiones con contextos institucionales diferentes. La implementación de una economía circular (EC) en las economías emergentes requiere un enfoque fundamentalmente diferente debido a un conjunto único de barreras que no son tan prominentes en los países desarrollados (Cantú et al., 2021; Liu, 2025). Entre los principales retos se encuentran importantes deficiencias institucionales, como la falta de marcos normativos sólidos, la aplicación inconsistente de las políticas y los limitados incentivos financieros, que desincentivan las inversiones a largo plazo en la EC (Zighan et al., 2025). Además, las deficiencias infraestructurales, desde sistemas de gestión de residuos inadecuados hasta infraestructuras digitales y financieras poco desarrolladas, dificultan gravemente la logística de los modelos circulares. Es fundamental señalar que el amplio sector informal, a menudo responsable de la recolección y el reciclaje, suele ignorarse en los discursos sobre la EC, que son verticalistas y se centran en la tecnología, lo que crea una desconexión entre las políticas y la realidad sobre el terreno (Clube y Tennant, 2023; Liu, 2025). La agenda de investigación actual parece estar muy condicionada por los contextos

de las economías desarrolladas, lo que limita la aplicabilidad directa de los resultados a los mercados emergentes sin una cuidadosa adaptación.

4.2. Estructuras intelectuales: un ámbito sofisticado e interconectado

Más allá de las tendencias de crecimiento, el análisis revela un dominio intelectual maduro en el que la «economía circular» se ha consolidado como el paradigma organizativo central (figuras 3 y 4). La estructura se caracteriza por tres grupos clave: implementación operativa, innovación estratégica y marcos de gobernanza. Es fundamental destacar que la fuerte conexión dentro de nuestros datos con el grupo de «innovación estratégica», que incluye términos como «Industria 4.0», pone de relieve una idea fundamental: las tecnologías modernas no son solo herramientas, sino facilitadores esenciales para la economía circular. Tecnologías como el Internet de las cosas (IoT), el análisis de big data y la inteligencia artificial están transformando la implementación de la EC al permitir el seguimiento en tiempo real, optimizar las cadenas de suministro de ciclo cerrado y mejorar la toma de decisiones gerenciales (Ciano et al., 2025; Dolci et al., 2024). La fabricación aditiva facilita la producción bajo demanda con materiales reciclados, mientras que la cadena de bloques puede mejorar la trazabilidad y la transparencia (Uriarte-Gallastegi et al., 2022). Sin embargo, para que estas tecnologías impulsen una transformación verdaderamente sostenible, deben integrarse en un ecosistema colaborativo de innovación circular abierta, evitando centrarse exclusivamente en ganancias de eficiencia puramente incrementales (Sáenz De Viteri et al., 2025).

Además, la aparición del género como tema motor en nuestro mapa bibliométrico supone una evolución sofisticada del concepto de EC, que va más allá de las consideraciones puramente tecnoeconómicas para abarcar la sostenibilidad social. Aunque a menudo se pasa por alto, la

EC tiene profundas implicaciones sociales, especialmente en lo que respecta a la equidad y el desarrollo inclusivo. Un marco emergente de «economía circular social» aboga por dar prioridad a la satisfacción de las necesidades humanas fundamentales y garantizar una «transición justa» que incluya a los grupos vulnerables (Clube y Tennant, 2023; Villalba-Eguiluz et al., 2023). Este enfoque centrado en el ser humano hace hincapié en que los modelos de EC en las economías emergentes no deben replicar los patrones explotadores de la economía lineal. En lugar de centrarse únicamente en soluciones tecnocráticas impulsadas por el mercado, una EC verdaderamente sostenible debe integrar los principios de la economía social y solidaria, crear empleos dignos y distribuidos equitativamente, y reconocer formalmente las contribuciones de los trabajadores del sector informal, que a menudo se encuentran en la primera línea de las actividades circulares (Liu, 2025; Akash et al., 2025). Descuidar estas dimensiones sociales conlleva el riesgo de crear sistemas circulares que sean respetuosos con el medio ambiente, pero socialmente injustos. Por último, el gráfico de tres campos (Figura 5) y el análisis de los principales autores y artículos (Tablas 1 y 2) confirman que toda esta compleja estructura está siendo construida y difundida por una red definida de instituciones y académicos influyentes, lo que crea un discurso académico global coherente.

4.3. Limitaciones del estudio

Los resultados están sujetos a limitaciones. El análisis utilizó únicamente la base de datos Scopus; la inclusión de otras bases podría arrojar resultados ligeramente diferentes. El enfoque en documentos de tipo «artículo» en inglés excluye otras formas de producción académica y la literatura no inglesa. El análisis bibliométrico mapea los patrones y estructuras de publicación, no la calidad de la investigación ni su impacto en el mundo real. Las conclusiones reflejan la actividad académica documentada basada en estos parámetros

5. Conclusiones e investigaciones futuras

Este análisis bibliométrico ha revelado un campo de investigación definido por un crecimiento dinámico y un núcleo intelectual en consolidación. La comunidad académica está claramente comprometida con la estructuración del conocimiento en torno a los paradigmas centrales de la «economía circular» y la «sostenibilidad». Sin embargo, esta fase de consolidación se caracteriza por una importante concentración geográfica, lo que plantea el riesgo de crear teorías que pueden no ser universalmente aplicables. La principal implicación práctica de estos hallazgos es que, para los directivos y los profesionales, ya no es opcional familiarizarse con esta bibliografía. La interconexión entre las operaciones, la estrategia y la gobernanza significa que la integración exitosa de la sostenibilidad requiere un enfoque holístico. Para los responsables políticos, nuestro análisis destaca el éxito de la financiación específica y las señales reguladoras sólidas (como se observa en Europa y China) a la hora de fomentar los ecosistemas de investigación, lo que proporciona un modelo para otras regiones.

Para aprovechar este trabajo y abordar sus limitaciones, las investigaciones futuras deben dar prioridad a varias vías. En primer lugar, sigue siendo fundamental abordar las disparidades geográficas; es necesario fomentar colaboraciones internacionales inclusivas para captar contextos diversos. En segundo lugar, es vital una integración más profunda de los Objetivos de Desarrollo Sostenible (ODS) más allá de un marco contextual en un marco analítico básico.

Por último, y lo que es más importante, el mapa del panorama intelectual de este estudio revela que, si bien se ha investigado ampliamente el qué (modelos de negocio circulares) y el cómo (facilitadores digitales), el «cómo financiarlo» sigue siendo una laguna importante en la

investigación. Los académicos destacan que la investigación sobre la financiación de la economía circular aún es incipiente, ya que a menudo se ha descuidado el papel de los sistemas financieros en la aceleración de la transición (Meili y Stucki, 2023). Por lo tanto, las investigaciones futuras deben abordar esta laguna crítica. Existe una necesidad urgente de estudios sobre mecanismos e instrumentos financieros innovadores, como los bonos verdes y los préstamos vinculados a la sostenibilidad, específicamente adaptados a los perfiles de riesgo únicos de los modelos de negocio de la EC (Kumar et al., 2025). Las investigaciones futuras también deberían explorar el potencial de la financiación combinada para movilizar capital privado para las innovaciones de la EC, en particular para las pymes que tienen dificultades con la financiación tradicional (De la Cuesta-González y Morales-García, 2022).

Además, el camino a seguir requiere el desarrollo de nuevos parámetros y marcos de evaluación de riesgos que permitan a las instituciones financieras evaluar adecuadamente las empresas circulares, que a menudo tienen propuestas de valor y modelos de flujo de caja diferentes a los de sus homólogas lineales. Dado que este estudio allana el camino para nuevas preguntas empíricas, las investigaciones futuras podrían explorar: ¿Cuáles son las barreras institucionales específicas que impiden la adopción de modelos de negocio circulares en las economías emergentes? ¿Cómo se pueden aplicar los principios de las «finanzas circulares» para apoyar a las pymes en su transición? ¿Y cómo se aplican los marcos teóricos dominantes identificados en este análisis en diferentes contextos culturales y normativos? Al seguir estas vías, la comunidad académica puede garantizar la relevancia y el impacto continuos de la investigación sobre uno de los retos empresariales más críticos de nuestro tiempo.

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Knowledge, citizenship, and education for the 21st century

Saberes, ciudadanía y educación para el siglo XXI

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Knowledge, citizenship, and education for the 21st century

Saberes, ciudadanía y educación para el siglo XXI

Resumen

El objetivo del artículo es describir los saberes para la ciudadanía que desarrollan los/las estudiantes del nivel secundario del partido de San Martín, Buenos Aires. Se argumenta que los/las jóvenes que concurren a las escuelas adquieren saberes para integrarse como ciudadanos/as en una sociedad que tiende hacia la exclusión y negación de derechos. Para ello, trabajamos con técnicas de investigación cualitativa que involucró el desarrollo de entrevistas en profundidad a estudiantes realizadas desde 2021 hasta 2023. Los resultados muestran que los/las jóvenes valoran la escuela puesto que allí se educan para saber ser alguien en la vida, saber hacer y saber estar al ritmo de la sociedad actual. La importancia social del conocimiento, desde la perspectiva de los sujetos, está en que aquello que se aprende en la escuela es la base para afirmarse como ciudadanos/as, ejercer sus derechos e integrarse en la sociedad.

Palabras clave: ciudadanía, escuela, exclusión, saberes, estudiantes.

Abstract

The aim of this article is to describe the forms of citizenship knowledge developed by secondary school students in the district of San Martín, Buenos Aires. It is argued that young people attending these schools acquire knowledge that enables them to integrate as citizens into a society increasingly marked by exclusion and the denial of rights. We employed qualitative research techniques, including in-depth interviews with students conducted between 2021 and 2023. The results show that young people value school as a space where they learn how to be someone in life, how to act, and how to coexist in step with contemporary society. From the students' perspective, the social significance of knowledge lies in the fact that what is learned at school serves as a foundation for affirming themselves as citizens, exercising their rights, and integrating into society.

Keywords: citizenship, school, exclusion, knowledge, students.

1. Introduction

The reconfiguration of global capitalism (Harvey, 2021) in its current neoliberal form (Brown, 2021) affects various areas of personal and social life. This can be seen in how we are citizens today. There has been a shift from a disciplinary structure of citizens dependent on a sovereign to the exaltation of individual freedoms to act as active (Fistteti, 2004), competitive, entrepreneurial, and self-demanding (Chul Han, 2017) citizens according to market logic. From this perspective, citizenship is produced within a framework of power relations (Foucault, 1988) in which the interests of economic power are brought into play alongside neoliberal discourses and logics that exclude individuals and the struggles of those seeking to improve their material living conditions. In this scenario, it becomes essential to analyze the production of citizenship in schools, as it is in and from this institution that knowledge, teaching, and learning are developed that shape ways of thinking and being a citizen with rights in order to keep pace with a changing society at the global and local levels

Research addressing the relationship between citizenship and education (Cox & Castillo, 2015; Núñez, 2023; Siede, 2023) shows how, within the framework of modern democracy, there has been a shift from a focus on civic education to education for citizenship. Shapiro (2020) states that “changes in the name [of the subject] have gone hand in hand with changes in prescribed content, pedagogical approaches, and training expectations, occupying different places in the organization of secondary education, but without disappearing” (p. 105). In other words, the 19th-century school, whose sole function was to instruct individuals in moral values and civic duties (Durkheim, 1997, 2003) with whom a national and civilized community would be formed (Sarmiento, [1845] 2018), became in the 21st century an educational institution that trains students for political participation (Siede, 2023), the exercise of rights, and the recognition of diversity.

Currently, research characterizes the dimensions of citizenship production in schools. These refer to the structures and curricular content of citizenship education (Cox et al., 2014), the practices of sociability and/or coexistence of young people in the school environment (Litichever, 2012; Núñez, 2019), the ways of participating and engaging in politics at school (Larrondo, 2019; Siede, 2023), Comprehensive Sex Education (ESI), the environment, gender and diversity, expectations for the future (Núñez, 2023), and calls for competitiveness, autonomy, and self-government in performance-based societies (Chul Han, 2017) that require active and entrepreneurial citizens (Cruikshank, 2007). These dimensions take different forms and are strained by exclusion and social inequality in contexts of urban poverty.

This background provides the basis for rethinking the knowledge of citizenship currently being developed in schools. Knowledge refers to a set of discursive and non-discursive practices (Foucault, 1979) that are produced in specific socio-historical contexts. Knowledge is by no means the result of a “search for truth,” but instead develops within a framework of power relations (Deleuze, 2021; Foucault, 1988), producing discursive formations about something, for example, the production of citizenship in schools. In this sense, citizenship knowledge involves teaching, learning, ways of thinking, doing, saying, and being a citizen today.

We propose that knowing how to be someone else refers to a process of subjectivation (Deleuze, 2017) that involves the desire to be recognized as a social subject and citizen (Balibar, 2013). Knowing what to do articulates knowledge that enables subjects to act in specific ways in everyday life. Every action and practice involves knowledge (Foucault, 1979). Likewise, knowing how to keep pace with society enables us to think of the citizen-subject within the social fabric (Bourdieu, 2010). This implies the development of certain types of knowledge that are important for integrating into a society that excludes those who are “not in step” with the times.

From this perspective, this article aims to describe the school-based citizenship knowledge that secondary school students learn in contexts of urban poverty in the district of San Martín, Buenos Aires. The hypothesis we propose to develop is that, in school, students develop knowledge that they can integrate into a society

that tends toward exclusion and the denial of rights. The knowledge, teachings, and learning that take place in school shape ways of being a citizen insofar as they configure subjectivities with specific ways of thinking, speaking, and acting regarding how to relate to and integrate into society with *others*.

2. Materials and methods

The methodology design involved conducting in-depth interviews with secondary school students in the district of San Martín, Buenos Aires province. This technique is characterized as a form of interpersonal conversation. This communicative process involves “having a face-to-face encounter” (Archenti, 2012, p. 215) to learn about the subjects’ perspectives on a particular topic, experience, situation, and/or event. That is, the meanings that students give to the exercise of citizenship from the perspective of schooling, as well as the tensions between the knowledge produced in schools and neighborhood and personal situations. In this article, we focus on the results of two lines of inquiry, organized in Table 1, along with the items that served as triggers for dialogue.

Table 1. Areas of inquiry and triggers for the interviews
Source: Authors (2021).

Areas	Triggers
School	- History of how they came to school.
	- Choice of school.
	- Places, activities, and/or moments that you like or dislike about school.
	- Importance or lack thereof of going to school.
Knowledge	- Subjects they like, subjects they dislike
	- Topics they would like to be taught.
	- Subjects and/or topics related to their rights.

These themes and triggers served as the basis for developing the in-depth interviews, but they were not limiting factors. Instead, attentive

listening was key to reformulating questions and even developing new ones on the spot, as topics arose in the dialogue. In this article, we analyze students’ statements about the citizenship knowledge they develop in schools. To this end, 48 in-depth interviews were conducted with students from a sample with equal proportions of males and females aged 11 to 18, students in the first, third, and sixth years of three state-run secondary schools in the district of San Martín, referred to as EES A, EES B, and EES C.

The interviews were audio-recorded with the students’ consent. The duration varied by year. With first-year students, it was possible to maintain continuous dialogues lasting between 30 and 40 minutes, while with third- and sixth-year students, the interviews lasted between 40, 60, and up to 80 minutes.

All data from the interviews were processed, organized, and coded using the AtlasTi software. We analyzed the information using the constant comparison method (Glaser & Strauss, 1967). This involved carefully reading the data to identify similarities, differences, and patterns across the information set. This process resulted in the reduction of codes and the emergence of primary and/or central categories that form the basis for the production of data-based theory (Glaser & Strauss, 1967). In this article, the results refer to the school-based citizenship knowledge that young people attending secondary schools in contexts of urban poverty learn and value, as we will describe below.

3. Results and discussion

The knowledge, teachings, and learning transmitted in school shape subjectivities with specific ways of thinking, relating to others, and integrating into society as citizens. We observe this in students' statements, which express at least three ways they acquire knowledge for citizenship today. We refer to "knowing how to be someone" in life, "knowing what to do" to be a citizen, and "knowing how to keep up with society." Table 2 summarizes research on the citizenship knowledge students develop in and from school.

In a series of statements, students express the importance of school in their personal and social lives. Young people view and experience this institution as a space for learning and the circulation of knowledge (Grinberg, 2016), but also as a place where they can explore their interests and express their desires in a society that tends toward exclusion, as we will analyze below.

3.1. Knowing how to be someone else in life

Students see education as an opportunity to chart possible futures (Berardi, 2019) that will allow them to assert themselves as citizens and improve their living conditions. In this sense, a student starting secondary school expresses the

importance of studying in order to "be someone in life"

We have to study because we have to build a future, no matter what. A prepared future. If you don't study, well, you've screwed up your life. Moreover, if you study, you will be someone in life. You can be someone else in life, someone else who can work and all that (Personal communication, male student, 12 years old, EES C, 1st year, May 5, 2023).

The student's statement expresses a double meaning about education. The first refers to the fact that students find in studying the possibility of building a prepared future, of being able to "become someone" in life, which involves achieving a decent job amid profound socio-educational inequalities, exclusion, precariousness, and unemployment. For all this, study is necessary, insofar as, according to what he himself highlights as part of the double meaning, "without study you cannot achieve anything," life would be ruined. Amid this tension between study as a possibility of "being someone" and the risk of "being nothing," the desire to "have a better life" gains strength, as one student affirms:

For me, school is mostly about teaching and helping kids understand and lead better lives. They [the teachers] try to teach them, and they give them breakfast. They try to help kids have a better life (Personal communication, male student, 14 years old, EES B, 3rd year, March 27, 2023).

Table 2. Matrix of categories with key results
Source: Authors based on results of student interviews (2021-2023).

Citizenship knowledge	Student statements
Knowing how to be someone	"If you study, you will be someone in life." "Being someone who can work." "Be someone who knows what they're talking about, knows history, knows math. Don't be a dunce."
Knowing what to do	"School helps you know what you have to do when you grow up." "School helps people who don't know what to do." "At school, you learn what you are going to do or what you will be able to do."
Knowing how to keep up with society	"School is important to me because it gives you the tools to integrate into society in a certain way." "With a good education, you're more likely to be able to keep up with this society that is advancing so quickly." "School prepares you to keep up with what's going on and to be better informed."

These statements in no way mean that school only makes sense in terms of what will happen later. On the contrary, personal fulfillment and having a better life, framed in the context of becoming a citizen, are presented as events that insist on time, “gathering and reabsorbing the past and the future” (Deleuze, 1989, p. 9).

In societies that tend toward exclusion, students think of and experience school as a means to become “someone with a developed mind and knowledge of things,” because they believe that these are the conditions for integrating into society. The words of a student in his final year of high school reflect this sentiment:

For me, school is primarily for developing the mind and the minds of those who will study. So that when students turn 18, they... how can I put it? So that the person who goes to school can enter society. Know things and have an understanding of things, of everything in itself. Know how to read, know how to listen, many things (Personal communication, male student, 17 years old, EES B, 6th year, July 12, 2022).

From the students’ perspective, “developing the mind, having knowledge and understanding of things, as well as knowing how to read and listen,” among other things, becomes a support for social integration. These statements express how individuals become citizens in and through school, while also extending beyond that institution, opening up possibilities and doors in society in general to “have a dignified life.” One student explains it this way:

[School] kind of opens up possibilities for you when you are older. Like I told you, having a house, not going without. To have a dignified life, which you might not have if you do not study. It opens doors. It also allows you to be someone with a good head on your shoulders. To be someone who knows the things you are talking about, knows history, and knows math. Not a dunce (Personal communication, female student, 17 years old, EES B, 6th year, June 14, 2022).

“Being someone involves the way in which each person ‘becomes himself or herself a subject’ (Foucault, 1988, p. 3). In corporate society (Foucault, 2001), which has now become management and/or managerial societies (Collet & Grinberg, 2021), “becoming a subject in order to become someone requires” learning, acquiring,

and/or assuming attitudes and skills (Grinberg, 2009; Langer & Levy, 2009) that allow one to adapt and keep up with the pace of rapid social changes and requirements, such as the constant flexibilization of labor, which one day has subjects “doing everything” with the uncertainty that at any moment they may be displaced to “doing nothing” (unemployed).

From this perspective, students find in school the possibility of being someone with a head on their shoulders, that is, with disciplinary knowledge such as history and mathematics, as well as knowledge about “the things that are talked about” and experienced daily, which involves “knowing how to do everything” and all the time, as we will describe in the following section

3.2. Knowing what to do to be a citizen

Contrary to certain discourses that attempt to position the purpose of school as no longer being the transmission of knowledge and learning (Carneros, 2018), students in urban neighborhoods insist on and reaffirm the importance and place that knowledge has in and for their lives, insofar as it teaches them things they will need in their daily lives and work. This is supported by a student when referring to the disciplinary knowledge developed in school:

Math is practical when you go shopping, so you can calculate things correctly. In science, you learn all about animals and plants. Studying is useful (Personal communication, female student, 15 years old, EES C, 3rd year, November 30, 2021)

This student, like others, values the disciplinary knowledge produced by schools because it offers her the possibility of learning to function in everyday life and of understanding the natural and social environment from a disciplinary, scientific, and/or academic perspective. These statements express the social and personal importance that individuals attach to knowledge, in that what is learned in school is the basis for interaction in social life, such as knowing how to write, add, and read. This is how one student describes it when referring to the subject she likes best

Thanks to Language Arts, I know how to write well. I see kids my age who do not go to school, and they write “hermosa”

without an H. Besides, the teachers teach you well, and you leave knowing what you learned. It is not like they make you write something, then you forget it, and do nothing. I feel that is the most important thing. Also, math, because otherwise you won't even know how to add (Personal communication, female student, 15 years old, EES C, 3rd year, April 6, 2023)..

In this sense, we find knowledge and learning that shape and enhance the way of “being” a citizen in relation to doing. “Knowing how to do” is part of a double movement in neoliberal societies. The first refers to the fact that discourses and logics about freedom, flexibility, and autonomy drive individuals to “make themselves” (Langer, 2013), to take charge of their personal fulfillment and their material conditions of existence, for which it is necessary to learn and “know how to do everything” at the same time. The second movement points out that not everyone has the socioeconomic, cultural, and material conditions to exercise this power to “do everything.”

This dynamic leads to exclusion, leaving individuals *with nothing to do*. As the student says, they teach well at school, “you leave knowing how to write and add. If this is not the case, if you do not learn or forget what you have learned, the possibility of being left with nothing to do increases, not only at school but also in society. This movement of inclusion and exclusion, to which we have referred, is becoming increasingly intense in neoliberal societies (Brown, 2021)

Faced with the risk of “ending up on the street or bankrupt,” “doing nothing” due to the difficulties young people currently encounter in entering the labor market, they are committed to school and see learning as a way to resist situations of inequality and urban poverty (Langer & Esses, 2019). Thus, learning, teaching, and knowledge shape how individuals become citizens, as they support thinking about the future in instrumental, practical terms of personal and social fulfillment. This is how a student starting high school expresses it:

School builds citizenship by educating more people so that they know. In other words, it helps you know what you have to do when you grow up. It basically helps people who don't know what to do. At school, you learn. That is, you learn things that will be useful in the future, such as building citizenship and

knowing what you will do or what you will be able to do. It educates you. It educates you so that the country can improve (Personal communication, male student, 12 years old, EES B, 1st year, April 5, 2023)

The student places “building citizenship and educating” on the same level; from his perspective, they are two processes that develop simultaneously, so that individuals know what they can and must do in society. In this sense, what is learned in school about what to do does not come from the accumulation of information, but rather encompasses a set of knowledge, techniques, logics, and rationalities that modulate the practices, ways of being, thinking, and acting (Foucault, 2018) of individuals. In a society marked by the logic of competitiveness, which constantly calls on individuals to “know how to do everything,” they are also called upon to take the risk of “doing nothing.” This does not prevent students from thinking of school as an opportunity to integrate into a society that is advancing rapidly through socioeconomic, political, cultural, and technological change, while at the same time excluding and leaving out vast populations. From this perspective, students think of school as an institution that educates them to “keep up with society,” as we will describe below

3.3. Knowing how to keep up with society

As we have been arguing, citizenship is produced within a framework of dynamics of inclusion and exclusion that each society negotiates as best it can (Adamovsky, 2023; Farinetti et al., 2023). In this process, the principle of equality (Rosanvallon, 2012) is strained by situations of precariousness (Butler, 2010) and urban inequality (Di Virgilio & Perelman, 2019; Segura, 2020). In this context, school occupies an important place in students' lives because, from their perspective, it is the institution that integrates people from different neighborhoods into a society that tends toward discrimination. School is the place where the conditions and knowledge are developed for young people to chart “career horizons” (Guzmán et al., 2022) that are important for them to “enter and integrate” into society. As one student explains

School is important to me because it shapes you as a person and gives you the tools to integrate into society in a certain way [...], so that you can later become part of society. School is fundamental for that, because with a good education, you are more likely to integrate better and keep up with this society that is advancing very quickly (Personal communication, male student, 17 years old, EES C, 6th year, April 28, 2022).

As we know, school is not the only place where young people socialize and learn; this also happens within the family and on the street, but it is the institution to which students attach the most significant importance in terms of “forming themselves as individuals” and developing skills such as “not keeping quiet, knowing how to express themselves, and being informed,” which allow them to be more socially integrated.

School, as I say, education, gives you the tools so that you are not walked over, so that you know how to express yourself. So that you then have arguments for what you want to do, whether it is to look for a job or simply to be part of society. I think that is how it is, the education you get at school is also about knowing how to express yourself (Personal communication, male student, 17 years old, EES C, 6th year, April 28, 2022). that is advancing very quickly (Personal communication, male student, 17 years old, EES C, 6th year, April 28, 2022).

For the student, education is important in his life because it allows him to acquire knowledge to function in society and everyday life. From their perspective, “knowing how to express yourself, not keeping quiet, and having arguments” are key tactics that help you “not get walked over” in a society that tends toward exclusion. These practices and knowledge shape subjectivities

and ways of being a citizen in and from school. This process of subjectivation and/or citizenship involves changes in ways of thinking, speaking, and acting, as the student affirms in his own words: “I came with one mindset and I am leaving this school with another” (Personal communication, male student, 17 years old, EES C, 6th year, April 28, 2022). The preparation of young people in school involves what happens inside and outside educational institutions.

School prepares you to keep up with what is happening and to be more informed, so that you know and will know in the future how to react to situations that will arise in a certain way, through the subjects that schools teach you, such as mathematics and citizenship. We also learn a lot about current events in this country, obviously. (Personal communication, male student, 17 years old, EES C, 6th year, April 28, 2022).

The subjects, in this case secondary school students, become citizens in the process of going to school, questioning themselves, going out and projecting themselves with “another mentality” that allows them to adapt to “the rhythm of society,” express themselves, not remain silent, and connect with the world of work (Corica et al., 2022; Guzmán et al., 2022), continue with further studies (Otero et al., 2021) or, in the words of the student, “simply be in society.” In this way, school is thought of and experienced by young people as a place of learning that becomes a knowledge base for “keeping up with the things that happen” in society.

4. Conclusions

The description of school knowledge for citizenship allowed us to examine the place education occupies in students’ lives, insofar as what they learn in school is seen by them as a basis for becoming citizens today in a society that tends toward exclusion and the denial of rights. The results reveal at least three figures and/or ways of being a knowledgeable citizen. We refer

to the citizen who knows how to be someone else in life, “knows what to do,” and “knows how to keep up” with the pace of society.

In neoliberal societies that call on individuals to take on the risk of becoming nothing, in short, of being a non-citizen, young people think about the possibility of being citizens who know how

to be someone else in life. There, the desire to be someone else, with work, education, rights, and knowledge, in order not only to live but to live well and better, gains strength, which is enhanced through study in and from school.

From the students' perspective, the figure of a knowledgeable citizen who "knows what to do" to remain stable in the city and support themselves economically in a context marked by uncertainty, instability, and exclusion caused by rapid social, political, and economic changes takes on importance.

Likewise, the statements of students in their final year of secondary school express the figure of the citizen who knows how to keep up with society in order to enter and integrate into it. In this process of social integration, schools play an important

role in students' lives because it is there that they learn to express themselves, not remain silent, and to develop arguments to defend their rights and function in a society marked by extreme poverty, inequality, and social exclusion.

Today, being a student, a young person, a citizen, and even a worker involves what happens inside and outside educational institutions, in neighborhood settings, and in the lessons learned at school. Ultimately, school knowledge—knowing how to be, knowing how to do, and knowing how to keep up with society—empowers citizens as they navigate schooling in a society that tends toward exclusion. In this sense, education occupies an important place in the lives of young people because it allows them to build the conditions and opportunities to integrate and sustain themselves in today's society.

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Optimization of gas and nutrient concentrations in the photobioreactor system

Optimización de la concentración de gases y nutrientes

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Optimization of gas and nutrient concentrations in the photobioreactor system

Optimización de la concentración de gases y nutrientes

Abstract

Research with microalgae offers technological solutions for capturing greenhouse gases, transforming CO₂ from industrial emissions into microalgal biomass of commercial value, such as agricultural biostimulants. This process simultaneously combines environmental benefits, through the reduction of emissions, with the production of bioproducts of industrial interest. To optimize their growth in photobioreactors, it is key to determine the nutrients and the optimal concentration of CO₂. In pilot tests, a dose of 100 ppm nitrogen maximized yield (2.95 g m⁻² d⁻¹ in harvest 5). In addition, three CO₂ concentrations (500, 1000, and 1500 ppm) were evaluated, supplied by diesel-generated combustion gases, with no significant differences in biomass production. The microalga *Scenedesmus*, enriched with Nitrofoska (1 ml L⁻¹), showed that high CO₂ concentrations do not affect its yield. Thus, the captured gases are converted into microalgal biomass, useful as a biostimulant, demonstrating a sustainable solution for industrial emissions.

Keywords: Combustion gases, gas capture, *Scenedesmus* sp., nutrients, microalgae.

Resumen

La investigación con microalgas ofrece soluciones tecnológicas para capturar gases de efecto invernadero, transformando el CO₂ de emisiones industriales en biomasa microalgal de valor comercial, como bioestimulantes agrícolas. Este proceso combina simultáneamente beneficios ambientales, mediante la reducción de emisiones, con la producción de bioproductos de interés industrial. Para optimizar su crecimiento en fotobiorreactores, es clave determinar los nutrientes y la concentración óptima de CO₂. En pruebas piloto, una dosis de 100 ppm de nitrógeno maximizó el rendimiento (2,95 g m⁻² d⁻¹ en la cosecha 5). Además, se evaluaron tres concentraciones de CO₂ (500, 1000 y 1500 ppm), suministradas mediante gases de combustión generados por diésel, sin diferencias significativas en la producción de biomasa. La microalga *Scenedesmus*, enriquecida con Nitrofoska (1 ml L⁻¹), mostró que altas concentraciones de CO₂ no afectan su rendimiento. Así, los gases capturados se convierten en biomasa microalgal, útil como bioestimulante, demostrando una solución sostenible para emisiones industriales.

Palabras clave: Gases de combustión, captura de gases, *Scenedesmus* sp, nutrientes, microalgas.

1. Introduction

Microalgae are considered among the first living organisms to appear on Earth and were responsible for absorbing atmospheric CO₂ and transforming it into glucose and oxygen. They can produce carbohydrates, lipids, proteins, pigments, vitamins, and other value-added chemicals. These organisms exhibit rapid growth rates and high lipid productivity (Lu et al., 2020).

Microalgae are currently an option for the production of biomass with multiple uses, including animal feed supplements, biofuel production, and the separation of components for both human consumption and specific industrial uses. For example, microalgae lipids can be used as raw material for biodiesel production, carbohydrates as a carbon source in the fermentation industry, long-chain fatty acids as healthy food supplements, and proteins and pigments for treating diseases (Chew et al., 2017).

The key to microalgal biomass production lies in optimizing growth conditions (Blair et al., 2014). Among the key control parameters in development are lighting, pH, and temperature (Chegukrishnamurthi et al., 2020), as well as nutrients, either from agricultural use or from animal by-products. Microalgae cultivation in laboratories has developed significantly in recent decades. Studies have validated the use of laboratory-prepared culture media to increase the production of microalgae species that are costly in Ecuador, such as modified Chu-10 (Sharma et al., 2011). Lee and Zhang (2016) studied several physical and chemical factors that influence microalgal growth, including nitrogen and carbon dioxide levels, light intensity, and temperature.

Although the nitrogen requirements for *Scenedesmus* are well established, it was necessary to determine an efficient reference dose for the specific system used. In addition, the efficient and economical supply of carbon is considered a key bottleneck to industrial

scalability. The capture of combustion gases and their subsequent injection into microalgae cultures is established as one of the most promising technologies for low-energy-cost carbon capture (Young et al., 2019). However, the complex composition of these gases, which may contain compounds other than CO₂, poses a challenge for developing microalgal strains.

If the nutritional needs of microalgae are known, we can replace these commercial media with others that are more economical and environmentally friendly. Studies with wastewater allow the use of nutrient media that could otherwise contaminate other effluents. Microalgae species such as *Scenedesmus* and *Chlorella* have adapted to extremely harsh conditions, including tannery wastewater (Nagi et al., 2020).

Despite consensus on the importance of nitrogen, there are gaps in knowledge about the optimal dose for biofilm or photobioreactor sheet cultivation systems, where nutrient dynamics differ significantly from those in suspended cultures. Most studies focus on maximizing lipid accumulation or wastewater remediation. However, few address optimal nitrogen doses and CO₂ enrichment derived directly from actual combustion gases in an integrated manner under semi-continuous conditions. Understanding this will enable the design of viable industrial-scale systems, where resource efficiency (fertilizers and CO₂) determines the economic and environmental sustainability of the process.

The main objective of this study is to evaluate the technical feasibility of using flue gases as a carbon source for the cultivation of *Scenedesmus* sp. in a sheet photobioreactor system, determining: (1) the effect of different CO₂ concentrations (500–1500 ppm) on productivity and physicochemical parameters of the medium, and (2) a reference nitrogen dose that optimizes biomass production within this integrated emissions capture system.

2. Materials and methods

The tests were carried out at the PUCE Ibarra facilities (Province of Imbabura, Ecuador) in a metal-framed greenhouse with polycarbonate panels. Sixteen laminar photobioreactors were used for microalgae production, with combustion gases circulating inside them. The panels are 1.3 m high by 0.90 m wide and are made of expanded polystyrene with four cavities. High-density polyethylene (Saran) was placed on top of this sheet to support the textile material. A recirculation pump installed in each photobioreactor distributes the nutrient solution throughout the sheet (Optimization of Patent ES2347515A1). Two independent experiments were conducted under greenhouse conditions. Each treatment consisted of four replicates (independent photobioreactor units). The experiments are detailed below.

2.1. Optimization of nutrient doses (Experiment 1)

To optimize nutrient doses in the bioreactor system, the *Scenedesmus* sp. culture was initially propagated on the panels with a single dose of Nitrofoska nutrient (1 ml L⁻¹). Twelve days after sowing, the Nitrofoska nutrient doses required for the test were added in nitrogen concentrations of D1: 100 mgL⁻¹; D2: 200 mgL⁻¹; D3: 300 mgL⁻¹; and D4: 400 mgL⁻¹. The trial was implemented using a randomized block design with four replicates. The only treatment that received extra nutrient solution was D1, to maintain a stable solution at 100 mg L⁻¹ N throughout the trial, as nitrate levels decrease after harvesting. A constant injection of air is maintained in each photobioreactor unit. The trial lasted 70 days with 7 harvests at 7-day intervals. The primary response variable was biomass production (dry matter, g m⁻² d⁻¹).

2.2. Optimization of gas concentrations (Experiment 2)

The independent variable was the concentration of CO₂ in 16 photobioreactor units. The microalgae used was *Scenedesmus* sp., and a Nitrofoska

nutrient solution (1 ml L⁻¹) was used. The CO₂ concentrations tested were C1 = ambient (~400 ppm), C2 = 500 ppm, C3 = 1000 ppm, and C4 = 1500 ppm, using a completely randomized block design distributed in 4 blocks. Combustion gases were fed into the system for 12 consecutive hours (6 a.m. to 6 p.m.) and 12 hours without supply (6 p.m. to 6 a.m.). The temperature during the test phase was maintained at an average of 20.87°C (maximum of 26.50°C and minimum of 16.13°C). The selected CO₂ concentrations (500–1500 ppm) are within the ranges recently studied to optimize carbon capture and assimilation in microalgae, where even higher concentrations are viable without inhibiting growth (Yang et al., 2024).

The secondary response variables for both experiments were: pH, electrical conductivity, nitrate concentration (only for experiment 1), total dissolved solids, salts, absorbance at 750 nm, and water consumption.

2.3. Analytical and c determinations

To measure CO₂ levels in the photobioreactor units, an ALNOR COMPUFLOW 8610 device was used, with a range of 0 to 5000 ppm and a reading resolution of ±3%. Data was collected in each cavity created in the unit (subpanel). To do this, a connector was attached to each flexible hose so that, when the reading was taken, the hose could be separated, the equipment placed in position, and the connector immediately reattached. This process took less than one minute. The concentration of CO₂ in the photobioreactor units was measured daily.

A HORIBA model F-74BW device was used to determine the pH, electrical conductivity, total dissolved solids, and salts in the nutrient solution. A 50 ml sample was taken from the tank containing the nutrient solution through a return hose connected to the photobioreactor unit. Once the variables were measured with the equipment, the sample was returned. The measurement was

performed daily throughout the entire evaluation cycle.

The absorbance (750 nm) in the nutrient solution was determined daily using Thermo Spectronic Model Genesys 20 equipment.

Nitrate levels in the nutrient solution were measured daily using a HORIBA LAQUAtwin B-743 instrument. Measurements of the nitrate content in the culture medium were taken before harvesting the algae and after applying the nutrient solution, to maintain stable concentrations throughout all phases of cultivation (100 ppm N, 1 mL L⁻¹ of Nitrofoska). The measurement of nitrate content was considered an indicator of nutrient application, if required. Six harvests were carried out at 7-day intervals over a total period of 60 days.

Water consumption was measured daily in each photobioreactor unit by gauging the nutrient solution tank at the beginning of the day and adding water to the gauge line at the end of the afternoon. Water consumption was measured during daylight hours (6 a.m. to 6 p.m.) and nighttime hours (6:05 p.m. to 6 a.m.).

The CO₂ supply to the photobioreactor units was adjusted to comply with the concentrations established in the test (C2: 527±15, C3: 1001±32, and C4: 1504±26 ppm), thus falling within the established ranges for the treatments to be analyzed (C2: 500 ppm, C3: 1000 ppm, and C4: 1500 ppm). The treatment that does not inject combustion gases (C1) has a CO₂ concentration of 406±27 ppm in previous measurements. However, outside the greenhouse (in the

environment), CO₂ is 349±14 ppm. This increase is due to the slight gas concentration created inside the greenhouse.

The microalgae were collected from the textile sheet by scraping before suspending the nutrient solution supply, and the nutrient solution supply cycle was immediately resumed. A 40 ml sample of the harvest was centrifuged to reduce the water content of the medium, then dehydrated at 40°C until a constant weight was reached. Seven continuous harvests were carried out to test nutrient concentrations, and six harvests were evaluated for combustion gas concentrations. A 15-day interval was established after sowing the microalgae to maintain stable growth in the photobioreactor, and subsequent collections were made every 7 days.

2.4. Statistical analysis

Data analysis was performed using R statistical software (version 4.3.1). The data from each experiment were analyzed separately. For all response variables (biomass production, pH, electrical conductivity, nitrates, etc.), the assumptions of normality and homoscedasticity (homogeneity of variances) were verified prior to analysis.

Given that measurements between successive harvests are not entirely independent, a conservative approach was taken by analyzing each harvest separately. For each harvest, a one-way analysis of variance (ANOVA) was performed, and if significant differences were detected ($p < 0.05$), a multiple-comparison of means was conducted using Tukey's test.

3. Results

3.1. Experiment 1: Optimization of nitrogen dosage

This section shows the effect of applying four nutrient doses on different parameters. As can be seen (Figure 1), the treatments, in which different nutrient doses were applied, did not affect the CO₂

concentration, revealing that a higher nutrient dose does not lead to higher CO₂ consumption. The average obtained throughout the trial for each nutrient dose was D1: 358.9±12.58 ppm; D2: 358.8±12.61 ppm; D3: 359.04±12.77 ppm; and D4: 359.04±12.78 ppm of CO₂.

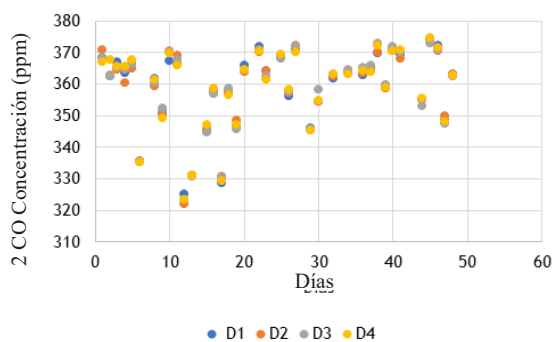


Figure 1. Average CO₂ concentration of the four subpanels of the photobioreactor unit (D1: 100 mgL⁻¹; D2: 200 mgL⁻¹; D3: 300 mgL⁻¹; D4: 400 mgL⁻¹ of N). Source: Own elaboration (2025).
Source: Own elaboration (2025).

Nitrate concentration

Figure 2 shows the evolution of the nitrate content in the nutrient solution for the four nutrient treatments applied. In dose D1, nutrient application to the culture medium maintains a stable concentration of around 100 ppm N. On the other hand, in treatments D2, D3, and D4, a progressive decrease in nitrate content can be observed, suggesting initial saturation and subsequent active consumption.

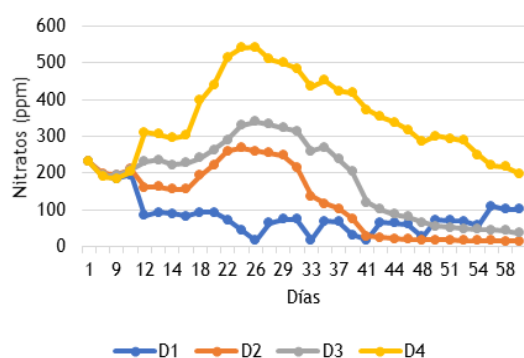


Figure 2. Evolución temporal de la concentración de nitratos para las diferentes dosis de nitrógeno (D1: 100 ppm; D2: 200 ppm; D3: 300 ppm; D4: 400 ppm de N).
Source: Own elaboration (2025).

Electrical conductivity

Electrical conductivity (EC) in crops remains differentiated across treatments due to differences in nutrient concentrations (Table 1). Over time, EC gradually decreases for doses D2, D3, and D4, but not for D1, where EC increases. It can therefore be observed that, initially, EC shows a direct, positive relationship with the applied nutrient dose. Treatment D1 receives Nitrofoska in order to maintain a concentration of 100 mgL⁻¹ of N (Table 1). In general, dose D4 has a significantly higher EC than D2 and D3.

Microalgae production

In relation to dry matter production, it can be seen (Table 2) that the highest values in all harvests are found in the 100 mgL⁻¹ N treatment (D1), with the highest production (2.95 gm⁻² d⁻¹) in harvest 5. In the harvests of weeks 1 and 2, there are no significant differences between the doses used. However, dose D1 in harvests 3, 4, and 5 shows significantly higher production than the other treatments. The best production and the lower cost associated with the lowest dose lead us to conclude that this is the ideal treatment. Thus, the yield during the seven harvests evaluated was higher for dose 1, while the other doses showed lower yields. The maximum yield was for dose D1 in week 5 of the harvest.

Although doses D2, D3, and D4 have higher nutrient concentrations than D1, this does not benefit dry matter production; yields are statistically equal across these treatments, with a gradual decrease in subsequent harvests. Our results show that the lowest applied dose yields higher production, so it should be used to optimize production costs.

Table 1. Electrical conductivity ($\mu\text{S cm}^{-1}$) per weekly harvest. For each harvest, treatments with the same letter do not show significant differences (Tukey $p < 0.05$).
Source: Own elaboration (2025).

DOse	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Harvest 7
D1	516.10d	395.09c	503.14c	628.76b	787.25ab	874.00a	1083.12a
D2	950.02c	824.43b	637.14bc	518.46b	574.29b	556.01b	663.07c
D3	1353.51b	1161.55b	931.57b	727.50b	695.13ab	639.14b	713.07bc
D4	1774.28a	1636.88a	1350.53a	1163.72a	997.15a	819.54a	773.43b

Table 2. Dry matter production (g m⁻² d⁻¹) of *Senedesmus* sp in response to different nitrogen doses (D1: 100 ppm, D2: 200 ppm, D3: 300 ppm, D4: 400 ppm of N) over seven harvests. Within each harvest, values with different letters are significantly different (Tukey's test, $p < 0.05$).
Source: Own elaboration (2025).

Dose	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Harvest 7
D1	1.37 ^a	1.84 ^a	2.17 ^a	2.67 ^a	2.95 ^a	2.28 ^a	1.64 ^a
D2	1.22 ^a	1.35 ^a	1.12 ^b	1.50 ^{ab}	1.21 ^b	1.21 ^{ab}	0.94 ^a
D3	1.11 ^a	1.07 ^a	1.00 ^b	0.95 ^b	0.90 ^b	1.21 ^{ab}	1.13 ^a
D4	1.32 ^a	1.28 ^a	0.97 ^b	0.87 ^b	0.89 ^b	0.85 ^b	0.95 ^a

D1: 100 ppm; D2: 200 ppm; D3: 300 ppm; D4: 400 ppm de N

The average of the seven harvests carried out shows highly significant differences ($p < 0.01$) for the doses. The Tukey test (0.05) establishes that the average treatment with the highest yield is D1, which is significantly different from D2, D3, and D4. Source: Own elaboration.

3.2. Experiment 2: Optimization of CO₂ concentration

This section studies the effect of treatments with different CO₂ concentrations on the parameters analyzed.

pH

The pH values across the different treatments range from 8.1 to 8.4 during the growth phase. However, in the later phases, this range is much wider, fluctuating wildly from one measurement day to the next. In relation to the effect of the treatments, we found that, in general, the 1000 ppmCO₂ treatment showed the lowest pH values compared to the control treatment and the 1500 ppm treatment in phases 3, 4, 5, and 6, with the 500 ppm treatment usually showing higher pH levels compared to the 1000 ppm CO₂ treatment(2) treatment

Electrical conductivity and total dissolved solids

Electrical conductivity and total solids concentration in the nutrient solution showed similar behavior across all treatments in terms of overall temporal trends and post-harvest responses. These two parameters show an

apparent increase as the different harvests progress, starting with EC values close to 500 $\mu\text{S cm}^{-1}$ and ending with values of almost 800 $\mu\text{S cm}^{-1}$ or higher than 1,000 depending on whether we measure before or after the last harvest, respectively, which is indicative of a direct relationship between nutrient concentration and electrical conductivity, as described above. After harvesting, a nutrient solution is added, which increases electrical conductivity. This parameter decreases over time because microalgae absorb nutrients from the environment as they develop. No significant differences were observed between EC treatments.

The treatments significantly affected electrical conductivity and total dissolved solids concentration during the first, second, and third harvests, with the 1000 ppm CO₂ treatment (C3) showing significantly higher values than the others. However, in phase 6, the 500 ppm CO₂ treatment (C2) had a significantly higher EC than the ambient CO₂ treatment (C1).

Salts

Salt levels generally follow a pattern similar to that of electrical conductivity and total dissolved solids, with increases from the beginning to the end of the trial and between harvests. The response of salt levels in phases 1, 2, and 6 was also similar to the variables mentioned above. However, unlike with electrical conductivity and total dissolved solids, we found significant differences between treatments in harvests or in phases 4 and 5

Absorbance

This parameter was used to monitor the presence of algae in the nutrient solution. During the growth phase, absorbance increased gradually over time. Although the coefficient of variation is high, this may be because the absorbance measurements are, in most cases, less than 0.03, and any minimal variation has a drastic effect on their variability.

Water consumption

Water consumption is related to greenhouse temperature, resulting in fluctuations both during the day and at night, with slightly more minor variations at night between treatments (Table 3). Table 3 shows the total water consumption both during the day and at night in the treatments applied. No significant differences were observed between the treatments during the day and at night. Thus, it can be said that the variation in the concentration of combustion gases does not affect the water consumption of the recirculation system.

Table 3. Average water consumption during the trial (L h⁻¹m⁻²) between treatments .
Source: Own elaboration (2025).

During the day	C1	C2	C3	C4
Average	0.106	0.093	0.093	0.094
At night	C1	C2	C3	C4
Average	0.129	0.124	0.125	0.121

C1= ambiente, C2= 500 ppm CO₂, C3= 1000 ppm CO₂, C4= 1500 ppm CO₂

Production

Table 4 shows the dry matter production results (g m⁻² d⁻¹) for the harvested volume in each treatment. The ANOVA results show no significant differences in dry matter content between the different CO₂ doses applied for each harvest.

The dry matter production in all harvests did not show significant differences between treatments (Tukey, p<0.05), which highlights that the increase in CO₂ concentration neither improves nor worsens the production in the harvests carried out during the experiment.

In harvests 3, 4, and 5, production increased. This is because the photobioreactor unit's sheet forms a compact microalgal film, achieving maximum production. In harvest 5, in particular, the concentrations C1, C2, and C3 are higher than in the other harvests. In the sixth harvest, there is a decrease in dry matter yield. This may be due to the nutrient solution's high electrical conductivity (above 1000 µS cm⁻¹), which can reduce *Scenedesmus* sp. growth. The results obtained are confirmed by Huang et al. (2016) in trials on the influence of CO₂ on the cell growth of *Chlorella* in a biofilm, observing that an increase in CO₂ in the culture chamber does not necessarily correspond to an increase in the growth rate of this species. On the other hand, in tests carried out by Zhao et al (2015), the biomass of *Chlorella* was inversely proportional to the increase in CO₂ concentration.

Table 4. Dry matter production in g m⁻²d⁻¹ . For each harvest, treatments without letters indicate that there are no significant differences (Tukey, p<0.05).
Source: Own elaboration (2025).

CO ₂ concentration	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Harvest 7
C1	2.64	3.64	3.71	4.33	4.44	2.94	1.64 ^a
C2	2.42	2.79	4.25	4.33	4.77	2.91	0.94 ^a
C3	2.29	2.66	4.08	4.72	4.92	3.12	1.13 ^a
C4	2.24	3.43	3.90	4.89	4.69	3.10	0.95 ^a

C1= ambient, C2= 500 ppm CO₂, C3= 1000 ppm CO₂, C4= 1500 ppm CO₂

pH in the harvests

Table 5 shows that there are highly significant differences ($p < 0.01$) in pH in all harvests except harvest 3, where the differences are significant at 0.1%.

The pH behavior in the first three harvests remains slightly stable, after which there is an increase in its value, decreasing in the last harvest. This decrease coincides with that recorded in dry matter.

Table 5. Variation in pH by harvest and CO₂ concentration. For each harvest, if the treatments have the same letter, they do not present significant differences (Tukey $p < 0.05$).
Source: Own elaboration (2025).

CO ₂ concentration	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Harvest 7
C1	7.70 ^{ab}	7.85 ^a	7.69 ^a	7.88 ^a	7.93 ^{ab}	7.80 ^b	1.64 ^a
C2	7.77 ^a	7.74 ^a	7.64 ^{ab}	7.90 ^a	8.04 ^a	7.92 ^a	0.94 ^a
C3	7.65 ^b	7.75 ^a	7.66 ^{ab}	7.70 ^b	7.82 ^b	7.78 ^b	1.13 ^a
C4	7.66 ^b	7.60 ^b	7.60 ^b	7.81 ^{ab}	7.97 ^a	7.77 ^b	0.95 ^a

C1= ambiente, C2= 500 ppm CO₂, C3= 1000 ppm CO₂, C4= 1500 ppm CO₂

4. Discussion

The results of this study provide valuable information for optimizing nutrient and CO₂ concentrations in the cultivation of *Scenedesmus* sp. in photobioreactor systems. The findings highlight the complex interactions among nutrient dosing, CO₂ enrichment, and biomass production, with significant implications for large-scale microalgae cultivation.

4.1. Nutrient concentration and biomass production

The study showed that the lowest nitrogen dose (D1: 100 mg L⁻¹) produced the highest amount of biomass, significantly outperforming the higher doses (D2-D4). This observation is consistent with previous research indicating that excessive nutrient concentrations can inhibit microalgal growth (Kumar & Bera, 2020). The gradual decrease in nitrate levels in treatments D2-D4 suggests that higher nitrogen doses may not be efficiently utilized by *Scenedesmus*, possibly due to nutrient saturation or osmotic stress caused by increased electrical conductivity (EC). The direct correlation between EC and nutrient concentration supports this idea, as the highest EC values were recorded in D4, coinciding with the lowest biomass yields. These results emphasize

the importance of balancing nutrient availability to avoid suboptimal growth conditions.

4.2. CO₂ enrichment and system performance

Contrary to expectations, CO₂ enrichment (500–1500 ppm) did not significantly improve biomass production. This finding contrasts with studies reporting increased growth rates of *Scenedesmus* under elevated CO₂ conditions (Shayesteh et al., 2021). However, the stability in biomass production across all CO₂ treatments suggests that *Scenedesmus* may exhibit broad tolerance to varying CO₂ concentrations, as noted by Huang et al. (2016). These findings are consistent with recent studies using flue gases in photobioreactors, where elevated CO₂ concentrations (1000–1500 ppm) do not always increase biomass but ensure efficient carbon capture (Nad' et al., 2023). The reduction in pH observed at higher CO₂ levels (1000–1500 ppm) did not negatively affect growth, indicating that microalgae can adapt to moderate acidification of the culture medium. This adaptability is advantageous for industrial applications in which flue gas (with varying CO₂ levels) is used as a carbon source.

4.3. Physicochemical parameters

The stability in electrical conductivity, total dissolved solids, and water consumption across all CO₂ treatments highlights the robustness of the photobioreactor system. The absence of significant differences in these parameters suggests that CO₂ enrichment does not alter the physicochemical balance of the culture medium. However, post-harvest pH fluctuations highlight the need for continuous monitoring to maintain optimal growth conditions, especially in large-scale systems where pH stability is crucial for consistent productivity.

4.4. Industrial implications

The improved performance of the low-nitrogen concentration treatment (D1) provides direct economic and environmental benefits, as it reduces both fertilizer costs and the risk of nutrient runoff. In addition, the system's ability to operate efficiently with CO₂ derived from combustion gases aligns with sustainable practices, offering a double benefit: carbon capture and biomass

production (Young et al., 2019). These results support the viability of using *Scenedesmus* for biofertilizer production, contributing to more sustainable agriculture by reducing dependence on synthetic fertilizers (Osorio, J. et al., 2023).

4.5. Limitations and future research

While this study lays the foundation for optimizing *Scenedesmus* cultivation, further research is needed to examine the long-term effects of CO₂ enrichment on microalgae metabolism and lipid/protein content. In addition to integrating wastewater as a nutrient source to improve the sustainability and scalability of the system, photobioreactors are operated under different environmental conditions. Although the study was conducted under controlled conditions, it is important to consider the real-world environment of an industry where temperature fluctuations, variability in combustion gases, and the development of other microalgal species can affect the reproducibility of results on a larger scale.

5. Conclusions

Single-cell algae are currently being used for a myriad of applications, and their production is increasingly moving from pilot trials to industrial-scale optimization due to the growing demand for microalgae-derived products, especially for their functional components.

The production of *Scenedesmus* in a photobioreactor system was higher at the lowest Nitrofoska dose (100 mg L⁻¹ of N) than at the higher concentration treatments (200, 300, and 400 mg L⁻¹ of N), which may be related to the increase in nutrient solution electrical conductivity. Electrical conductivity and water consumption did not differ between treatments with different CO₂ doses.

The highest CO₂ concentrations (1000 and 1500 ppm) decreased the pH of the nutrient solution, without affecting *Scenedesmus* production between treatments. The system implemented allowed combustion gases to be captured at a maximum CO₂ concentration of 1500 ppm without decreasing biomass production.

The *Scenedesmus* biomass production optimized in this study, using low nitrogen doses (100 mg L⁻¹) and enriched with diesel combustion gases at up to 1500 ppm CO₂, lays the foundation for producing a sustainable, low-cost raw material. Future research should characterize the biochemical profile of this biomass (e.g., phytohormone, amino acid, and polysaccharide

content) and conduct agronomic trials to validate its efficacy and potential commercial application as a biostimulant.

This study demonstrates that low nitrogen doses and moderate CO₂ enrichment are optimal for *Scenedesmus* biomass production. These findings contribute to the development of cost-effective and

environmentally friendly microalgae cultivation systems for industrial applications. Future studies could explore integrating complementary technologies, such as microbial fuel cells (Sharma et al., 2023), to couple CO₂ capture with energy generation, thereby optimizing the economic and environmental sustainability of the system.

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Mental health in pregnant Ecuadorian indigenous women during the COVID-19 pandemic. Contributions from critical feminism

Salud mental en mujeres indígenas gestantes ecuatorianas durante la pandemia de COVID-19. Aportes desde el feminismo crítico

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Abstract

The study aimed to analyze the experiences of pregnancy and childbirth in indigenous women during the lockdown caused by the COVID-19 pandemic. The participants were seven women from the community of San Francisco de Huaracay. Data collection involved focus groups and participatory interviews, framed within larger community intervention action research carried out during the first half of 2024. The narratives were subsequently analyzed through content analysis and made it possible to identify and interpret: a) negative experiences encountered by women in their interactions with health services, characterized as obstetric violence; b) emotional responses due confinement and family separation during obstetric procedures; and c) a subjective sense of well-being in some women, connected to family support and cultural practices. It is argued that the determinants of mental health are intersectional and underpinned by processes of inequity, which are exacerbated in extreme situations.

Keywords: indigenous women, motherhood, mental health, COVID-19, critical feminism.

Resumen

El estudio tuvo como objetivo analizar las experiencias vividas por mujeres indígenas ecuatorianas en el embarazo y parto durante la pandemia de COVID-19. Las participantes fueron siete mujeres de la comunidad de San Francisco de Huaracay. La recolección de datos involucró grupos focales y entrevistas, enmarcadas en un trabajo mayor de intervención acción participativa realizado durante el primer semestre de 2024. Los relatos fueron analizados a través del análisis de contenido y permitieron interpretar: a) experiencias negativas en las interacciones de las mujeres con los servicios de salud en pandemia, caracterizadas como violencia obstétrica; b) respuestas emocionales derivadas del confinamiento y la separación familiar durante los procedimientos obstétricos; y c) procesos de bienestar emocional en aquellas mujeres que conectaron con el apoyo familiar y prácticas culturales. Se discuten los determinantes interseccionales y de inequidad de la salud mental en mujeres indígenas, que se ven exacerbados en situaciones límite.

Palabras clave: mujer indígena, maternidad, salud mental, COVID-19, feminismo crítico.

1. Introduction

Critical feminism is a reflective practice grounded in dialogue and in questioning the oppressive environment in which women live. Through this approach, women can express their stories from within their culture, valuing the diverse experiences, subjectivities, and power dynamics that are essential in the pursuit of social justice and empowerment (English & Irving, 2015; Duran et al., 2019), emphasizing the need to address them from a more inclusive and contextual perspective, which in this research is anchored in awareness of pre-, peri-, and postnatal health. From this perspective, critical feminism promotes the idea that all women can resist the hierarchy that underlies health-illness systems and discourses during pregnancy and childbirth through dialogue and reflection on power, mobilized in a participatory environment (Oetzel et al., 2018). In this sense, the study is based on a transformative process constructed epistemologically on the principles of critical pedagogy (Freire, 1982) and takes into account social determinants and the intersectionality of ethnicity, gender, and social class (Lugones, 2008).

Understanding women's health experiences during the pandemic is crucial, as intersectionality reveals how systems of gender, sexuality, education, ethnicity, and social class interact with broader structures such as health systems and public policies (Fulcher et al., 2023). In low- and middle-income countries such as Ecuador, prenatal depression affects a quarter of women (Gelaye et al., 2016), underscoring inequality in access to mental health resources. However, during the pandemic, mental health problems in pregnant and postpartum women worsened globally, as lockdowns led to isolation (Bremner et al., 2021; Wilson et al., 2022) due to lack of social contact (Milne et al., 2020), and many were denied support during childbirth (Akseer et al., 2020; Hübner et al., 2022; Jolivet et al., 2020; Pérez-Escamilla et al., 2020; United Nations UN 2020; UN Women, 2021), contrary to the recommendations of the World Health

Organization (WHO, 2020a; WHO 2020b).s (ONU 2020; ONU Mujeres 2021), contraviniendo las recomendaciones de la Organización Mundial de la Salud (OMS 2020a; OMS 2020b).

Isolation during the COVID-19 pandemic had significant negative psychological consequences for pregnant women and women in labor, including post-traumatic stress, anxiety, and depression (Basu et al., 2021), as well as emotional distress, lack of control, and uncertainty due to perceived vulnerability during childbirth (Choi et al., 2020) and fear of contagion (Corbett et al., 2020; Liu et al., 2020; Perzow et al., 2021; Taubman-Ben-Ari et al., 2020). This experience was characterized by fear of infection, misinformation, and the perception of a lack of preparedness among healthcare personnel (Gangotena & Zurita, 2023). The intensity of these adverse effects on mental health was associated with geographical factors such as the number of COVID-19 infections (Wu et al., 2020), socioeconomic factors such as reduced food availability (Mappa et al., 2020), intrafamilial factors such as conflicts at home (Moyer et al., 2020), age, educational level, and lower family income (Berthelot et al., 2020), as well as incidents during pregnancy, with higher anxiety reported in both the last (Moyer et al., 2020) and first trimesters (Saccone et al., 2020).

During lockdown, prenatal healthcare was irregular or even interrupted. In most countries, healthcare providers minimized non-essential obstetric visits (Cohen et al., 2020; Davenport et al., 2020) and protocols designed to promote a positive birth experience were interrupted. Health services excluded partners during labor and delivery, separated mothers and babies in the immediate postnatal period, and restricted breastfeeding. These disruptions negatively affected the overall quality of birth care and mothers' emotional processes (Cohen et al., 2020; Gangotena & Zurita, 2023). The World Health Organization (2018) states that positive childbirth involves giving birth to a healthy baby in a safe environment (clinically and psychologically),

with continuous support from a chosen person, where care must be provided by friendly and competent staff, and ensure that the woman feels in control and involved in decisions.

Resilience, defined as the ability to cope with difficult situations (Davis & Narayan, 2020), was a crucial factor for women's mental health and well-being during pregnancy and childbirth in the pandemic. Studies revealed that pregnant women displayed diverse coping styles, using their individual capacities in interaction with their community and cultural contexts (Kaye-Kauderer et al., 2021). A clear association was observed between higher levels of resilience and lower depression and anxiety (Brown & Shenker, 2021; Chen et al., 2022; Lubián et al., 2021), while techniques such as meditation or prayer promoted self-confidence and reduced anxiety (Taubman-Ben-Ari et al., 2022). Social support networks, especially family, were fundamental in building resilience in pregnant women, even surpassing dependence on health professionals (Preis et al., 2020; Brown & Shenker, 2021; Jean-Baptiste et al., 2020; Kaye-Kauderer et al., 2021; Silveiro, 2021). The pandemic also provided an opportunity to develop strength and resilience, teaching women the importance of preparing for adversity and the value of sisterhood (Gangotena & Zurita, 2023).

The COVID-19 pandemic intensified systemic health inequalities among Indigenous populations globally (Pickering et al., 2023; Robertson et al., 2021), making them more vulnerable to serious consequences and exacerbating mental health problems (Mallard et al., 2021). Historically, indigenous populations have faced structural inequalities in access to basic services and poor-quality medical care in community centers (Pickering et al., 2023; UN, 2020). During the pandemic, the drastic reduction in pre-, peri-, and postnatal care for Indigenous women was linked to an increase in maternal and infant mortality (Reinders et al., 2020; Rubio & Rangel, 2023; Stratton et al., 2021), underscoring the specific vulnerability of Indigenous peoples in terms of health.

Furthermore, the lockdown situation contradicted the Andean concept of well-being and worldview,

rooted in intuitive and symbolic logic, which perceives life as a whole and prioritizes the interconnection among human beings, the community, nature, and the cosmos (Rodríguez, 1999). Andean philosophy understands illness as a community event, and healing involves restoring balance with the environment and with oneself (Drexler, 2002); in such a way that the intersection between symbolism and emotion that underlies the culture seeks a deep understanding of being through integration, recognizing the interconnection of all things within a network of relationships. In this sense, health and well-being are achieved in harmony and balance across all dimensions of life, transcending Western dichotomies and embracing a holistic, interconnected view of the world (Balarezo, 2015). This allows us to affirm that physical and mental health are not independent, but are part of the interconnection between the individual, spiritual, and community dimensions. Similarly, ancestral knowledge about pregnancy, childbirth, and the postpartum period among indigenous women is a vital practices passed down from generation to generation, which go beyond physical health to encompass emotional, spiritual, and social well-being (Rodríguez & Duarte, 2020). With this in mind, in Ecuador, for the past few years, the Ministry of Public Health (2021) has sought to protect women from the systemic and cultural inequalities that promote obstetric violence, promoting dignified and humanized treatment based on an intercultural approach.

Maternal and child health in Indigenous American communities depends on ancestral practices of collective care and the transmission of cultural knowledge among women (Acosta & Cleghorn, 2017; Martínez-Forero, 2021). However, hegemonic medical devices discriminate against indigenous practices and generate power effects on the mental, sexual, and reproductive health of indigenous women, forcing them to adapt to the medical model (Baeza, 2013) and, as a result, to gradually lose their traditional health knowledge and practices (Alarcón & Nahuecheo, 2008). In addition to this, there is a persistent disparity with indigenous women receiving less prenatal and hospital care than non-indigenous women (Noreña-Herrera et al., 2015).

Despite the control exercised by the biomedical model over indigenous health practices, there are health strategies in pregnancy and childbirth that combine elements of Western medicine with ancestral knowledge, allowing some communities to resist and survive in their physical and mental health processes (Dias-Scopel et al., 2017), bringing community knowledge into dialogue with scientific contributions.

Based on the above assumptions, the objective of this research was to analyze, ex post facto, the experiences of Ecuadorian indigenous women

during pregnancy and childbirth during the COVID-19 pandemic, in order to understand how power dynamics shaped their opportunities within the public health system and the emotions associated with their experiences. We understand that the accounts obtained were mediated by the processes of reinterpretation of experiences four years after the events; however, we consider it appropriate to explore them as part of understanding the power-health dynamics that persist and affect the individual and community well-being of Ecuadorian indigenous women.

2. Materials and methods

This qualitative study adopted a critical feminist perspective to analyze the pregnancy and childbirth experiences of seven multiparous indigenous women (aged 17 to 35) from Imbabura and Cotopaxi, residing in San Francisco de Huarcay, Ecuador, during the COVID-19 pandemic, as detailed in Table 1. The epistemic-methodological approach allowed us to delve deeper into their narratives, focusing on gestational care practices alongside health services, family, and the community.

The study was conducted between April and May 2024 in San Francisco de Huarcay, a community located within the parish of Chillogallo in southwestern Quito. The community faces conditions of extreme poverty and vulnerability, with an unemployment rate of 38% and 22% informal employment. It comprises 618 families, of which 1,482 members are women. (Brito and Robayo, 2023).

Table 1. Participants
Source: Authors (2025)

Pseudonym e ¹	Age	Age at delivery	Number of children*	Date of birth of child	Origin	Place of birth
Pamela	26	22	2	26/9/2020	Province of Cotopax	Home
Danna	21	17	2	26/4/2020	Province of Cotopaxi	Nueva Aurora Maternity Hospital, Quito
Alondra	36	32	2	18/4/2020	Province of Cotopaxi	Nueva Aurora Maternity Hospital, Quito
Nicole	34	30	2	6/5/2020	Province of Cotopaxi	Nueva Aurora Maternity Hospital, Quito
Melany	39	35	2	20/8/2020	Province of Cotopaxi	House
Gesela	33	29	4	24/12/2020	Province of Cotopaxi	Nueva Aurora Maternity Hospital, Quito
Sahori	29	25	3	20/04/2020	Province of Imbabura	Sn. Luis Otavalo Hospital

Note: *This column shows the number of daughters or sons born during the study period.

¹ A pseudonym was used to protect the safety and confidentiality of the participants

The information was collected through narratives shared in focus groups within a collaborative and intersubjective context. This participatory and active approach was crucial both methodologically and ethically, as it not only contributed to the research objectives but also empowered women in the community by raising awareness of their experiences of pregnancy and childbirth during the pandemic. Three two-and-a-half-hour meetings were held at the San Francisco de Huarca community center, a safe space for group interaction and in-depth discussion of their experiences. The use of a pregnant doll as a pedagogical tool (Allen, 2017; Gangotena, 2019; Gangotena & Zurita, 2023) helped participants reconnect with their experiences, and in the final session, a creative and reflective exercise guided by the facilitators culminated in the collaborative creation of a collage that visually represented their birth stories during the pandemic (Allen, 2017; Arcidiacono et al., 2017; Newing, 2010), facilitating the tangible and collective expression of their narratives to reframe their processes.

Participation was incentivized with financial compensation, healthy snacks, and childcare, and the ethical principles of informed consent and confidentiality were guaranteed.

The validity of the study was ensured through strategies of credibility, confirmability, and transferability (Allen, 2017; Guba & Lincoln, 1994). This included an extensive literature review, audio recordings, detailed transcripts of the narratives, and validation of preliminary findings with the participants. Thematic analysis (Braun & Clarke, 2006) was used to analyze the information, enabling the identification of recurring inductive patterns in the women's narratives. These patterns were categorized and reflexively triangulated by the researchers to generate a hermeneutic system on the meanings of the women's subjective experiences of pregnancy and childbirth during the pandemic. In the results section, these categories are presented alongside verbatim transcripts of the stories.

3. Results

Obstetric violence in times of pandemic

The first thematic category that emerges from the women's narratives has been termed obstetric violence, taking into account the postulates of the World Health Organization (WHO, 2014), which refers to abuse and omissions by health professionals in the care of women during the childbirth process. The participants' accounts refer to widespread violence on the part of the public health services that cared for them during pregnancy and childbirth, aggravated by the health measures implemented due to the pandemic.

A negative childbirth experience in times of emergency

The restrictions imposed in health centers due to COVID-19 contributed to predominantly negative evaluations of prenatal and childbirth experiences. These evaluations reveal feelings of

devaluation, fear, sadness, and a sense of neglect during the most intense moments of childbirth:

"COVID made us cry. I feel like crying when I think about it" (Melany, personal communication, March 20, 2024).

"It is hard to give birth in the hospital because I cried when I did not have to cry; it was tough (Gesela, personal communication, March 20, 2024).

The negative experiences begin with prenatal checkups due to strict social distancing measures that accentuated the neglect of health personnel, which we will explain later. All women agree that there are shortcomings in access to health services for prenatal checkups, with some women even discovering their pregnancy when it was already advanced. Melany reports not having received any prenatal checkups and having to take the necessary steps herself to monitor her pregnancy:

“Since I didn’t have prenatal checkups, I went to get an ultrasound out of my own pocket, but without a doctor’s order. The health center wouldn’t see me” (Melany, personal communication, March 20, 2024).

In general, due to the lack of prenatal care, mothers did not have an accurate count of the week of gestation. In addition, ignorance about the condition of the baby caused distress and, for some, made them doubt the health of the pregnancy:

“My stomach hurt, and I felt sick, but we could not do anything because I did not know I was pregnant. (...) They were no longer accepting patients at health centers or hospitals. Almost a week went by, and I was not making any progress because I did not know how far along I was in my pregnancy. It was a baby, and it was not moving, I could not feel anything” (Gesela, personal communication, March 20, 2024).

Fear of contagion and the limited facilities provided by health services for the transport and care of women in labor led Pamela and Melany to decide to give birth at home, relying on their support networks based on indigenous traditions. However, the experience was not without risks, as there was no mechanism for care during or after delivery. In Melany’s case, her family had to use their own resources to take the newborn to the health center:

“I did not want to go to the hospital to give birth because I was afraid of contagion. I decided to give birth at home, and since my sister is a midwife, she helped me (...) My husband had to take my daughter to the clinic” (Melany, personal communication, March 20, 2024).

Women who decided to go to hospitals reported undergoing invasive procedures. They experienced significant pain due to long wait times for delivery care and feared for their health and that of their babies:

“I was going crazy, as you say, I wanted them to get the baby out, to do whatever it took.” (Nicole, personal communication, March 20, 2024).

Negligence of health personnel

In general, all the women agree that the health personnel treated them discourteously, there were omissions, and in most cases, they were denied care at some point. In this regard, Nicole recounts that after going to the health center and being denied access, she had to walk home and then call an ambulance because she was in labor. Even so, when she returned to the health center, they delayed in treating her:

“When I was about to give birth, there was no car to take me. I went to the Nueva Aurora maternity ward at 4 a.m., taking a friend with me, hidden, because we could not drive the car openly. He left me there and left. I was there until 9 a.m. without being seen (...), and they sent me back. I walked here, and the pain started to get worse and worse. (...) The ambulance came and took me to the Huamani health center. It was already late, around 3 or 4 in the afternoon (...) they did not want to treat me” (Nicole, personal communication, March 20, 2024).

They agree that it was not only a lack of care, but that the health personnel did not believe the reports of pregnant women and women in labor. Alondra points out that she was already in labor, but the staff would not allow her to enter the health facility:

“My pain is worse, before I fall on the floor, I have to go inside... but the baby was already coming out” (Alondra, personal communication, March 20, 2024).

Paradoxically, in order to provide health services, health personnel asked women to confirm their labor symptoms without a prior clinical examination:

“The baby was not moving, I was worried, and I called the health center in Otavalo. They told me they could not send an ambulance unless I had something serious like bleeding” (Sahori, personal communication, March 20, 2024).

In some cases, informal care was provided at the doors of health centers, as pregnant women

were not allowed to enter unless they showed symptoms of labor, according to Gesela.

“First, they attended to me from the outside door, asking if I was healthy or in labor, and then they let me in.” (Gesela, personal communication, March 20, 2024).

The care received during childbirth was also disrespectful. Alondra recalls that once inside the hospital, she was left alone on an assigned stretcher despite being in active labor. She felt compelled to suppress her expressions of pain so that she would be allowed to leave the stretcher and walk:

“I said it did not hurt, and I endured it because they did not give me the necessary care” (Alondra, personal communication, March 20, 2024).

Mental health and support networks in difficult conditions

This category offered a window into the multifaceted nature of maternal health and women’s well-being during their experiences. While a predominant narrative of negativity emerged, often intertwined with feelings of loneliness, isolation, and fear, we also discovered positive dimensions within the subjective experience. These positive elements centered on a sense of identity and a deep connection to their community or group.

Loneliness during pregnancy and childbirth

Women describe their experiences as deeply distressing, involving fear, loneliness, despair, and sadness. Delving deeper into their narratives reveals that, in addition to the physical pain of childbirth exacerbated by the negligence of the healthcare system, women also grapple with intense feelings of loneliness and isolation. This separation from their families and partners occurs both during childbirth and throughout pregnancy, often exacerbated by lockdown measures. Danna’s testimony underscores this reality, highlighting how women were forced to navigate the hospital system alone, without the support of their loved ones.

“Only my mother came with me to the room downstairs where they put the patients. I went into the delivery room alone, my husband was outside the maternity ward with my brother-in-law, and my mother was downstairs” (Danna, personal communication, March 20, 2024).

Sahori recounts that her partner accompanied her to a prenatal checkup due to bleeding. However, the long wait and the policy prohibiting companions left her with no choice but to return home alone.

“So I left there and went home alone” (Sahori, personal communication, March 20, 2024). Other women express that isolation or confinement at home due to lockdown measures caused them to feel profound loneliness, as they were unable to connect with family and friends.

“During the pandemic, I was locked up here in my house. I never went out” (Pamela, personal communication, March 20, 2024).

Alondra explicitly points out that loneliness led her to a pattern of repetitive thoughts and insomnia, suggesting a detrimental impact on her mental health.

“Here, there are only four walls. We went out a little, but I thought a lot, I was very pensive, and I could not sleep until 1 a.m.” (Alondra, personal communication, March 20, 2024).

Family and community as pillars

The family unit plays a vital role in providing care and support at home, complementing the services offered by healthcare professionals. As noted above, many women in our study, due to lockdown measures, relied solely on their partners and had limited interaction with their extended families. Nicole and Pamela vividly recount the profound psychological impact of experiencing loneliness during pregnancy and childbirth:

“I went to the bathroom, and something started coming out. My husband went and brought the doctor, telling her that I was about to give birth and that no one was helping me... I was going crazy” (Nicole, personal communication, March 20, 2024).

“My husband would go to work, only coming home at night and showering and disinfecting everything there (...) I decided to give birth at my mother-in-law’s house. It was hard because I regretted a thousand times not going to the hospital. After all, it was painful, I almost fainted, I almost did not manage to give birth” (Pamela, personal communication, March 20, 2024).

Although the predominant narrative among women is marked by negative experiences, some accounts also highlight the support networks of family, partners, and community as positive protective factors in decision-making regarding obstetric care:

“Later, when the pain was not getting any better, my dad went to get a truck. They took me to the Nueva Aurora maternity ward (...). My dad was the one who took care of me the most while my mom was working” (Danna, personal communication, March 20, 2024)0.

For Sahori, the presence and support of her partner, her in-laws, and her sister-in-law provided her with essential emotional strength during a difficult time:

“They sent me for a pregnancy blood test. I waited outside for two hours, and it came back positive. I started crying because my husband was not working, and my father-in-law said to me in our language, ‘Paniko, do not cry. We will help you get through this no matter what. Do not

cry. You are going to do it. It is a blessing from God’ (Sahori, personal communication, March 20, 2024).

In addition, we found that family support played a vital role in healthcare practices, using ancestral wisdom to nurture and promote well-being throughout pregnancy.

“I told him, something is wrong. I called my dad to give me a home remedy, I took every remedy” (Alondra, personal communication, March 20, 2024).

“My sister is a midwife... she came over to make a home remedy. That helped my baby” (Gesela, personal communication, March 20, 2024).

Indigenous knowledge about childbirth, supported and shared within the family group, empowered some women to choose home birth, thus mitigating the shortcomings of inadequate hospital services:

“I decided to give birth at home, and my sister helped me, my uncle helped too, and that is where I gave birth. My husband had to take my daughter to the Inmaculada clinic so she could be treated there” (Melany, personal communication, March 20, 2024).

“My sister-in-law is a midwife. If she had not come, I do not know what would have happened to the baby” (Pamela, personal communication, March 20, 2024) or to me.

4. Discussion

The narratives of the indigenous women of San Francisco de Huaracay, collected four years after the COVID-19 lockdown, reveal predominantly negative experiences and emotions about pregnancy and childbirth. It is evident that the historical and structural deficiencies of the health system, especially in indigenous communities, were exacerbated during the pandemic, as documented by Reinders et al. (2020) when observing the closure of obstetric care centers. This, coupled with the negligence

and mistreatment inherent in medical services, created an unsafe environment and contributed to women feeling helpless and vulnerable. However, these negative experiences were not only the result of pandemic restrictions, but also of the absence of an intercultural approach and discriminatory dynamics within the healthcare system. Therefore, implementing an intercultural approach to obstetric care (Olaza-Maguiña & De La Cruz-Ramírez, 2024) is crucial to ensure a process that respects the cultural traditions and

principles of physical and mental health of these communities, and is oriented towards maternal well-being.

The women's narratives also reveal that prenatal checkups were irregular and inefficient, involving exhausting trips to distant centers and inadequate care. Denial of access to hospitals until labor was advanced resulted in long, painful waits without assistance, putting maternal and child health at risk. These experiences, which women perceived as undervaluing and disrespectful, are analyzed from the perspective of obstetric violence (WHO, 2014), which includes abuse and neglect. Such violence not only impacts women's physical health but also their mental health, acting as a source of vulnerability, with the potential to contribute to disorders such as post-traumatic stress and postpartum depression (Laínez et al., 2023). Although the study did not delve into these effects, the testimonies indicated an erosion of trust in the health system, which is consistent with the consequences of obstetric violence identified by Annborn and Finnbogadóttir (2022).

The research highlighted the significant challenges to psychological well-being and mental health faced by pregnant and birthing Indigenous women during the pandemic. Their narratives reflected hopelessness, sadness, and isolation, which coincides with the findings of Berthelot et al. (2020). These emotions were exacerbated by home confinement, which limited family and community contact, increasing their susceptibility to depression and anxiety, especially in a population already vulnerable due to socioeconomic, cultural, and educational disparities. On the other hand, strict social distancing measures prevented accompaniment in health centers, separating women from their partners during consultations and childbirth, which intensified feelings of loneliness and helplessness and contravened the recommendations of the World Health Organization (WHO, 2020a; WHO, 2020b) on the importance of family support during the process.

In this regard, from a critical feminist perspective, the study reveals the inherent inequalities and the exercise of power in the field of maternal health

among indigenous women through practices that led to obstetric violence, transforming childbirth into an experience of fear, isolation, and violation of rights. Health care during the pandemic disrupted ancestral cultural practices of pregnancy and childbirth, eroding the community support essential for maternal and child well-being, an effect also observed by Haruna and Nishi (2020) and Nisa-Waller et al. (2024). Although some participants in our study received traditional family care, they also showed dependence on a medical system disconnected from home care. This leads to a gradual loss of traditional knowledge among women, forcing them to adapt to the dominant medical model, which is consistent with the findings of Alarcón and Nahuecheo (2008) and Baeza (2013). The results confirm that it is crucial to integrate ancestral practices of collective care (Martínez-Forero, 2021) into community obstetric care protocols, especially during emergencies.

However, from our understanding rooted in critical feminism, this process also forged remarkable resilience in women and an awareness among participants of their vulnerable situation. Despite negative experiences with the health system, family support and community networks were fundamental to the physical and emotional well-being of women who had this option, offering support based on traditional knowledge and strengthening resilience, as found by Rodríguez and Duarte (2020). Our findings in San Francisco de Huaracay indicate that indigenous women with strong networks experienced greater confidence during pregnancy, opted for home births, or integrated traditional care that provided physical, emotional, and spiritual support, thus reporting more positive experiences than isolated women. This is consistent with the findings of Martínez-Forero (2021) in the Colombian Amazon during the same period.

This underscores the crucial role of social-community support in promoting women's resilience during the pandemic, allowing them to transcend their dependence on poor medical services and value ancestral knowledge, in line with the findings of Brown and Shenker (2021) and Preis et al. (2020), which constitutes a protective factor for these women's mental health

in difficult times. Through this study, women have become aware of the disproportionate negative experiences they have faced, including limited access to healthcare, neglect by staff,

and violations of fundamental rights. These experiences have been reframed in line with the epistemic-methodological premises of critical feminism (Oetzel et al., 2018).

5. Conclusions

The accounts of Ecuadorian indigenous women reveal systemic failures in health policies and in the preparation of health professionals for childbirth during the pandemic, which is intrinsically linked to experiences of well-being and mental health at a crucial moment in maternal and child human development. The confluence of obstetric violence, the insensitivity of health personnel to cultural care networks, and inadequate emergency protocols created conditions that caused psychological harm to women at one of the most vulnerable moments of their lives. The findings of this research demonstrate, on the one hand, that existing approaches to maternal care and emergency preparedness are currently inadequate to care for pregnant and birthing indigenous women; on the other hand, these conditions undermine their mental health. For this reason, it is necessary to insist on intercultural obstetric and childbirth programs that respect the ancestral community practices of indigenous women in network with their families, not only to reduce maternal and infant mortality, but also to guarantee safe spaces for their psychological well-being. The psychological dimensions of

maternal care, including the connection between cultural practices and emotional well-being, must be recognized as essential components of quality care rather than optional adaptations.

Recently, the Ecuadorian Ministry of Health presented the Manual of Good Practices for the Prevention of Gynecological-Obstetric Violence in the maternity wards of the National Health System (Ministry of Health, 2024), which aims to reinforce the right to a companion during childbirth, even during health crises, and to require the integration of culturally appropriate mental health support into prenatal and postnatal care, which is a step forward in the recognition of the obstetric rights of indigenous women. Future research and implementation initiatives should prioritize the voices and experiences of indigenous women as central to the development of solutions, rather than treating them as secondary aspects of program design, thereby ensuring that future emergencies do not replicate the harmful experiences these women endured during the COVID-19 pandemic.

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Carteles de películas de acción indonesias a principios de la década de 1990: Representación de la mujer

Indonesian Action Film Posters in the Early 1990s: Representation of Women

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Carteles de películas de acción indonesias a principios de la década de 1990: Representación de la mujer

Indonesian Action Film Posters in the Early 1990s: Representation of Women

Resumen

El cartel de la película tiene como objetivo explícito promover la película resaltando su contenido. Las películas utilizan carteles para interactuar con el público con el objetivo persuasivo de aumentar el interés en visitar el cine. Los carteles de películas de acción representan la acción realizada por los actores. Este artículo examina la representación de las mujeres en los carteles de películas de acción indonesias de la década de 1990, que se produjeron y estrenaron en Indonesia. Los carteles de películas de acción se estudian y definen descriptivamente. Los datos presentados y obtenidos consisten en palabras y hechos visuales de documentos. La presentación de los datos comienza con el problema inicial que es adecuado para describir el cartel. Los resultados de esta investigación muestran que a principios de la década de 1990, los carteles de películas de acción presentaban la representación de las mujeres no solo como fuertes, empuñando armas e involucradas en peleas, sino que también seguían vendiendo atractivo sexual. Esto se debe a que los hombres veían principalmente películas de acción, por lo que las mujeres eran utilizadas como la atracción principal.

Palabras clave: Indonesia, cartel de película, película de acción, mujer.

Abstract

The film poster aims explicitly to promote the film by highlighting its content. Films use posters to interact with the public with the persuasive aim of increasing interest in visiting the cinema. Action film posters depict the action performed by the actors. This article examines the portrayal of women in Indonesian action film posters from the 1990s, which were produced and released in Indonesia. Action film posters are studied and defined descriptively. The data presented and obtained consist of words and visual facts from documents. The presentation of the data starts from the initial issue that is suitable for describing the poster. The results of this research show that in the early 1990s, action film posters presented the representation of women not only as strong and wielding weapons and involved in fights, but also still selling sex appeal. This is because men mostly watched action films, so women were used as the main attraction.

Keywords: Indonesia, poster film, action film, women.

1. Introducción

Los carteles son un medio promocional relativamente sencillo, compuesto por una sola hoja impresa por una cara en dos dimensiones. Se crean como un medio de comunicación dirigido al público general en espacios abiertos (Sosroyudho, 2010; Tinarbuko, 2009). Se utilizan para presentar información, datos, horarios u ofertas, así como para promocionar un producto o servicio. Los carteles transmiten información o mensajes al público cuando este se desplaza durante un breve periodo de tiempo (Pryshchenko, 2021). Por lo tanto, los diseñadores deben determinar un elemento clave de información. Los carteles que logran captar la atención del público generalmente presentan un elemento dominante y atractivo (Schimkowsky, 2021), mientras que los elementos menos importantes no se destacan, sino que se alinean para formar una impresión armoniosa.

Por su parte, los carteles de cine tienen como objetivo específico promocionar la película. Al igual que los carteles publicitarios, informan sobre el contenido del filme. Todos los elementos contribuyen a transmitir el mensaje para que el público objetivo se interese en verlo (Rustan, 2020). Los diseños de los carteles de cine deben expresar no solo el mensaje general de la película, sino también su impacto emocional. Los espectadores deben percibir que el cartel está estrechamente relacionado con la obra cinematográfica (Linh, 2021). La principal diferencia entre los carteles generales y los carteles de cine es que los primeros suelen tener un público objetivo específico, mientras que los segundos no. Por ello, los carteles de cine enfatizan más la identidad y el género de la película (Fagerholm, 2009). El diseño del cartel se formula según sus funciones, incluida la de servir como medio promocional comercial representativo de una obra. La tecnología utilizada en el diseño gráfico, incluido el cartel, ha pasado por varios periodos de desarrollo: inicialmente como arte puro (bellas artes) a principios del siglo XIX y, posteriormente, evolucionando con la modernización hacia el uso de dispositivos

digitales como computadoras e impresoras (Pryshchenko, 2021). Del mismo modo, las películas utilizan carteles para interactuar con el público con un fin persuasivo, influyendo así en el interés por acudir al cine.

El desarrollo de los carteles de cine también ha seguido el avance de la tecnología del diseño. En Indonesia, durante la edad de oro de la industria cinematográfica en los años setenta y ochenta, los carteles se elaboraban manualmente mediante técnicas pictóricas sobre grandes pancartas. Estos artistas, con su dominio del pincel, producían obras visuales destacadas que se convirtieron en parte integral de la producción filmica. Sin embargo, en la era digital actual —especialmente desde el año 2000— estas obras ya no se encuentran, pues los diseños de carteles se realizan con impresión digital en lugar de técnicas manuales

A finales de los años ochenta y principios de los noventa, las películas de acción experimentaron un notable auge, alcanzando un total de 171 títulos. El drama ocupó el segundo lugar con 167 películas, seguido de la comedia con 74 títulos, 59 dramas adolescentes, 44 películas de terror y tres películas infantiles. Estos datos reflejan un panorama general de cuatro regiones de distribución: Yakarta, Java Occidental, Java Central y Java Oriental. Estas películas de acción no solo resaltaban a actores rudos y carismáticos, sino que también otorgaban un papel importante a mujeres hermosas con estilos sensuales que enfatizaban sus cuerpos en escenas de agresión o intimidad. Es innegable que estas figuras femeninas se convirtieron en un atractivo distintivo del género (Marjono, 1993).

Para atraer al público, los carteles cinematográficos no solo destacan la calidad de la película, sus actores o el misterio de la trama, sino que recurren a información incompleta para generar tensión y despertar curiosidad (Yuan, 2016). En los carteles de películas producidas entre 1966 y 1998, se utilizaban mujeres sexualizadas para

atraer al público masculino, mientras que para las audiencias femeninas se empleaban imágenes de mujeres sensualizadas. Este artículo examina la representación de las mujeres en los carteles de películas de acción indonesias de la década de 1990, producidas y estrenadas en Indonesia.

En la década de 1980, el cine indonesio vivió un periodo de esplendor, caracterizado por una elevada producción cinematográfica. El género de acción fue particularmente relevante, destacándose por valores como el heroísmo, la solidaridad grupal y el coraje para enfrentar la injusticia, como se observa en *Balada Tiga Jagoan* (PT. Lia Indah Swastika Film, 1990). No obstante, a principios de los años noventa, la industria enfrentó importantes desafíos debido al aumento de películas importadas, especialmente de Hong Kong y Hollywood. Esto llevó a los cineastas indonesios a colaborar con actores y directores extranjeros, como en *Bidadari Berambut Emas* (PT. Rapi Film, 1992), que contó con la participación de la estrella internacional Cindy Rothrock. Este fenómeno evidencia un cambio en las estrategias de producción y

comercialización hacia una orientación más global.

Desde la perspectiva del diseño gráfico y la cultura popular, los carteles de cine pueden interpretarse como representaciones visuales que reflejan los valores estéticos, ideológicos y sociales de su época. Las dos películas mencionadas resultan significativas porque aparecieron durante un periodo de transición clave en el cine indonesio, entre el predominio de producciones locales y la creciente influencia del cine de acción internacional.

El objetivo de este estudio es analizar las representaciones visuales presentes en los carteles de *Balada Tiga Jagoan* (1990) y *Bidadari Berambut Emas* (1992), con énfasis en elementos de diseño gráfico como tipografía, color, ilustración y composición. Asimismo, se examina cómo ambos carteles reflejan perspectivas de género en el contexto del cine indonesio de los años ochenta y noventa, con el fin de comprender el papel de los carteles de cine como artefactos culturales que registran la dinámica social, histórica y estética de su época.

2. Materiales y métodos

Este estudio se llevó a cabo utilizando un método no experimental basado en la observación empírica, con el objetivo de recopilar datos y formular una comprensión profunda de los fenómenos estudiados. El objeto de observación fueron las representaciones de mujeres en los carteles de películas de acción producidos a principios de la década de 1990. Las conclusiones del estudio se elaboraron a partir del proceso continuo de recopilación, clasificación, descripción y análisis de los carteles, desde la etapa inicial de recolección de datos hasta la redacción de los resultados finales (Creswell y Creswell, 2018).

Los carteles examinados se describieron y analizaron de manera descriptiva. Los datos obtenidos consistieron en información verbal y elementos visuales procedentes de documentos.

La presentación de los datos se organizó de acuerdo con el problema principal que orienta la descripción de los carteles. Las imágenes se utilizaron como representaciones visuales que apoyan la discusión y facilitan la comprensión de los hallazgos.

La selección de los dos carteles analizados se basó en que ambos representan a dos de las principales figuras femeninas del cine de acción indonesio de la década de 1990: **Sally Marcelina y Cindy Rothrock**. Sally Marcelina es conocida por su valentía y habilidades físicas, características que se reflejan en los roles que interpretó. Aunque también participó en películas de terror y comedias para adultos, en *Balada Tiga Jagoan* (1990) desempeña un papel relevante en la narrativa y participa activamente en escenas de acción.

Por su parte, Cindy Rothrock es una artista marcial reconocida internacionalmente, con habilidades que aportan credibilidad a sus interpretaciones. Su participación en *Bidadari Berambut Emas* (1992) muestra su destreza en escenas de lucha físicas y complejas, representándola como una heroína fuerte y competente. El diseño de investigación se centró en identificar señales relacionadas con la perspectiva de género presentes en los carteles, analizándolas desde la teoría de la mirada masculina propuesta por

Laura Mulvey (1975). Estos signos fueron interpretados mediante el enfoque semiótico de Roland Barthes (1977), con el fin de identificar significados denotativos y connotativos. Posteriormente, se realizó una comparación entre ambos carteles, lo que permitió avanzar hacia el análisis del mito barthesiano (Allen, 2004), entendido como la construcción cultural que articula valores, ideologías y narrativas presentes en las representaciones visuales.

3. Resultados

El primer cartel de película, titulado *Balada Tiga Jagoan* (La balada de los tres héroes, 1990), presenta la historia de tres hombres con grandes habilidades en artes marciales que trabajan como mercenarios. La película, protagonizada por Sally Marcelina, narra el enfrentamiento de tres mujeres hermosas y sensuales, expertas en combate, contra la banda Naga Berlian. Después de que la banda asesina a sus padres y quema su casa, una joven recluta a dos amigas —especialistas en tiro con arco y puntería— para ayudarla a vengarse. Las tres mujeres se muestran unidas, aunque en las escenas de pelea suelen aparecer por separado. Cada una de las heroínas demuestra fortalezas particulares durante el combate. Aunque visten ropa de apariencia masculina, los colores elegidos para sus chaquetas y pantalones —especialmente el rojo vibrante— siguen transmitiendo valentía.

Ambos carteles utilizan tipografía con serif, caracterizada por la presencia de remates en las letras. Para el título se emplea una fuente serif en negrita, mientras que el resto del texto utiliza un peso normal. En el cartel de la izquierda, el foco principal se ubica en ese mismo lado: la atención se dirige al título de la película y a la imagen de dos actores —un hombre y una mujer— situados sobre él. Esta sección destaca porque el título está diseñado en un tamaño grande y un color rojo llamativo. Además, las imágenes de los actores son prominentes, se muestran en gran tamaño y están ubicadas con precisión en el centro del cartel.

En cambio, en el póster de la derecha, el foco principal se encuentra en el lado derecho, donde nuevamente el título —en tamaño grande y



Figura 1: (a) y (b): Cartel de la película «Balada 3 Jagoan»
Fuente: PT. Lia Indah Swastika Film, (1990)

color rojo intenso— y la imagen de dos actores colocados encima de él dirigen la atención del espectador. La foto de ambos actores también destaca por su tamaño y su colorido brillante.

El póster de la izquierda (Figura 1a) presenta un equilibrio simétrico, con una distribución equilibrada de los elementos visuales — fotografías y texto— en ambos lados. En cambio, el póster de la derecha (Figura 1b) muestra un equilibrio asimétrico, donde los elementos visuales están dispuestos sin una estructura equilibrada, siguiendo un diseño de collage más libre.

De acuerdo con la teoría semiótica de Roland Barthes, el cartel *Balada Tiga Jagoan* puede analizarse en tres niveles.

En el nivel denotativo, observamos una descripción literal de los elementos visuales. El cartel (Figura 1a) muestra a tres personajes principales vestidos con ropa de estilo gánster, equipados con armas como pistolas y rifles. El fondo está compuesto por un collage de escenas de la película, incluyendo una carrera de motos todoterreno y una pelea. El título aparece en letras blancas y rojas en negrita.

En el nivel connotativo, interpretamos significados más profundos. Las chaquetas de cuero, las motocicletas y las armas connotan fuerza, rebeldía y violencia. Los personajes no representan héroes convencionales, sino “jagoan”, héroes que actúan fuera de lo habitual. El uso del color rojo en el título intensifica la connotación de peligro y pasión, mientras que la palabra *jagoan* sugiere directamente heroicidad.

A nivel mítico, el cartel reproduce el mito del “héroe rebelde”, muy presente en el cine de acción. Este mito retrata a los héroes como individuos fuertes, independientes y ajenos a sistemas formales, que luchan por lo correcto a su manera. Además, refuerza el mito de la masculinidad dominante al presentar a los personajes masculinos como figuras agresivas y poderosas. En conjunto, el cartel logra construir una narrativa visual que resulta familiar y atractiva para el público, centrada en una lucha épica fuera de los caminos convencionales.

Denotativamente, el póster (Figura 1b) muestra varios elementos clave. En el centro, aparece una escena íntima entre un hombre y una mujer, ambos en estados emocionales intensos. A su alrededor, un collage muestra escenas de lucha, carreras de motocicletas y personajes femeninos con uniformes rojos ajustados, empuñando armas. Los nombres de los actores también están presentes en la parte superior e inferior del cartel —entre ellos Sally Marcelina y W. D. Mochtar—. El título, “BALADA 3 JAGOAN”, aparece en la parte inferior central en un llamativo color rojo.

A nivel connotativo, estos elementos adquieren un significado más profundo. La escena íntima central connota romance y conflicto emocional, lo que indica que la película integra drama romántico además de acción. El personaje femenino con uniforme ajustado y arma connota fuerza, valentía y atractivo, sugiriendo que las mujeres no son meros accesorios, sino figuras relevantes en la narrativa. El color rojo del uniforme y del título enfatiza pasión, emoción y peligro. La combinación de escenas románticas y de acción connota una mezcla de géneros.

A nivel mítico, el cartel construye una narrativa de heroísmo y masculinidad. La figura masculina central puede representar el mito del “héroe vulnerable”, mostrando que incluso un héroe posee una dimensión emocional profunda. Las mujeres fuertes y armadas desafían estereotipos tradicionales, contribuyendo al mito de la heroína como igual del héroe masculino. El uso de la palabra “balada” refuerza la idea de una historia épica o trágica que trasciende la acción física. En conjunto, el póster construye un mito donde la acción se combina con el conflicto emocional para ofrecer un atractivo más complejo al público.

El segundo cartel corresponde a la película *Bidadari Berambut Emas* (Ángel de cabello dorado, 1992), un drama indonesio estrenado en 1993. La historia sigue a María, una joven con cabello dorado natural —un rasgo poco común— y aborda temas de amor, poderes sobrenaturales y crecimiento espiritual. María irradia bondad hacia quienes la rodean mientras busca el sentido de la vida y su propósito.

Ambos carteles utilizan tipos de letra decorativos con serifas y remates afilados. Para el título se emplea una combinación de tipografía romana con serifas y tipografía decorativa en cursiva, con letras que presentan un efecto rayado similar a sangre para añadir énfasis. El resto del texto utiliza tipografía romana con serifas y un grosor notable.

En el póster de la izquierda, el foco principal es la imagen de la protagonista en acción enfrentándose a dos enemigos masculinos, sosteniendo un arma en gran tamaño. En el póster de la derecha, el foco principal es el título, presentado en rojo brillante, acompañado de la imagen de la protagonista dando una patada al enemigo, también mostrada en gran tamaño.

El cartel (Figura 2a) está dominado por la imagen de una mujer (Cindy Rothrock) ejecutando una patada acrobática. Ella viste un chándal negro, mientras que su oponente, un hombre con chaqueta blanca, aparece en posición de defensa. Escenas adicionales rodean la imagen central, incluyendo una escena dramática donde aparecen una mujer vestida de blanco y un hombre, además de otras escenas de acción.

A nivel connotativo, el póster enfatiza la fuerza y las habilidades marciales de la protagonista. La patada alta connota dominio físico, destreza y valentía. El contraste entre la escena de combate

y la escena dramática sugiere una combinación de acción y drama. La reputación de Cindy Rothrock como artista marcial añade una connotación de autenticidad y calidad en las escenas de lucha. El cartel construye el mito de la “heroína”, una figura capaz de igualar —o incluso superar— a los hombres en combate, desafiando estereotipos tradicionales. Además, la referencia al “cabello dorado” en el título refuerza simbólicamente el mito de un poder o atributo excepcional.

El segundo póster (Figura 2b) presenta una composición diferente. En el lado izquierdo aparece un primer plano de un hombre (Billy Drago) sosteniendo un arma con expresión seria. En el lado derecho, un primer plano de Cindy Rothrock también sosteniendo un arma y con una expresión firme. En el centro se muestra una escena intensa en la que la protagonista patea a un hombre, con humo saliendo de un arma cercana. Otras escenas de fondo incluyen carreras y peleas.

A nivel connotativo, este póster enfatiza el conflicto y el peligro. Las expresiones serias y las armas connotan tensión, amenaza y la gravedad de los acontecimientos. El humo del arma y la patada acrobática sugieren una acción rápida y violenta. El cartel proyecta la imagen de un thriller de acción con tiroteos intensos y combates físicos, mostrando un equilibrio entre los personajes masculino y femenino.



Figura 2: (a) y (b) Cartel de la película «Bidadari Berambut Emas»
Fuente: PT. Rapi Film, (1992)

A nivel mítico, el póster refuerza el mito del “heroísmo en el conflicto”: la idea de que los héroes deben enfrentar el peligro de manera directa para alcanzar sus objetivos. La presencia activa de Cindy Rothrock en las escenas de lucha

reafirma el mito de la “heroína”. En conjunto, el cartel construye la imagen de una película de acción intensa y llena de suspenso, donde la resolución solo puede alcanzarse mediante la fuerza y la confrontación.

4. Discusión

La imagen del cartel de una película funciona como un resumen visual de la obra (Pooranalingam, 2024). Las ilustraciones pueden presentarse en forma de dibujos o fotografías (Poole y Poole, 2008). La representación del cuerpo femenino como objeto pornográfico ha sido durante mucho tiempo un tema controversial en diversas sociedades, derivado de dos polos en la valoración del cuerpo humano —especialmente el de las mujeres— como objeto sexual (Mestre-Bach et al., 2024). Varios factores contribuyen a este fenómeno. En primer lugar, las mujeres suelen considerarse una fuente de felicidad, placer, intimidad, estatus social y expresión artística (Lorde, 2021). El sexo se percibe a menudo como una fuente de paz interior, inspiración e incluso un propósito fundamental de la existencia humana. En segundo lugar, criticar o censurar la sexualidad puede afectar negativamente a las propias mujeres. Desde el pensamiento feminista radical, el género se considera la raíz del sexismo (discriminación social basada en el género) y de la ideología patriarcal (Lawford-Smith, 2022). Este enfoque señala que los hombres, debido a factores biológicos y políticos, dominan los cuerpos de las mujeres y las convierten en objetos sexuales (Bareket y Fiske, 2023).

Los carteles de cine, como medio, tienden a representar la violencia visual y la victimización de las mujeres (Wolf, 2014). La violencia en forma de pornografía constituye una forma de abuso contra ellas, donde el cuerpo femenino se cosifica con fines comerciales (Amankaviute y Zalnieriute, 2023). Los productores utilizan deliberadamente a las mujeres como objetos ajustados a criterios de belleza y sensualidad para obtener beneficios económicos. Esto genera estereotipos y opiniones que responsabilizan a las propias mujeres de la existencia de contenidos

pornográficos (Patria et al., 2021). El predominio de figuras masculinas en los carteles de cine indonesios (Aryanto et al., 2019) refuerza la idea de que las mujeres funcionan como un argumento de venta adicional para las películas (Patria et al., 2019).

4.1. Mujeres masculinas

Los carteles de películas de acción representan las peleas protagonizadas por los actores. En *Balada Tiga Jagoan* (1990) y *Bidadari Berambut Emas* (1992), se muestra a mujeres empuñando armas de cañón largo y corto (pistolas). Algunas armas apuntan hacia el público y otras hacia los hombres. Esta visualización evidencia la presencia de rasgos asociados a la masculinidad en los personajes femeninos, así como un rechazo a la subordinación. Con las armas, las mujeres son retratadas como poseedoras de poder en su entorno. Sin embargo, aunque empuñan armas, continúan usando ropa ajustada que acentúa sus cuerpos, combinada con maquillaje llamativo.

El cartel de *Balada Tiga Jagoan* muestra cuatro series de fotografías donde destacan mujeres armadas. En la primera, una mujer empuña armas de cañón largo; dos están de pie y una aparece medio arrodillada. Todas llevan ropa ajustada y de colores vivos —como el rojo— y, para reforzar la impresión masculina, visten trajes de cuero. En las segunda y tercera series, las mujeres aparecen acompañadas por un hombre, y las armas que sostienen son pistolas, no armas largas.

Según la teoría de la subordinación de género, las mujeres suelen situarse por debajo de los hombres (Mansour, 2016). Sin embargo, en los dos carteles analizados ocurre lo contrario: la mujer aparece en una posición superior. Esto demuestra



Figura 3: Mujer sosteniendo un arma en el póster.
Fuente: PT Lia Indah Swastika Film (1990)

que las mujeres pueden dominar a los hombres si poseen poder y control sobre la situación. Las representaciones visuales contemporáneas muestran cada vez más a mujeres adoptando posturas seguras y manteniendo dominio espacial, desafiando las nociones tradicionales de inferioridad (Santoniccolo et al., 2023). Elementos como el encuadre, la perspectiva y la dirección de la mirada contribuyen a realzar a los personajes femeninos, proyectando dominio e importancia sobre sus contrapartes masculinas (Navarro y Adriano, 2024).

A finales de los años ochenta y principios de los noventa, algunas mujeres indonesias empezaron a aparecer en películas de acción con habilidades en artes marciales. No obstante, fueron representadas con frecuencia como objetos de atractivo sexual. Con la llegada masiva de películas occidentales, los cines indonesios adoptaron colaboraciones con actores y actrices internacionales para mantener la demanda del mercado. Una de ellas fue Cindy Rothrock, quien protagonizó *Bidadari Berambut Emas*, interpretando a una campeona de kickboxing que busca vengar la muerte de su esposo.

La teoría de los estereotipos de género sostiene que las mujeres se asocian tradicionalmente con tareas domésticas y con la falta de capacidad para desempeñar roles de liderazgo (Amankaviciute y Zalnieriute, 2023). Sin embargo, en los carteles analizados, las mujeres aparecen empuñando armas y desempeñando roles asociados a sectores dominados por hombres, como el militar. Las

armas funcionan como símbolos de poder y control, reforzando la idea de que las mujeres también pueden ejercer autoridad sobre hombres y sobre su entorno.

4.2. Mujeres luchando contra hombres

Los carteles de películas de acción no solo muestran a mujeres empuñando armas, sino también enfrentándose físicamente a hombres, en combates uno contra uno. En estas escenas, las mujeres suelen aparecer como agresoras: golpean, dan puñetazos o propinan patadas. Por su parte, los hombres adoptan posiciones defensivas o muestran expresiones de dolor. Esta inversión de la dinámica de género tradicional refleja un cambio en la cultura visual del cine de acción, donde las mujeres se representan cada vez más como agentes activos y poderosos.

A menudo se destaca a las mujeres mediante posturas corporales abiertas y miradas directas, enfatizando fuerza y dominio (Navarro y Adriano, 2024). Las representaciones mediáticas han empezado a alejarse de estereotipos pasivos, mostrando a mujeres empoderadas y activas incluso en géneros tradicionalmente dominados por hombres (Santoniccolo et al., 2023). Los carteles de cine muestran una evolución gradual en la que las mujeres dejan de ser figuras decorativas para convertirse en protagonistas combativas que desafían normas patriarcales. Estas estrategias visuales revelan que los carteles no solo promocionan entretenimiento, sino que también funcionan como textos culturales que



Figura 4. Mujer peleando con un hombre en el póster de la película *Balada Tiga Jagoan* (La balada de los tres héroes, 1990) y *Bidadari Berambut Emas* (El ángel de cabello dorado, 1992)

Fuente: PT Lia Indah Swastika Film y PT. Rapi Film (1990, 1992)

negocian relaciones de poder entre géneros y representan a mujeres capaces de dominar a hombres en combates directos (Sehrawat et al., 2025).

En los carteles de *Balada Tiga Jagoan* (La balada de los tres héroes, 1990), se representa a mujeres golpeando con fuerza a hombres con las manos, golpeándoles en la cabeza. Las mujeres muestran una expresión seria y tensa mientras golpean a los hombres, mientras que estos soportan el dolor de los golpes. La ropa que llevan las mujeres, como chaquetas y pantalones largos, facilita los movimientos de lucha y transmite masculinidad,

ya que los pantalones se asocian tradicionalmente con los hombres. Las chaquetas cortas refuerzan la impresión masculina. Las mujeres patean a los hombres que tienen delante. Sus patadas son altas, dirigidas a la parte superior del cuerpo (la cabeza de los hombres). Los hombres son más altos que las mujeres, por lo que las piernas de estas últimas se extienden más allá de sus cabezas, lo que hace que sus cuerpos se inclinen ligeramente hacia abajo para mantener el equilibrio.

La vestimenta que lleva Cindy Rothrock difiere de la de las actrices indonesias. Aunque llevan el mismo estilo de ropa, compuesto por pantalones y una chaqueta o blazer, los colores elegidos son



Figura 5: Mujer peleando con un hombre en el póster de la película *Balada Tiga Jagoan* (La balada de los tres héroes, 1990) y *Bidadari Berambut Emas* (El ángel de cabello dorado, 1992)

Fuente: PT Lia Indah Swastika Film y PT. Rapi Film (1990, 1992)

diferentes. Cindy opta por colores pastel (azul claro y amarillo) con pantalones largos negros, mientras que las actrices indonesias visten de rojo y negro. No todas las estrellas de acción femeninas utilizan accesorios que transmiten una impresión femenina. La impresión femenina es evidente en el peinado; las actrices indonesias suelen elegir melenas que caen por debajo de los hombros, mientras que el cabello de Cindy es más corto.

4.3. Las mujeres son impotentes

Los dos carteles no solo muestran el lado masculino de las mujeres (portar armas), sino también escenas donde aparecen en posición vulnerable, debajo de un hombre. La mujer parece débil e indefensa, inmovilizada por el hombre que está encima. Él la mira fijamente mientras la sujeta de la mano y el hombro; ella responde con una mirada perdida. Ambos están completamente vestidos.

En el marco de la subordinación de género, se espera que las mujeres se encuentren por debajo de los hombres (Mansour, 2016). Ambos carteles representan a mujeres en posiciones de debilidad, vulnerables a la explotación física. Las expresiones de miedo refuerzan esta idea de impotencia frente al dominio masculino. La colocación de estas imágenes en el centro del cartel indica que se utilizan como elementos llamativos (publicitarios), basados en la idea de

la mujer como “sexo débil”. Esto coincide con la afirmación de Woodrich de que las mujeres son representadas como objetos sexuales en los carteles de cine (Woodrich, 2016).

Las mujeres tienen una relación dinámica con la ropa, negociando entre identidad personal, expectativas culturales y representaciones sociales (Guy y Banim, 2000). En los carteles analizados, las mujeres visten predominantemente negro, con detalles en rojo y prendas de cuero. El negro simboliza poder, misterio y control; el rojo, pasión, peligro e intensidad. El cuero se asocia con dureza, rebeldía y erotismo. Estos elementos proyectan a las mujeres como figuras simultáneamente deseadas y temidas, generando una representación que combina empoderamiento y vulnerabilidad.

Estudios recientes indican que estas representaciones aún se basan en la sexualización y cosificación femenina, reforzando estereotipos de deseabilidad (Santonniccolo et al., 2023). Desde un análisis multimodal, se observa que la vestimenta funciona como un dispositivo semiótico que codifica feminidad, sexualidad y poder, mostrando cómo los medios visuales negocian la tensión entre agencia femenina y representación patriarcal (Ikhlef y Awad, 2023). Incluso en géneros de acción, las mujeres siguen infrarrepresentadas en roles con autoridad narrativa, y los carteles suelen fragmentar o estilizar sus cuerpos para resaltar su atractivo (Lauzen, 2020).

5. Conclusiones

Un análisis de los carteles de películas de acción de principios de la década de 1990 revela que la representación de las mujeres, aunque aparentemente resistentes, equipadas y participativas en la batalla, sigue estando básicamente ligada a la razón de la objetivación sexual. La naturaleza dual de estas representaciones ilustra que las mujeres rara vez tenían la oportunidad de ser representadas más allá del ámbito del atractivo sensual, ya que su capacidad física siempre se transmitía mediante

atuendos sugerentes, un lenguaje corporal atractivo y señales visuales proyectadas para cautivar al público masculino. Esta tendencia muestra la hegemonía estructural de los hombres en la industria cinematográfica durante ese periodo, que actuaban tanto como creadores de medios visuales como principales espectadores de las películas de acción. Los carteles revelan que la promoción de las películas de acción no solo se rige por historias de violencia y combate, sino también por la explotación del cuerpo de las

mujeres como medio para obtener beneficios. Como resultado, el principal atractivo de estos carteles no radica tanto en promocionar a las mujeres como figuras de acción, sino en su atractivo sexual, lo que refuerza la idea de las mujeres como objetos de deseo en lugar de individuos independientes. La duplicación de motivos visuales como la exhibición del escote, los muslos y las posturas provocativas pone de relieve el vínculo existente entre la feminidad y la sexualidad, lo que limita la oportunidad de

que las mujeres sean vistas principalmente como luchadoras o iguales a los hombres. Por lo tanto, aunque los carteles aparentemente llevan a las mujeres al ámbito de la acción y el conflicto, al mismo tiempo apoyan los valores patriarcales al representar la fuerza femenina como algo característicamente vinculado al atractivo sexual, lo que pone de manifiesto un conflicto entre el permiso y la explotación que define una parte significativa de la cultura visual de género de la época.

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Psychological First Aid for Children: Perceptions of Professionals in Quito and Guayaquil, Ecuador

Primeros auxilios psicológicos en la infancia. Percepciones de profesionales en Quito y Guayaquil, Ecuador

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Psychological First Aid for Children: Perceptions of Professionals in Quito and Guayaquil, Ecuador

Primeros auxilios psicológicos en la infancia. Percepciones de profesionales en Quito y Guayaquil, Ecuador

Resumen

El objetivo del artículo es describir las percepciones de los profesionales de primera línea en torno a los Primeros Auxilios Psicológicos (PAP) direccionados a niños/as en contextos de violencia en dos ciudades de Ecuador. La hipótesis que se propone desarrollar es que el reconocimiento de los PAP como una herramienta esencial para la contención emocional y disminución del impacto del trauma agudo es tensionado por las barreras estructurales y formativas que comprometen la eficacia de la intervención. Para ello se diseñó una metodología mixta que involucró el trabajo con encuestas (n=60) y entrevistas semiestructuradas a profesionales de centros de atención psicológica, clínicas, hospitales y centros educativos que trabajan con infancias en las ciudades de Quito y Guayaquil. Los resultados mostraron que, los profesionales tienen una alta comprensión teórica del trauma agudo, aunque la capacitación en primeros auxilios psicológicos es percibida como insuficiente. Asimismo, los profesionales afirman que la falta de protocolos claros intensifica la revictimización de los sujetos que han sufrido violencia.

Palabras clave: profesionales, infancia, violencia, primeros auxilios psicológicos, Ecuador.

Abstract

The aim of this article is to describe frontline professionals' perceptions regarding the implementation of Psychological First Aid (PFA) directed at children in contexts of violence in two Ecuadorian cities. The central hypothesis to be developed is that the recognition of PFA as an essential tool for emotional containment and for mitigating the impact of acute trauma is strained by structural and training-related barriers that undermine the effectiveness of interventions. To this end, a mixed-methods design was employed, involving surveys (n=60) and semi-structured interviews with professionals from psychological care centers, clinics, hospitals, and educational institutions working with children in Quito and Guayaquil. The findings indicate that professionals possess a strong theoretical understanding of acute trauma, although training in psychological first aid is perceived as insufficient. Furthermore, participants emphasize that the absence of clear protocols exacerbates the re-victimization of individuals who have experienced violence.

Keywords: professionals, childhood, violence, psychological first aid, Ecuador.

1. Introduction

Violence against children and adolescents is one of the most critical social problems on the global stage. Its ramifications not only violate fundamental human rights but also leave a deep mark on victims' emotional, physical, and social development (Jiménez-Díaz, 2025). Therefore, early and adequate care is a fundamental pillar for their protection, as it mitigates the harmful effects of revictimization and prevents long-term consequences, such as depression and anxiety disorders (Niño Vega, 2022; Santamaría & Tapia, 2018).

In this context, the role of frontline professionals, such as psychologists, social workers, educators, and judicial personnel, is crucial because they are the victims' first point of contact with the protection system (Beristain & Romero, 2012; Inter-Agency Standing Committee [IASC], 2011). However, it has been documented that, in contexts such as Ecuador, many teachers lack the necessary training to intervene effectively, despite recognizing the importance of first aid for their performance (Caicedo & Zumbado, 2023; Soliz, 2018).

In this regard, Caballero (2024) notes that even in university psychology training, there remains a gap in the systematic teaching of PAP, which limits the preparation of future professionals. A professional without adequate training could engage in an inappropriate practice that aggravates the crisis, minimizes the child's feelings, and causes revictimization without even realizing it (Cortés & Figueroa, 2015; Rodríguez, 2024).

Globally, violence against children is an endemic evil that has infiltrated the social fabric (Santamaría & Tapia, 2018). The World Health Organization (WHO) estimates that 41,000 children under the age of 15 die each year from homicide, a figure that, according to experts, underestimates the true magnitude of the problem (Pan American Health Organization, 2002). It is estimated that more than one billion children worldwide suffer some form

of sexual abuse each year, and a direct correlation has been identified between early trauma and vulnerability in adulthood (Malta et al., 2025; Niño, 2020). Prolonged exposure to violence, even as a witness, can disrupt the nervous and immune systems and lead to limitations in social, emotional, and cognitive development.

In Latin America, childhood trauma is a risk factor for vulnerability in adulthood. A study in Brazil found that violence varies with age, with neglect being the most common type of abuse in children under 1 year of age, and sexual violence in those aged 2 to 5 years, with family members as the main perpetrators and the home as the most common place for incidents (Malta et al., 2025). For example, the comprehensive early childhood care policy in El Salvador, called "Crecer Juntos" (Growing Together), demonstrates a preventive approach that seeks to attack violence at its roots, considering that aggression can originate in the earliest stages of development (Gutiérrez de Doradea, 2024; Valencia & Trejos, 2013). Similarly, after Hurricane Otis in Acapulco, Mexico, the application of PAP in minors showed that immediate care not only reduces distress but also facilitates early emotional recovery and prevents later complications (Quevedo & Vázquez, 2024).

In this regard, research on the effectiveness of Psychological First Aid (PFA) has revealed significant findings. The ABCDE Manual highlights that PAP is a brief and immediate aid to restore the emotional, physical, and behavioral stability of the person experiencing a crisis and can be provided by anyone, not necessarily a psychologist (Cortés & Figueroa, 2015; Fundación Proinco et al., 2020). PFA aims to reduce acute stress and promote adaptive coping in the medium- and long-term (Figueroa et al., 2024).

However, scientific evidence on their effectiveness remains limited, underscoring the need for further research to determine their

actual impact and mechanisms of action (Becerra et al., 2021). A professional without adequate training could engage in inappropriate practices that aggravate the crisis, minimize the child's feelings, and unknowingly cause revictimization (Cortés & Figueroa, 2015; Rodríguez, 2024).

Within this framework of debate, this article aims to describe the perceptions of frontline professionals regarding Psychological First Aid (PFA) for children in contexts of violence in two cities in Ecuador. From there, the following question arises: How do frontline professionals implement the guidelines for Psychological First

Aid aimed at children in contexts of violence in the cities of Quito and Guayaquil?

The hypothesis proposed is that the recognition of PFA as an essential tool for emotional support and reducing the impact of acute trauma is hampered by structural and training barriers that compromise the effectiveness of the intervention. Likewise, it is proposed that professional decision-making, which is more driven by emotion than by knowledge and rationality, negatively affects the effectiveness of psychological first aid (Cosentino et al., 2023). To develop and substantiate this argument, a mixed methodological design was used, as described in the following section.

2. Materials and methods

To address the research problem, a mixed-methods design was developed that combined quantitative and qualitative techniques. The aim was to achieve a comprehensive, complete, and holistic understanding of the perceptions that frontline professionals express about Psychological First Aid (PFA).

Sample

The study population consisted of frontline professionals from psychological care centers, clinics, hospitals, and educational centers in Ecuador who work with children in contexts of violence in the cities of Quito and Guayaquil, Ecuador. The participants, selected for their professional role and direct contact with children, represented a key source of information for understanding the dynamics of immediate care and revictimization. información clave para comprender las dinámicas de la atención inmediata y la revictimización.

The fieldwork was carried out between August and September 2025.

The sampling technique used was non-probability convenience sampling, selected due to the difficulty in accessing a complete list of the population that met the research

criteria. Therefore, a strategy was chosen that allowed participants to be selected based on their availability and accessibility in Quito and Guayaquil. The professionals were contacted through institutional and academic networks, and they were invited to participate voluntarily in the study.

Techniques and instruments

Quantitative data were produced through a survey of 60 frontline professionals. The following inclusion and exclusion criteria were established for selection. The inclusion criteria were: 1) professionals with at least one year of experience in their profession; 2) working directly with children who are victims of violence; and 3) residing and practicing their profession in Ecuador. Exclusion criteria included those who did not meet the above requirements or did not provide informed consent.

An ad hoc Likert-scale questionnaire was used to assess professionals' self-perceptions and the effectiveness of interventions in cases of revictimization. The survey was conducted through an online form using Google Forms. Participants received a link that included the previously validated Likert scale. This method

ensured uniformity in data collection and facilitated its subsequent export to a digital database for processing. The instrument assessed three categories: level of knowledge and training in PAP, quality of immediate psychological care, and application of protocols for the prevention of revictimization. Each question was rated on a scale of 1 to 4.

The first category, Level of Knowledge and Training, consisted of 8 items designed to assess professionals' experience with formal training and the use of models such as ABCDE. This section was crucial to the objective of assessing preparedness, as insufficient training is a key factor in revictimization. The instrument, therefore, sought to quantify perceptions of a lack of knowledge among the study population. The second category, Quality of Immediate Psychological Care, consisted of eight items that inquired about the prioritization of emotional support and the suitability of the care environment. These items allowed the study to assess whether environmental conditions are perceived as favorable for the emotional stabilization of the minor. The perception of a safe environment is essential to reducing the impact of a traumatic event.

Using a qualitative technique, semi-structured interviews were conducted to delve deeper into participants' experiences, capturing their narratives and perceptions in greater detail. The interviews were structured around five thematic areas: training, impact of trauma, experiences of applying PAP, institutional obstacles, and suggestions for improvement.

The two data production instruments were validated by expert judgment. Four professionals

with extensive experience in clinical psychology and in caring for child victims of violence in Ecuador were selected. Each question in the questionnaire was assessed based on four key criteria: adequacy, clarity, relevance, and consistency. Once the questionnaire was approved, its reliability, i.e., the internal consistency of the instrument, was reviewed. To do this, SPSS statistical software was used to calculate Cronbach's alpha coefficient. Values of 0.965 for the first category and 0.70 for the second indicate that both constructs have excellent and acceptable reliability, respectively, allowing the research results to be validated.

Data processing

All data were analyzed using two computer programs. SPSS software was used to analyze quantitative data. Likewise, qualitative data were processed and categorized using the ATLAS. The TI program, employing the constant comparison method, enabled us to identify regularities in the statements made by professionals. This allowed us to triangulate the data and achieve a dense description of the perceptions that frontline professionals express about Psychological First Aid (PFA).

Finally, the results were presented in a clear and organized manner. The quantitative findings were presented in tables and graphs (frequency distributions and cross-tabulations), while the qualitative results were presented through textual quotations from participants, grouped by thematic areas. The integration of both results was key to providing a comprehensive view of the issue, as presented in the next section.

3. Results

First, Category 1: Level of knowledge and training in PAP was established to assess professionals' perceptions of their training and the importance of emotional support in caring for

children who are victims of violence. The data revealed a significant gap between the assessment of emotional support and formal training in PAP. Only 13.34% of professionals reported receiving

formal training or regularly participating in workshops, while 36.66% considered emotional support a priority in initial care.

The professionals stated that emotional support is intuitively recognized as essential, but that its application lacks technical support. One psychologist commented: “They teach us to provide support, but not how to do it well. There are no clear protocols, only intuition.”

The results responded to the specific objective, showing that the perception of the importance of

emotional support is high, but it is not accompanied by systematic or institutionalized training. The category for this objective was “Quality of immediate psychological care.” The objective was to analyze how knowledge about acute trauma influences the implementation of PAPs and the early resilience of the child population served. Most participants reported understanding the impact of acute trauma (45%) and being able to identify post-traumatic symptoms (46.67%). However, only 15% reported familiarity with the ABCDE model, suggesting a disconnect between theoretical understanding and practical application.

Table 1. Perception of training in PAP and emotional support (N = 60)

Source: Prepared internally based on surveys of frontline professionals in Quito and Guayaquil, (2025).

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have received formal training in PAP	1,67 %	16,67 %	18,33 %	11,67 %	1,67 %
I regularly participate in workshops or courses on PAP	1,67 %	15,00 %	20,00 %	11,67 %	1,67 %
Emotional support is prioritized in initial care	1,67 %	6,67 %	5,00 %	28,33 %	8,33 %

Table 2. Knowledge about acute trauma and resilience (N = 60)

Source: Prepared internally based on surveys of frontline professionals in Quito and Guayaquil, (2025).

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am familiar with the ABCDE model for the application of PAP	1,67%	13,33%	20,00%	13,33%	1,67%
I understand how acute trauma affects child development	1,67%	0,00%	3,33%	26,67%	18,33%
I identify post-traumatic symptoms in the children I treat	1,67%	1,67%	0,00%	25,00%	21,67%
I recognize risk and protective factors that influence resilience	1,67%	1,67%	1,67%	28,33%	16,67%

Respondents acknowledge that knowledge about trauma allows for more empathetic intervention, but that lack of technical training limits its effectiveness. One participant noted: “We know that trauma leaves scars, but we do not always know how to act without causing harm.”

The results met the objective, showing that knowledge about trauma is present but does not

translate into adequate technical application, which would affect children’s resilience. Category 3: Application of protocols to prevent revictimization. The objective for this category was to identify the relationship between revictimization and the effectiveness of PAPs in order to propose improvements in care processes. 45% of professionals consider PAPs effective, but only 30% report applying systematic protocols.

Table 3. Perception of revictimization and application of PAPs (N = 60)
Source: Prepared by the author based on surveys of frontline professionals in Quito and Guayaquil, (2025).

Statement	Strongly disagree	EDisagree	Neither agree nor disagree	Agree	Strongly agree
I consider PAPs to be an effective tool in initial care	1,67%	1,67%	1,67%	23,33 %	21,67%
I use PAP protocols in my professional practice	1,67%	13,33%	5,00%	23,33 %	6,67%
Children must repeat their testimony in multiple instances	3,33%	30,00%	5,00%	8,33 %	3,33%
Clear protocols are applied to ensure non-revictimizing treatment.	1,67%	8,33%	3,33%	25,00 %	11,67%
Psychological care respects dignity and integrity	1,67%	0,00%	1,67%	23,33 %	23,33%
The process guarantees the emotional and psychological protection of the minor	1,67%	1,67%	1,67%	21,67%	23,33%

In addition, 33.33% disagree that children should repeat their testimony, revealing institutional tensions that favor revictimization.

Professionals expressed frustration at the lack of institutional protocols to prevent revictimization. M. Hidalgo (personal communication, August 19, 2025) stated: “The system forces us to repeat interviews. That is revictimization, even if they do not say so.” The results met the objective, showing that PAPs are valued as effective, but their impact is limited by the absence of institutional protocols that guarantee non-revictimizing treatment.

The integration of quantitative and qualitative findings not only validates the data’s internal consistency but also enables a deeper, more contextualized understanding of the realities faced by frontline professionals. The quantitative results showed a high valuation of emotional support as an essential component of initial care; however, this perception contrasts with the limited formal training in Psychological First Aid (PFA) reported by most participants. This training

gap is explained and amplified by the qualitative findings, which show that professionals describe their preparation as “self-taught or insufficient,” confirming the absence of systematic institutional training processes. Likewise, the quantitative finding that 30% of respondents disagree that children should repeat their testimony in multiple instances is complemented by the narratives collected in the interviews. These reveal a positive perception of the usefulness of PAPs in reducing immediate distress, but also a deep frustration with bureaucratic processes and the lack of clear protocols that, in practice, perpetuate revictimization.

In summary, the data as a whole confirm that professionals have the willingness and theoretical knowledge necessary to provide emotionally safe care. However, they face structural barriers and training deficiencies that limit the practical application of PAPs. These findings underscore the urgency of strengthening both technical training and institutional frameworks in order to ensure comprehensive and non-revictimizing care for child victims of violence.

4. Discussion

The results of this research reveal a structural tension between the ethical disposition of frontline professionals and the training and institutional conditions that limit the practical application of Psychological First Aid (PFA) in contexts of child violence. This tension is evident in the three analytical axes of the study: professional training, understanding acute trauma, and preventing revictimization

First, a critical gap was identified between the intention to provide emotional support and the technical preparation to do so. Although most participants highly valued support as an essential component of initial care, quantitative data revealed that less than 15% had received formal training in PFA or regularly participated in workshops. This gap was confirmed by interviews, in which professionals described their training as “self-taught,” “intuitive,” or “insufficient.” This finding aligns with that of Cosentino et al. (2023), who warn that emotion-based decision-making without technical support can compromise the intervention’s effectiveness and increase the risk of revictimization. In this sense, the “goodwill” of the professional is insufficient without clear protocols, systematic training, and specialized supervision.

Secondly, the study showed that professionals have a solid theoretical knowledge of acute trauma and its effects on child development. More than 45% of respondents said they understood how trauma affects children and were able to identify post-traumatic symptoms. This knowledge was supported by qualitative narratives, which accurately described the emotional, physical, and behavioral manifestations of trauma. This finding is relevant, as clinical recognition of trauma is the first step toward appropriate intervention and fostering resilience in children (Santamaría & Tapia, 2018). However, the low level of familiarity with structured models such

as ABCDE, reported by only 15% of participants, suggests that this knowledge does not necessarily translate into effective technical practice. As Niño Vega (2022) points out, structural violence in school and community contexts increases the vulnerability of children, reinforcing the need for evidence-based preventive interventions.

Finally, the discussion on the effectiveness of PAPs and the prevention of revictimization reveals a systemic problem. Although professionals perceive PAPs as an effective tool for immediate emotional support, the results show that only a minority systematically apply protocols. In addition, 33% of respondents disagree that children should repeat their testimony in multiple instances, highlighting a disconnect between clinical practice and institutional procedures. Qualitative interviews deepen this tension, showing that professionals feel frustrated when their efforts are undermined by bureaucratic processes that perpetuate revictimization. This finding coincides with that reported by Barrio et al. (2023), who identified that even in health and education-related careers, knowledge of psychological first aid is limited, reflecting a widespread problem in the region.

Taken together, the results suggest that the effectiveness of PAPs does not depend solely on the professional’s individual knowledge, but on institutional conditions that enable their consistent and sustained application. The absence of inter-institutional protocols, the fragmentation of care systems, and the lack of continuing education constitute structural barriers that must be addressed through public policy. In the Ecuadorian context, this implies strengthening professional training programs, designing integrated care pathways, and ensuring that protection processes respect the dignity and emotional well-being of children who are victims of violence.

5. Conclusions

This research provided a comprehensive exploration of the perceptions of frontline professionals in Ecuador regarding the application of Psychological First Aid (PFA) in the care of child victims of violence. Through a mixed-method approach, it was found that PFA is recognized as an essential tool for immediate emotional support and that professionals have a solid theoretical understanding of the impact of acute trauma on child development. However, this ethical and cognitive disposition is constrained by structural and training barriers that compromise the intervention's effectiveness.

The findings revealed a critical gap between the intention to provide emotionally safe care and the technical preparation to do so. Most participants reported not having received formal training or regularly participating in continuing education on PAP. This lack of training, coupled with the absence of standardized protocols and institutional fragmentation, creates conditions that favor systemic revictimization. The fact that children must repeat their testimony in multiple instances, as evidenced in both quantitative data and interviews, constitutes a direct violation of their rights and a failure of the protection system.

Likewise, it was found that knowledge about acute trauma, although present, does not necessarily translate into effective technical practice. Low familiarity with structured models such as ABCDE limits professionals' ability to intervene in a protocolized manner, especially in highly emotional and urgent contexts. This disconnect between knowledge and practice underscores the need to strengthen professional training processes, not only in technical content but also in practical skills, ethical criteria, and inter-institutional coordination.

In this sense, the effectiveness of PAPs cannot depend solely on the professional's individual will. It requires a robust, coordinated care system backed by public policies that guarantee the emotional and psychological protection of children. The research underscores the urgency of designing integrated care pathways, establishing clear protocols between the health, education, and justice sectors, and promoting an institutional culture that prioritizes children's dignity, well-being, and resilience.

6. Recommendations

This study provides relevant empirical evidence for the design of continuing education programs, the review of institutional practices, and the formulation of public policies to prevent revictimization. In the Ecuadorian context, where training and structural gaps persist, the results of this research constitute a call to action: it is necessary to transform goodwill into technical capacity and ethical awareness into practical, humanized, and protective care systems.

Likewise, given the limited sample size ($n=60$) and the non-probabilistic sampling for convenience, we are aware that the results may be biased, preventing generalization and inferential analysis. We therefore reaffirm that the results presented in this article are descriptive and exploratory in nature and may serve as a basis for future research that expands the sample and deepens the analysis.

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Voces de estudiantes de inglés como lengua extranjera: preferencias y percepciones sobre la retroalimentación correctiva escrita proporcionada por los profesores

EFL Students' Voices: Preferences and Perceptions on Teacher-provided Written Corrective Feedback

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Resumen

La retroalimentación correctiva escrita (RCE) es una práctica docente esencial para desarrollar la escritura en inglés; sin embargo, la investigación en este ámbito sigue siendo limitada dentro y fuera de Latinoamérica. Este estudio, centrado en un contexto específico, analizó las percepciones de estudiantes de inglés B1 sobre los objetivos, estrategias y alcances de la RCE docente mediante un enfoque mixto con diseño convergente y de variante de cuestionario tipo Likert. El Cuestionario de Percepciones sobre la RCE ($\alpha = .67$) se aplicó a 189 estudiantes universitarios ecuatorianos. Los resultados evidenciaron preferencia por la retroalimentación directa y por la indirecta acompañada de información correctiva, percibidas como guías claras para la revisión de errores y el aprendizaje autónomo. Asimismo, los participantes valoraron la retroalimentación lingüística y de contenido, y manifestaron interés en recibir corrección integral de sus errores. No obstante, mostraron comprensión limitada de la retroalimentación centrada en ideas. Se discuten implicaciones pedagógicas y limitaciones del estudio.

Palabras clave: retroalimentación docente, retroalimentación correctiva escrita, escritura en lengua extranjera, preferencias de estudiantes de inglés como lengua extranjera, nivel universitario.

Abstract

Written Corrective Feedback (WCF) is a common teachers' practice to develop EFL writing skills in students; however, research in this field remains scant within and beyond Latin America. This context-specific study analyzed B1 EFL students' perceptions on the targets, strategies, and scope of teacher WCF through a mixed-methods approach adopting a convergent design with a Likert-type questionnaire variant. The Perceptions of WCF Questionnaire ($\alpha = .67$) was administered to 189 Ecuadorian university students. Quantitative and qualitative analyses showed a preference for direct feedback and indirect feedback accompanied by corrective information as they guided error revision clearly and promoted autonomous learning. Furthermore, the participants valued WCF on linguistic and content elements and expressed interest in receiving comprehensive correction of their errors. Nevertheless, they showed limited understanding of idea-focused feedback. Pedagogical implications and study limitations are discussed.

Keywords: teacher-provided feedback, written corrective feedback, writing skills, EFL learners' perceptions and preferences, university level.

1. Introducción

Hoy en día, la educación busca promover la autonomía, la reflexión y la mejora continua de los alumnos mediante enfoques centrados en el estudiante (Ministerio de Educación, 2011). En este sentido, la retroalimentación correctiva escrita (WCF, por sus siglas en inglés), una práctica habitual entre los profesores de idiomas, contribuye a estos objetivos educativos al mejorar las habilidades de escritura en inglés. La WCF se refiere a las respuestas escritas que los profesores proporcionan a los errores de los alumnos en la escritura (Nanni y Black, 2017). Sin embargo, esta práctica no se limita únicamente a la corrección de errores, sino que también implica elogiar el rendimiento de los estudiantes. En consecuencia, la WCF proporcionada por el profesor funciona como una evaluación del grado en que los alumnos han adquirido las habilidades lingüísticas (Bitchener y Ferris, 2012).

Esta evaluación no se produce de una única forma ni se centra en un único aspecto, sino que puede variar en cuanto a sus estrategias, objetivos y alcance. Dos estrategias de retroalimentación comunes son la retroalimentación directa y la indirecta. En la retroalimentación directa, los errores se corrigen de forma explícita, mientras que en la indirecta se señalan los errores sin corregirlos (Bitchener y Ferris, 2012). Además, la WCF puede abordar tanto los errores relacionados con el contenido (contenido/ideas y organización) como los lingüísticos (gramática, vocabulario y mecánica) como objetivos (Al-Jarrah, 2016). Además, su provisión puede centrarse en todos, la mayoría o un número específico de errores. Cuando se corrigen todos los errores, la retroalimentación se considera exhaustiva o difusa, mientras que corregir solo algunos o un número específico de errores se considera selectiva o enfocada (Ellis et al., 2008). En general, la WCF puede adoptar diversas estrategias, objetivos y alcances.

Debido a su versatilidad y su papel en la escritura, la WCF proporcionada por los maestros ha sido objeto de una importante atención por parte de

la investigación. Su influencia en el dominio de los aspectos lingüísticos y/o relacionados con el contenido de la escritura se ha convertido en objeto de varios estudios que informan de su impacto positivo y recomiendan su uso en las aulas (Bagheri y Rassaei, 2022; Chingchit, 2024; Villavicencio y Argudo, 2021). Además, se han examinado las opiniones de los profesores sobre su papel. Desde su perspectiva, la WCF es valiosa para que los alumnos mejoren sus habilidades de escritura, y se favorecen especialmente las estrategias directas e indirectas (Mamad y Vigh, 2022; Yaseen et al., 2024). Por lo tanto, la WCF en sus diversas formas se ha aplicado e investigado ampliamente en entornos de aprendizaje de idiomas.

Aunque la investigación y los profesores apoyan el WCF, las prácticas en el aula no deben basarse únicamente en las opiniones de los profesores o los investigadores. Las decisiones en el aula también deben incorporar las perspectivas de los estudiantes, especialmente en entornos centrados en ellos. En Ecuador, las instituciones enseñan inglés mediante enfoques centrados en el estudiante (Ministerio de Educación del Ecuador, 2016) y, dado que los estudiantes son el núcleo del proceso de aprendizaje, se deben escuchar sus opiniones sobre las prácticas en el aula. Sin embargo, sus opiniones sobre el WCF siguen siendo escasas tanto dentro como fuera de Ecuador (Gedik Bal, 2022; González-Torres y Sarango, 2023). Por lo tanto, este estudio intenta identificar las percepciones y preferencias de los estudiantes universitarios de inglés como lengua extranjera (EFL) de nivel B1 con respecto al WCF proporcionado por los profesores en términos de estrategias, objetivos y alcances.

1.1. Revisión bibliográfica

Parece que la bibliografía actual sobre las percepciones de los estudiantes respecto a la WCF proporcionada por los profesores gira en torno a tres temas principales de interés, a saber, estrategias, objetivos y alcance, y destaca que,

en general, los estudiantes consideran que la retroalimentación es beneficiosa para desarrollar sus habilidades de escritura. En cuanto a las estrategias, las opciones directas e indirectas destacan como métodos preferidos para proporcionar retroalimentación; sin embargo, las preferencias de los estudiantes difieren en cuanto a la forma de la estrategia.

1.2. Percepciones sobre las estrategias de retroalimentación escrita

Por un lado, los alumnos prefieren la retroalimentación directa debido a la claridad de la corrección, que facilita la comprensión y evita errores similares en tareas posteriores (Ganapathy et al., 2020a; Yaseen et al., 2024). En particular, los alumnos prefieren las correcciones directas porque la retroalimentación indirecta no explica ni rectifica explícitamente los errores, lo que les deja con la incertidumbre de qué es lo que hay que cambiar (Kawashima, 2023; Rasool et al., 2023). Del mismo modo, los estudiantes esperan una retroalimentación directa con explicaciones metalingüísticas de por qué algo es incorrecto, lo que les permite recordarlo fácilmente y evitar repetir los errores (Ene y Yao, 2021; Rashtchi y bin Abu Bakar, 2019). Según Hamid et al. (2021), los comentarios metalingüísticos son necesarios, ya que los estudiantes suelen carecer de confianza en sus habilidades lingüísticas para corregir los errores de forma independiente.

Por otro lado, la retroalimentación indirecta se valora cuando incluye símbolos, códigos o ejemplos, ya que son orientativos y autoexplicativos y fomentan la comprensión (Cho y Park, 2019; Valentin-Rivera, 2023). Reynolds y Zhang (2022) sugieren que esta estrategia fomenta las interacciones entre profesores y alumnos, ya que estos últimos corrigen sus errores de forma independiente, lo que puede reflejar el grado de autonomía en su aprendizaje. Sin embargo, las preferencias de los alumnos por las estrategias directas o indirectas varían en función de los objetivos de corrección. Mientras que la retroalimentación indirecta se prefiere generalmente para cuestiones relacionadas con el contenido, la retroalimentación directa se valora para cuestiones lingüísticas.

Por último, Kim et al. (2020) y Mikulski et al. (2019) no observan una tendencia constante en las preferencias estratégicas. Los alumnos valoran ambas estrategias, independientemente de los códigos o el subrayado (indirecto) o las correcciones explícitas (directas). En este sentido, Mikulski et al. (2019) razonan que, cuando la WCF es clara, los alumnos pueden realizar correcciones de manera eficaz. Por último, Kim et al. (2020) recomiendan proporcionar retroalimentación durante la realización de la tarea en lugar de después, para mejorar la comprensión de los errores. En conclusión, no parece haber acuerdo sobre qué estrategia de WCF prefieren los estudiantes, ya que las preferencias varían en función de las necesidades de aprendizaje individuales.

1.3. Percepciones sobre los objetivos de la WCF

Una segunda área de interés son los objetivos. Los estudios muestran que los estudiantes aceptan la WCF en todos los aspectos de la escritura (contenido/ideas y características lingüísticas), aunque tienden a dar prioridad a la retroalimentación en determinadas áreas. A modo de ejemplo, Gedik Bal (2022) y Nanni y Black (2017) destacan que los alumnos prefieren recibir comentarios sobre la gramática y el vocabulario, y aunque los profesores podrían expresar su preocupación por centrarse en estos aspectos, los estudiantes responden positivamente a estas correcciones, especialmente en las aulas donde la precisión en la escritura es un objetivo fundamental (Mikulski et al., 2019). Por el contrario, Nguyen et al. (2021) y Nurie (2020) comunican que los alumnos prefieren comentarios sobre el contenido/las ideas y la organización cuando su principal interés es aclarar ideas (Reynolds y Zhang, 2022).

Estos resultados tan variados pueden deberse a diferentes factores. Como observan Nguyen et al. (2021), los objetivos preferidos difieren naturalmente dentro y entre las aulas, ya que los estudiantes son diversos. Además, la atención al contenido y a los aspectos lingüísticos puede reflejar la conciencia de los alumnos sobre su interdependencia a la hora de transmitir mensajes eficaces. Por último, Reynolds y Zhang (2022)

señalan que la WCF se percibe como innecesaria para los objetivos ya dominados, y que ciertos errores pueden ser más exigentes que otros debido a su profundidad de reflexión. En otras palabras, la corrección lingüística implica menos reflexión por parte de los estudiantes en comparación con los aspectos de contenido.

1.4. Percepciones sobre el alcance de la WCF

Las investigaciones sobre los ámbitos han arrojado resultados variados. En primer lugar, los estudios realizados en inglés como segunda lengua (ESL) o como lengua extranjera (EFL) indican que los alumnos tienden a considerar que los comentarios poco específicos son esenciales para comprender, aprender y retener las lecciones (Ganapathy et al., 2020b; Nouraey y Behjat, 2020; Yaseen et al., 2024). Nguyen et al. (2021) señalan que, por lo general, se prefiere un enfoque integral para lograr precisión, imitar la buena redacción y abordar la incapacidad de los estudiantes para detectar y corregir errores de forma independiente. Como resultado, se abordan aspectos lingüísticos y de contenido.

No obstante, otros trabajos sugieren que los estudiantes abogan por un enfoque selectivo. Esto se debe a que, a diferencia de la retroalimentación integral, la retroalimentación enfocada no abruma a los alumnos con revisiones extensas y detalladas (Ene y Yao, 2021; Saliu-Abdulahi y Hellekjær, 2020). Además, la retroalimentación selectiva puede fomentar la autocorrección y evitar que los alumnos se sientan desmotivados por las correcciones excesivas (Nguyen et al., 2021). Sin embargo, el alcance selectivo se ha estudiado principalmente en las correcciones lingüísticas, por lo que los conocimientos sobre los aspectos relacionados con el contenido siguen siendo escasos.

1.5. Percepciones sobre la WCF en América Latina

En América Latina, los estudios sobre la WCF son limitados y ofrecen una comprensión parcial de las percepciones de los estudiantes. López (2023) aborda exclusivamente los objetivos y las estrategias. El autor señala que los

estudiantes colombianos menos competentes prefieren las correcciones gramaticales, mientras que los estudiantes avanzados valoran la retroalimentación sobre la organización y la coherencia. Curiosamente, ambos grupos, especialmente los estudiantes avanzados, prefieren la retroalimentación indirecta acompañada de comentarios metalingüísticos. Por su parte, Westmacott (2017) examina las opiniones de seis estudiantes chilenos sobre la retroalimentación directa y la retroalimentación indirecta codificada a través de la investigación-acción. Los participantes prefieren la segunda estrategia para reforzar los conocimientos gramaticales, fomentar las respuestas activas a la retroalimentación y promover el aprendizaje autónomo. Sin embargo, los estudiantes señalan dos inconvenientes: la confusión inicial causada por los códigos y la incertidumbre sobre la precisión de sus correcciones. La autora reconoce que las conclusiones son limitadas, ya que el estudio tiene una muestra pequeña y se centra solo en dos estrategias. Por último, los estudios ecuatorianos se centran principalmente en si los estudiantes consideran valiosos los comentarios. En Narváez y Verdezoto (2021), los estudiantes identifican los comentarios como una práctica habitual en los cursos de inglés como lengua extranjera y comprenden su papel en el desarrollo de sus habilidades lingüísticas. Además, González-Torres y Sarango (2023) informan de que los alumnos destacan la contribución de la WCF al perfeccionamiento de sus habilidades de escritura, especialmente en gramática y vocabulario. En conjunto, las investigaciones sobre la práctica de la WCF y las percepciones de los estudiantes siguen siendo escasas en el contexto latinoamericano (Villavicencio, 2023).

Aunque existen esfuerzos por determinar las percepciones de los estudiantes sobre la WCF proporcionada por los profesores en términos de estrategias, objetivos y alcance, las pruebas disponibles siguen siendo limitadas. Los estudios actuales tienden a centrarse en los objetivos (por ejemplo, Rashtchi y bin Abu Bakar, 2019) o en las estrategias y el alcance (por ejemplo, Nanni y Black, 2017), descuidando su interrelación. Por consiguiente, es necesario realizar investigaciones que exploren simultáneamente las tres áreas. Además, no hay consenso en

las opiniones de los estudiantes con respecto a los objetivos, las estrategias y el alcance, probablemente debido a las diferencias entre los grupos de estudiantes en los distintos entornos de investigación. Esto subraya la necesidad de realizar estudios específicos para cada contexto, ya que generalizar los resultados parece poco práctico. Además, las pruebas dentro y fuera de América Latina siguen siendo escasas, lo que impulsa a seguir investigando en este campo. Lo más importante es que escuchar las opiniones de los estudiantes sobre las prácticas en clase es relevante cuando se debate sobre la educación centrada en el estudiante.

Por lo tanto, el objetivo de este estudio fue identificar las percepciones y preferencias de los estudiantes de inglés como lengua extranjera con respecto a la retroalimentación

escrita proporcionada por los profesores en las tareas de escritura en términos de estrategias, objetivos y alcance. Las siguientes preguntas de investigación guiaron el estudio:

1. ¿Qué estrategias de WCF proporcionadas por el profesor prefieren los estudiantes de inglés como lengua extranjera de nivel B1 en la escritura? ¿Por qué?
2. ¿Cuáles son las percepciones de los estudiantes de inglés como lengua extranjera de nivel B1 sobre la retroalimentación escrita proporcionada por los profesores en cuanto a los aspectos lingüísticos y relacionados con el contenido de la escritura? ¿Por qué?
3. ¿Qué tipo de alcance de la WCF proporcionada por el profesor prefieren los estudiantes de inglés como lengua extranjera de nivel B1 en la escritura? ¿Por qué?

2. Materiales y métodos

2.1. Enfoque y diseño de la investigación

Este estudio de métodos mixtos específico para este contexto empleó un diseño convergente con una variante de cuestionario. Según Creswell y Plano (2018), un diseño convergente integra datos cuantitativos y cualitativos para obtener una comprensión holística de un tema, y la variante del cuestionario, a través de sus preguntas abiertas, permite a los investigadores validar o confirmar los resultados cerrados. El cuestionario se administró de forma transversal, ya que los datos se recopilaban en un único momento (Creswell, 2015).

2.2. Entorno y participantes

El contexto de la investigación fue el Instituto de Idiomas de una universidad pública de Ecuador. El Instituto ofrece cursos gratuitos de inglés de los niveles A1 a B2 a los estudiantes universitarios como parte de los requisitos para obtener su título. La muestra consistió en nueve cursos de nivel B1 seleccionados mediante muestreo por conveniencia debido a su accesibilidad para el

investigador (Dörnyei y Dewaele, 2022). En total, 189 estudiantes (48 hombres y 141 mujeres) de entre 18 y 25 años completaron el cuestionario. Los participantes cumplían los siguientes criterios de inclusión: ser hablantes nativos de español, estar especializados en campos distintos al inglés y tener experiencia previa en recibir WCF impartido por profesores en el Instituto.

2.3. Instrumento

Se utilizó el cuestionario Perceptions of WCF. Esta herramienta de tipo Likert de cinco puntos fue adaptada de Chen et al. (2016), Nanni y Black (2017), Nemati et al. (2017) y Rashtchi y Bin Abu Bakar (2019), y constaba de cuatro secciones: información demográfica y sobre la segunda lengua (L2), preferencias en cuanto a estrategias de retroalimentación, percepciones sobre los objetivos de la retroalimentación y preferencias sobre el alcance de la retroalimentación. Las secciones sobre preferencias y percepciones incluían preguntas cerradas seguidas de preguntas abiertas que provocaban las razones detrás de las elecciones de los estudiantes.

La validez de la herramienta se garantizó mediante múltiples medidas. En primer lugar, la validez del contenido se respaldó adaptando preguntas de estudios publicados en revistas de alta calidad (Hamid et al., 2021). Además, la herramienta fue revisada por un colega con experiencia en la enseñanza del inglés como lengua extranjera, quien proporcionó comentarios sobre la claridad, la relevancia y la alineación de las preguntas con el alcance del estudio. Por último, se realizaron los ajustes oportunos antes de evaluar la fiabilidad del instrumento.

Asimismo, el instrumento se probó con 24 encuestados que compartían características similares con los participantes reales. La cumplimentación del instrumento llevó aproximadamente 15 minutos, lo que indica que era adecuado en cuanto al tiempo (Dörnyei y Dewaele, 2022). Los análisis estadísticos de la herramienta en su conjunto y de sus dos constructos (preferencias por estrategias y percepciones de objetivos) arrojaron coeficientes alfa de Cronbach de 0,67, 0,62 y 0,76, respectivamente, lo que indica una fiabilidad aceptable, ya que los coeficientes eran superiores a 0,60 (Dörnyei y Dewaele, 2022). Por último, los participantes en la prueba piloto no sugirieron ninguna modificación de los ítems.

2.4. Recopilación y análisis de datos

El instrumento se administró un mes antes de que los participantes completaran su curso de inglés B1. La administración consistió en informar a los participantes sobre el propósito del estudio, firmar un formulario de consentimiento y completar el cuestionario en papel en español. Nguyen et al. (2021) recomiendan utilizar la lengua materna de los participantes para minimizar los posibles problemas de competencia lingüística durante la realización del cuestionario. Tras recopilar las respuestas, se garantizó el anonimato y se codificaron los documentos para su posterior análisis.

Los datos cuantitativos se procesaron y analizaron en SPSS versión 25 para examinar las percepciones y preferencias de los encuestados respecto a los WCF en

el desarrollo de las habilidades de escritura. Siguiendo a Boone y Boone (2012), se aplicaron medianas, frecuencias y pruebas de chi cuadrado, ya que son procedimientos analíticos adecuados para datos de tipo Likert. La mediana era adecuada para los análisis, ya que las encuestas de tipo Likert tratan los ítems de forma individual y proporcionan datos ordinales para las respuestas (Boone y Boone, 2012), y no es sensible a los valores atípicos. Por último, se realizó la prueba de bondad de ajuste de chi cuadrado para cada ítem con el fin de identificar la distribución de las respuestas. Se estableció un nivel de significación del 5 % ($p < 0,05$) como criterio para aceptar o rechazar las hipótesis. Se establecieron las siguientes hipótesis:

H0: las distribuciones de las respuestas son iguales.

H1: las distribuciones de las respuestas son diferentes.

Los datos cualitativos se analizaron temáticamente para identificar las razones de los participantes detrás de sus elecciones. Braun y Clarke (2006) definen el análisis temático como «un método para identificar, analizar y reportar patrones dentro de los datos» (p. 7). Dado que el objetivo era proporcionar una descripción detallada de aspectos específicos de los datos, se utilizó el análisis deductivo para la codificación, y los análisis se basaron en la teoría (Braun y Clarke, 2006). En consecuencia, los elementos de las secciones dos a cuatro sirvieron como códigos iniciales para identificar las razones de los participantes para sus percepciones y preferencias.

Basándose en Braun y Clarke (2006), las razones se identificaron y clasificaron primero en los elementos correspondientes del cuestionario durante la familiarización con los datos. A continuación, se codificaron los patrones recurrentes dentro de las razones y posteriormente se agruparon en temas. Los códigos y los temas se produjeron a nivel semántico, ya que se extrajeron de los significados explícitos de los datos. A continuación, se describieron los temas en los resultados y posteriormente se discutieron.

Por último, la interpretación de los datos se llevó a cabo mediante la integración de los resultados cuantitativos y cualitativos (Creswell y Plano, 2018). El objetivo de esta integración era, en primer lugar, identificar las tendencias en las preferencias y percepciones de los estudiantes con respecto al WCF proporcionado por los

profesores y, a continuación, profundizar en la comprensión a través de las razones que subyacen a esas preferencias y percepciones. Para proteger la confidencialidad y cumplir con las normas éticas de investigación, se hace referencia a los participantes como «Encuestados 01 a 189».

3. Resultados

3.1. ¿Qué estrategias de WCF proporcionadas por los profesores prefieren los estudiantes de inglés como lengua extranjera de nivel B1 en la escritura? ¿Por qué?

La tabla 1 muestra que, según los resultados de la prueba de chi cuadrado ($p < .05$), las respuestas no se distribuyeron de manera uniforme, sino que se agruparon en un lado de la escala. La mayoría de los estudiantes coincidieron en que la retroalimentación directa (E y F) o indirecta (B y D) era útil. En particular, se prefirieron las estrategias indirectas cuando incluían alguna referencia orientativa, como la fuente de la información o la ubicación del error acompañada de códigos (B y D). Por el contrario, la mayoría consideró ineficaz señalar los errores sin corregirlos ni indicarlos (A y C).

Según los participantes, las opciones más votadas, B, D, E y F, servían como guías claras al proporcionar correcciones y explicaciones de los errores. Como afirmó el encuestado 17, «estas correcciones son muy detalladas y nos muestran exactamente dónde nos hemos equivocado» (12 de enero de 2023). El encuestado 42 se hizo eco de este sentimiento y explicó: «Elegí estas opciones porque creo que la retroalimentación es esencial para aclarar dudas y conceptos erróneos» (12 de enero de 2023).

Las estrategias también fueron bien recibidas, ya que ayudan a evitar errores similares en tareas futuras. Parece que las tareas anteriores pueden servir como fuente de información sobre los errores o como referencia para trabajos posteriores. El encuestado 58 reconoció: «Para mí, el enfoque más eficaz es identificar el error, explicar por qué es incorrecto y clasificarlo. Esto

Tabla 1. Percepciones de los estudiantes sobre la utilidad de las estrategias de retroalimentación proporcionadas por los profesores
Fuente: propia (2025)

Estrategia ^a	Frecuencia(%)					Mediana	χ^2 ^b
	Muy inútil	Inútil	Ni útil ni inútil	Útil	Muy útil		
A	28.57	33.33	23.81	7.41	6.88	2	106.51
B	6.88	17.99	22.75	28.04	24.34	4	14.65
C	29.63	28.57	25.4	9.52	6.88	2	94.67
D	0.53	3.17	8.99	33.86	53.44	5	100.98
E	0.53	1.06	5.29	29.63	63.49	5	131.65
F	1.06	2.12	3.7	4.23	88.89	5	130.16
G	70.74	14.89	9.04	1.6	3.72	1	228.05

a A = Subrayar el error sin corregirlo. B = Subrayar el error y luego remitirle a una fuente de información. C = Indicar el tipo de error sin localizarlo ni corregirlo. D = Localizar el error (por ejemplo, subrayándolo) e indicar también el tipo de error. E = Subrayar el error y corregirlo. F = Corregir el error y proporcionar una explicación de la corrección. G = Indicar simplemente que hay un error en la oración colocando una cruz junto a él, sin localizarlo ni corregirlo.

bdf = 2, $p < 0,05$

ayudará a evitar que se repitan errores similares» (19 de enero de 2023). Del mismo modo, el encuestado 61 señaló: «Que se destaquen y expliquen nuestros errores nos ayuda a aprender de ellos. Si en el futuro tenemos dudas sobre algo, podemos consultar nuestro trabajo anterior con las correcciones para guiarnos» (19 de enero de 2023).

Además, las estrategias indirectas B y D recibieron apoyo porque pueden promover el aprendizaje autónomo. Según el encuestado 35, «los comentarios del profesor son valiosos, pero es esencial que también hagamos nuestro propio trabajo; por eso la opción B es útil» (12 de enero de 2023). El encuestado 100 compartió una opinión similar: «Es necesario indicar las fuentes de información en los libros para fomentar el autoaprendizaje, y es muy útil que el profesor colabore explicando el error» (19 de enero de 2023).

En el caso de los comentarios directos, los participantes abogaron por las estrategias E y F, ya que facilitan la revisión de los comentarios. Los estudiantes prefirieron que se corrigieran sus errores de forma explícita en lugar de descifrarlos basándose en las indicaciones del profesor (comentarios indirectos). El encuestado 91 explicó: «Las estrategias son más directas, por lo que no tengo que perder tiempo tratando de averiguar qué quería decir o intentaba decir el profesor» (19 de enero de 2023). El encuestado

130 añadió: «El profesor debería mostrarme cuál debería haber sido la respuesta, porque a veces no revisamos los errores y nos quedamos con la duda de cuál fue el error» (13 de julio de 2023).

La oposición a las estrategias A, C y G surgió porque no se consideran comentarios genuinos debido a su falta de información correctiva. El encuestado 29 destacó: «No son comentarios porque solo indican que algo está mal sin explicar por qué» (12 de enero de 2023). El encuestado 33 añadió: «Son estrategias muy ambiguas que realmente no proporcionan una retroalimentación significativa, teniendo en cuenta que se trata de un idioma que aún estamos aprendiendo» (12 de enero de 2023).

Además, los participantes no percibían esas estrategias como catalizadores del aprendizaje, ya que podían crear confusión y dudas. El encuestado 07 comentó: «Resaltar un error no me muestra lo que hice mal; en cambio, me hace cuestionar cosas que creía haber hecho bien» (12 de enero de 2023). Además, el encuestado 88 afirmó: «No explicar ni corregir el error puede generar mucha confusión, por lo que los estudiantes seguirán cometiendo el mismo error» (19 de enero de 2023).

Por último, la ausencia de correcciones específicas se consideró desmotivadora, lo que llevaba a los estudiantes a perder interés en el aprendizaje y reflejaba una percepción de falta de

Tabla 2. Percepciones de los estudiantes sobre la utilidad de la retroalimentación sobre el contenido y los errores lingüísticos proporcionada por los profesores
Fuente: propia (2025)

Categoría de error ^a	Frecuencia (%)						χ^2 ^b
	Muy inútil	Inútil	Ni útil ni inútil	Útil	Muy útil	Mediana	
Contenido/ideas	1.06	5.29	10.05	34.92	48.68	4	11.28
Organización	0.53	2.12	4.76	25.4	67.2	5	0.82
Gramática	0	0.53	3.7	15.34	80.42	5	6.74
Vocabulario	0	1.06	4.23	27.51	67.2	5	4.36
Mecánica	1.59	5.29	6.35	28.57	58.2	5	6.61

^a Aspectos relacionados con el contenido: Contenido/ideas = Relevancia, desarrollo y claridad de las ideas. Organización = Coherencia y cohesión, género y estructura de los párrafos. Aspectos lingüísticos: Gramática = Reglas y estructuras que rigen la combinación de palabras para formar oraciones con sentido. Vocabulario = Elección de palabras. Mecánica = Puntuación, ortografía, mayúsculas y párrafos.

^b $df = 2$, $p < .05$

interés del profesor en su progreso. El encuestado 79 explicó: «Si no me dicen por qué hay un error o dónde está, o si solo ponen una X, me sentiría mal sin saber qué estoy haciendo mal, lo que me haría perder el interés por el inglés o dejar de aprenderlo» (19 de enero de 2023). Del mismo modo, el encuestado 111 añadió: «Las estrategias indican una falta de interés en los estudiantes» (13 de julio de 2023).

3.2. ¿Cuáles la percepción de los estudiantes de inglés como lengua extranjera de nivel B1 sobre la retroalimentación escrita proporcionada por el profesor en cuanto a los aspectos lingüísticos y relacionados con el contenido de la escritura? ¿Por qué?

La tabla 2 muestra que, según los resultados de la prueba de chi cuadrado ($p < .05$), las respuestas no se distribuyeron de manera uniforme, sino que se agruparon en un lado de la escala. La mayoría de los participantes se mostraron a favor de la WCF proporcionada por el profesor sobre aspectos relacionados con el contenido y lingüísticos, en particular la gramática, el vocabulario y la organización. Por el contrario, el 16,4 % de los estudiantes consideraron que los comentarios sobre el contenido/las ideas no eran valiosos.

Debido a las preocupaciones sobre la claridad del texto, los participantes se mostraron a favor de las correcciones tanto en los aspectos relacionados con el contenido como en los lingüísticos de la escritura. El encuestado 53 argumentó que «las correcciones son fundamentales para mejorar la redacción y la comprensión de un texto» (12 de enero de 2023). Además, el encuestado 136

comentó que «el objetivo es escribir con claridad y concisión, por lo que cualquier corrección nos ayuda a mejorar nuestra redacción» (13 de julio de 2023).

Otra razón para esta preferencia fue el deseo de alcanzar un dominio completo de la habilidad de escritura. El encuestado 11 reflexionó: «Es muy útil que los profesores nos den retroalimentación sobre todos nuestros errores, grandes o pequeños, para dominar el idioma y adquirir conocimientos más específicos que nos ayuden a escribir» (12 de enero de 2023). Del mismo modo, el encuestado 20 señaló: «Las correcciones en estos aspectos nos ayudan a dominar correctamente el inglés, ya que, al conocer los errores que cometemos, podemos mejorar» (12 de enero de 2023).

Por último, los participantes se opusieron a los comentarios sobre las ideas, ya que estas reflejan opiniones personales y, por lo tanto, no deben corregirse. El encuestado 162 afirmó: «No estoy muy de acuerdo con que se corrijan mis ideas, porque cada uno tiene su propia ideología y piensa de manera diferente» (20 de julio de 2023). El encuestado 08 se mostró de acuerdo diciendo: «Marcar los errores en nuestras ideas hará que no queramos participar con nuestro juicio u opinión sobre un tema» (12 de enero de 2023).

3.3. ¿Qué tipo de alcance de la WCF proporcionada por el profesor prefieren los estudiantes de inglés como lengua extranjera de nivel B1 en la escritura? ¿Por qué?

La tabla 3 indica que la mayoría de los encuestados preferían que se corrigieran todos sus errores,

Tabla 3. Preferencias de los estudiantes en cuanto al alcance de la WCF
Fuente: propia (2025)

Ámbito	N	%
El profesor debe corregir todos los errores	141	74.6
El profesor debe marcar todos los errores graves, pero no los leves.	14	7.41
El profesor debe corregir la mayoría de los errores graves, pero no necesariamente todos.	9	4.76
El profesor solo debe corregir algunos de los errores más importantes.	0	0
El profesor solo debe corregir los errores que interfieren en la comunicación de tus ideas.	21	11.11
El profesor no debe marcar ningún error y solo debe responder a las ideas y al contenido.	4	2.12

mientras que ninguno quería comentarios solo sobre algunos errores importantes. Los participantes preferían comentarios sobre todos los errores porque eso permite un aprendizaje personalizado. El encuestado 182 declaró: «Si recibo comentarios sobre todos mis errores, sabré exactamente qué tema debo repasar. Pero si solo se señalan algunos errores, seguiré haciendo un mal trabajo» (20 de julio de 2023). Del mismo modo, el encuestado 02 admitió: «Los profesores deberían señalar todos los errores de los estudiantes para que reciban comentarios, puedan corregirlos y vean dónde cometen más errores, para no volver a cometerlos» (12 de enero de 2023).

Además, los participantes se decantaron por una retroalimentación exhaustiva porque para ellos era importante alcanzar un dominio completo de la escritura. El encuestado 39 afirmó: «Los profesores deberían seleccionar todos los errores porque, en la escritura, tanto la estructura y la selección de ideas como la puntuación y la gramática son esenciales para un buen texto» (12 de enero de 2023). Además, el encuestado 20 destacó que «[la retroalimentación exhaustiva] ayuda a garantizar que no haya lagunas ni puntos ciegos en la adquisición de conocimientos» (12 de enero de 2023).

4. Discusión

En general, este estudio específico del contexto reveló tendencias claras en las estrategias de retroalimentación preferidas, que contrastan con Kim et al. (2020) y Mikulski et al. (2019). Esta diferencia puede deberse a que ellos incluyeron a participantes diferentes y el alcance del estudio fue más limitado. Los autores examinaron a estudiantes de coreano y español y se centraron únicamente en estrategias directas e indirectas con comentarios o indicaciones. Por el contrario, este trabajo contó exclusivamente con participantes de inglés como lengua extranjera y abordó una gama más amplia de estrategias. Por lo tanto, el contexto de la investigación puede haber influido en los resultados (Villavicencio, 2023).

Más concretamente, los participantes en este estudio se mostraron a favor de las estrategias de retroalimentación directa, en consonancia con Yaseen et al. (2024), y de la retroalimentación indirecta acompañada de códigos y localización de errores, en línea con Valentin-Rivera (2023) y Westmacott (2017). Los participantes consideraron que las estrategias eran guías de corrección claras y explicaron que limitarse a señalar los errores sin dar más indicaciones era inútil. Estos resultados pueden deberse a la naturaleza de las estrategias preferidas, que proporcionan detalles sobre lo que hay que corregir y, por lo tanto, evitan la confusión o la

incertidumbre de los estudiantes (Kawashima, 2023).

En cuanto a la retroalimentación directa, los participantes la percibieron como una guía que facilitaba la revisión de la retroalimentación, a diferencia de la mera señalización de errores, que no consideraban una retroalimentación genuina ni motivadora para el aprendizaje. A este respecto, Schultz (2001) destaca que los estudiantes ven a los profesores como fuentes de retroalimentación y explicación; por consiguiente, los estudiantes esperan que los instructores proporcionen correcciones que muestren claramente lo que han hecho mal. Además, en consonancia con Westmacott (2017), los encuestados indicaron que la retroalimentación indirecta a través de indicaciones de errores fomenta el aprendizaje autónomo. Dado que la estrategia no proporciona formas correctas, los estudiantes se involucran en procesos de reflexión para corregir las imprecisiones de forma independiente (Ellis, 2008). No obstante, la estrategia debe incluir indicaciones claras de los errores (Mikulski et al., 2019) en lugar de limitarse a marcarlos, ya que, según los participantes en el estudio, la falta de información correctiva puede causar confusión.

En cuanto a los objetivos, los participantes consideraron valiosa la WCF tanto lingüística

como relacionada con el contenido, de forma similar a Gedik Bal (2022) y Nurie (2020). Esto sugiere que los alumnos son conscientes de la importancia de ambos aspectos para convertirse en escritores competentes (Nguyen et al., 2021) y reconocen su interdependencia en la creación de textos eficaces. En este sentido, los encuestados expresaron su preferencia por recibir comentarios sobre ambos objetivos, ya que aspiraban a producir textos claros y alcanzar un dominio completo de la escritura.

En particular, los participantes se mostraron a favor de recibir comentarios sobre la gramática, el vocabulario y la organización, en contraste con Gonzalez-Torres (2023), quien identificó la gramática y el vocabulario como el enfoque principal de los estudiantes. Este énfasis en un objetivo sobre el otro podría reflejar los objetivos del aula; así, los profesores pueden hacer que los alumnos se centren en la precisión lingüística o en la claridad de las ideas (Mikulski et al., 2019; Reynolds y Zhang, 2022). En consecuencia, los resultados de este estudio pueden haber estado influenciados por las prácticas de evaluación en el aula del Instituto, que abarcaban parámetros de contenido y lingüísticos.

Un hallazgo notable de este estudio es que el 16,4 % de los participantes se opuso a los comentarios sobre el contenido o las ideas. Argumentaron que las ideas pertenecen a las opiniones personales, por lo que el WCF no debería abordarlas. Los encuestados parecen estar confundidos sobre a qué se refieren los comentarios sobre el contenido. No se trata de juzgar sus opiniones, sino de evaluarlas en cuanto a su claridad,

relevancia y desarrollo (Brown, 2004; Ruegg, 2015). Esta confusión podría haber llevado a los encuestados a expresar que «[la retroalimentación sobre el contenido] es la menos útil, ya que no está relacionada con la gramática inglesa» y «no siento que reciba retroalimentación cuando [los maestros] comentan mis ideas. Creo que mis ideas no tienen nada que ver con la gramática». El malentendido podría deberse a que los profesores no explican suficientemente en qué consiste la retroalimentación sobre el contenido (Lee, 2019) y a la escasa atención que se le presta durante la corrección (Lee, 2017). De hecho, la WCF se ha centrado tradicionalmente en los aspectos lingüísticos (Cárcamo, 2020).

Por último, en consonancia con Yaseen et al. (2024), los participantes prefirieron que la WCF cubriera todos los errores. Su objetivo es dominar las habilidades de escritura de forma integral y, por lo tanto, valoran las correcciones de los errores relacionados con el contenido y los errores lingüísticos. Esta preferencia puede derivarse de la naturaleza del alcance difuso, que aborda la precisión general, la buena redacción y la detección de defectos que los alumnos no pueden identificar (Nguyen et al., 2021). Además, los encuestados se mostraron a favor de la retroalimentación no enfocada por su potencial de aprendizaje personalizado. El aprendizaje personalizado consiste en adaptar la enseñanza a las necesidades y puntos fuertes de los alumnos (Bishop et al., 2019), y la retroalimentación integral puede centrarse en los errores reales de cada alumno, en contraste con la retroalimentación enfocada, que aborda errores específicos (Ellis et al., 2008), pasando por alto las necesidades individuales de los alumnos.

5. Conclusiones

Este estudio específico exploró las percepciones y preferencias de los estudiantes de inglés como lengua extranjera de nivel B1 con respecto a la retroalimentación sobre el trabajo escrito proporcionada por los profesores en términos de estrategias, objetivos y alcance en un instituto de idiomas universitario de Ecuador; por lo tanto,

los resultados de esta investigación se refieren a este caso concreto.

Los resultados revelan que los participantes valoran la retroalimentación directa y las estrategias indirectas que incluyen una fuente de información o indicaciones codificadas de la ubicación de

los errores para desarrollar las habilidades de escritura. Cuando la retroalimentación no contiene suficiente información correctiva, los participantes la consideran confusa e inútil. Por lo tanto, la retroalimentación sobre la escritura proporcionada por el profesor debe ser lo más clara y orientadora posible, de modo que los participantes reconozcan sus errores y comprendan las formas correctas. Los profesores pueden empezar a proporcionar retroalimentación directa cuando los alumnos no tienen la confianza o los conocimientos necesarios para realizar correcciones de forma independiente. Luego, cuando adquieren más competencia, se puede aplicar la retroalimentación indirecta para fomentar la reflexión y las habilidades de resolución de problemas en la corrección de errores. En última instancia, los procesos de enseñanza-aprendizaje deben aspirar al aprendizaje autónomo.

En segundo lugar, los participantes valoran la WCF en función de los errores lingüísticos y de contenido. Aunque prefieren que se aborden todos los errores, los profesores pueden decidir si esto es factible o dar prioridad a determinados tipos de errores en función de las necesidades de la clase. En cualquiera de los dos casos, los instructores deben comunicar qué aspectos se tratarán en los comentarios. Además, aunque la WCF puede centrarse en aspectos lingüísticos o de contenido, no debe concentrarse en uno solo a lo largo de todo el curso, ya que el otro aspecto puede percibirse como irrelevante en la

escritura. Los alumnos deben comprender que dominar la escritura implica no solo precisión lingüística, sino también de contenido, ya que ambos aspectos son interdependientes e influyen en la eficacia de los textos.

Del mismo modo, los profesores deben explicar claramente en qué consiste cada criterio de retroalimentación. Los participantes deben comprender que la retroalimentación sobre el contenido no consiste en juzgar sus opiniones personales, sino en evaluar la relevancia, la claridad y el desarrollo de sus ideas. En última instancia, deben saber que el objetivo de la retroalimentación es pulir las habilidades de escritura y no juzgar las opiniones personales.

Por último, los encuestados se muestran a favor de la retroalimentación no centrada por su característica de aprendizaje personalizado para lograr un dominio completo de la escritura. Dado que el objetivo del aula es abordar las necesidades lingüísticas de los estudiantes, la retroalimentación integral puede servir para este propósito, ya que corrige los errores reales de los alumnos y no los que parecen comunes en clase desde la perspectiva del maestro. En consecuencia, se abordan las imprecisiones lingüísticas y de contenido, lo que fomenta un desarrollo integral de las habilidades de escritura. No obstante, evaluar la escritura a través de un enfoque no específico puede llevar mucho tiempo debido a su naturaleza, por lo que se recomienda que los profesores alternen entre un enfoque específico y uno no específico.

6. Limitaciones y recomendaciones

Al igual que otros trabajos, este estudio reconoce sus limitaciones y ofrece recomendaciones. En primer lugar, esta investigación específica se llevó a cabo en un instituto de idiomas de una universidad pública, por lo que no es apropiado generalizar los resultados. Por lo tanto, sería útil escuchar las opiniones de los estudiantes sobre la WCF en otros contextos, como los estudiantes de inglés como lengua extranjera, los institutos, las escuelas primarias, las universidades e incluso los que aprenden otras lenguas extranjeras además del inglés.

Además, este estudio solo ofrece las opiniones de los participantes en el estudio. Por lo tanto, sigue siendo necesario comprender las percepciones de los profesores y examinar las prácticas de WCF para tener una visión más amplia de la situación de WCF en las clases de escritura. Los estudios posteriores pueden incluir una comparación entre las percepciones de los estudiantes y los profesores y las prácticas reales de WCF en el aula, o bien investigar únicamente las percepciones de los profesores y las prácticas en el aula.

Además, el debate sobre la WCF parece estar lejos de haberse zanjado en la bibliografía actual. Se sugiere realizar investigaciones adicionales, ya que las pruebas siguen siendo escasas, especialmente en América Latina. Del mismo modo, la WCF de los profesores requiere una investigación más profunda en Ecuador. Los estudios existentes son limitados en número y abordan la retroalimentación de forma general. Los estudios deberían centrarse de manera más específica en los entornos y el alcance, en lugar de estar abiertos a las percepciones de la retroalimentación sobre el aprendizaje de idiomas, como en Narváez y Verdezoto (2021). Los trabajos deberían abordar habilidades lingüísticas específicas, participantes y tipos, objetivos, estrategias y alcance de la retroalimentación.

Por último, cabe señalar que la mayoría de los estudios se centran en los objetivos o en las estrategias y el alcance de la retroalimentación, descuidando la interrelación entre ellos. Por lo tanto, las investigaciones futuras deberían examinar los tres elementos simultáneamente, como en este estudio. No deben tratarse por separado, ya que los profesores pueden tomar decisiones sobre la retroalimentación en cuanto a cómo, qué y cuánto corregir en función de las preferencias y percepciones de los alumnos. En última instancia, la enseñanza centrada en el alumno requiere que se tenga en cuenta la opinión de los alumnos en las decisiones de la clase.

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Information technology management and its impact on organizational innovation in Latin American universities: a narrative review

Gestión de tecnologías de información y su incidencia en la innovación organizacional universitaria latinoamericana: revisión narrativa

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Information technology management and its impact on organizational innovation in Latin American universities: a narrative review

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Resumen

Este estudio ofrece una revisión bibliográfica acerca de los marcos teóricos en la gestión de Tecnologías de la Información (TI), enfocándose particularmente en su vinculación con la innovación organizacional dentro del contexto específico de la administración estudiantil en Instituciones de Educación Superior (IES) latinoamericanas. Utilizando una metodología de revisión narrativa, se examinan modelos conceptuales relevantes, que proporcionan mecanismos robustos para estandarizar operaciones, optimizar procesos administrativos e impulsar la innovación, aunque su implementación en la región latinoamericana es dispar debido a limitaciones presupuestarias, insuficiente infraestructura tecnológica y resistencia organizacional al cambio. Los hallazgos destacan que la adaptación contextualizada, una gobernanza tecnológica integral y un abordaje estratégico interdisciplinario son esenciales para maximizar los beneficios en términos de innovación. Este análisis enfatiza que la integración exitosa de marcos de gestión de TI debe contemplar factores culturales, institucionales y tecnológicos, planteando un enfoque comprehensivo para orientar futuras implementaciones.

Palabras clave: gestión de TI, administración estudiantil, universidades, Latinoamérica, innovación organizacional.

Abstract

This study offers a bibliographic review of theoretical frameworks in Information Technology (IT) management, focusing particularly on their relationship with organizational innovation within the specific context of student administration in Latin American Higher Education Institutions (HEIs). Using a narrative review methodology, relevant conceptual models are examined. These provide robust mechanisms to standardize operations, optimize administrative processes, and drive innovation. However, their implementation in Latin America is uneven due to budgetary constraints, insufficient technological infrastructure, and organizational resistance to change. The findings highlight that contextualized adaptation, comprehensive technological governance, and an interdisciplinary strategic approach are essential to maximize benefits in terms of innovation. This analysis emphasizes that the successful integration of IT management frameworks must consider cultural, institutional, and technological factors, proposing a comprehensive approach to guide future implementations.

Keywords: IT management, student administration, universities, Latin America, organizational innovation.

1. Introduction

Digital transformation is redefining the functioning and administrative processes of higher education institutions (HEIs) worldwide, with Latin America a region susceptible to these changes. Latin American universities face growing pressure to modernize their administrative operations and improve the efficiency of student services through the use of information technology (IT) (Rodríguez Abitia & Bribiesca Correa, 2021). Despite this, many institutions in the region lag significantly behind in technology adoption, mainly due to budget constraints, insufficient leadership, cultural resistance to change, and unequal access to adequate technological infrastructure (Lustosa Rosario et al., 2021; Lucio-Nieto and González-Bañales, 2019).

Student administration, including enrollment, academic records, student services, and administrative procedures, has been particularly affected by these lags. Often, technology adoption has been fragmented, resulting in isolated and inefficient systems that do not interact properly (Mejía Bárcena et al., 2022). The COVID-19 pandemic further highlighted the need for robust digital infrastructure, accelerating the implementation of technological solutions in student procedures such as online registration, virtual records, and automated communication (Abdelilah et al., 2024).

In the face of these challenges, organizational innovation is a crucial response, understood as the institutional capacity to introduce significant changes in processes, services, and administrative models (Perilla Maluche et al., 2022). Proper IT management can act as a catalyst for this innovation, allowing for the automation of repetitive tasks, reduced response times, and the implementation of new student-centered service models, such as integrated platforms and data analytics (Terán-Guerrero, 2019). However, achieving true organizational innovation requires not only new technologies but also solid theoretical frameworks to guide their strategic implementation.

Various IT management frameworks and models have been proposed and applied in university contexts, the most relevant being: COBIT (Control Objectives for Information and Related Technologies), ITIL (Information Technology Infrastructure Library), ISO/IEC 20000 (IT Service Management), RBV (Resource-Based View), TAM (Technology Acceptance Model), TOE (Technology-Organization-Environment), and UTAUT (Unified Theory of Acceptance and Use of Technology).

COBIT, ITIL, and ISO/IEC 20000 offer frameworks for IT service governance and management that can improve administrative quality and foster a culture of continuous innovation through standardized processes and clear metrics (Khouja et al., 2018; Vengoechea Orozco & Vidal Tovar, 2018; Zambrano Peñaherrera & Páliz Osorio, 2020). RBV emphasizes that innovation in student administration depends on how universities internally manage their technological resources, human skills, and organizational knowledge (Riza et al., 2025; Zapata Rotundo, 2020). Technology adoption models such as TAM, TOE, and UTAUT offer complementary analyses of the factors that determine the acceptance and effective use of new technologies by students, teachers, and administrative staff, highlighting aspects such as perceived usefulness, ease of use, and organizational conditions necessary for successful implementation (Xue et al., 2024).

Despite the availability of these theoretical frameworks, the literature on their specific application in the student administration of Latin American HEIs remains limited. Most existing studies come from North American, European, or Asian contexts, leaving a significant gap in the regional literature (Khouja et al., 2018). This limits the knowledge available to Latin American university leaders, who require contextualized evidence to guide their technological and administrative strategies (Rodríguez, 2022). The present study addresses

this gap through a literature review, synthesizing available knowledge and providing a critical, comparative view of the current state in the Latin American region. This review will contribute to understanding how IT management frameworks can drive organizational innovation in specific contexts. In addition, it will provide valuable information for developing internal capacities and addressing frequent barriers to technology adoption, thereby strengthening student administration.

Based on the above, this article aims to characterize IT management frameworks and their relationship with organizational innovation in the context of student administration at Latin American HEIs. In addition to this introduction, the article includes a methodological section describing the approach and criteria used in the literature review, a results section summarizing the main findings, a critical discussion of the implications of these results in the regional context, and finally, a conclusion offering concrete recommendations and setting an agenda for future research.

2. Materials and methods

This research uses a narrative literature review design, which is appropriate for consolidating and synthesizing current knowledge on a topic from an expert perspective, offering a broad overview that highlights existing gaps for future research (Manterola et al., 2023). Narrative literature reviews are particularly relevant for analyzing complex topics that have been addressed across various disciplines and research traditions, enabling the mapping of a field of study, the synthesis of the state of knowledge, and the proposal of a research agenda (Snyder, 2019). The narrative approach selected facilitates a general understanding of the literature on a topic, synthesizing and interpreting the available findings without attempting a systematic or exhaustive search (Paré et al., 2014).

The search strategy aimed to obtain scientific sources relevant to the topic from recognized international databases (Scopus, IEEE Xplore, ERIC) and regional Latin American repositories (SciELO, RedALyC). This combination recognized the coverage of relevant global and regional literature. The key terms were combined using Boolean operators, using search strings such as: “information technology management” AND “organizational innovation” AND “higher education” AND “student administration.” The search was limited to the period between 2000

and 2025. This range was established because 2000 marks the beginning of the consolidation of the internet and digital transformation in the higher education sector, while 2025 allows for the capture of the most recent literature, ensuring a contemporary review of the field of study.

The inclusion criteria included peer-reviewed articles and book chapters that explore conceptual frameworks for IT management in university contexts, research on organizational innovation in HEIs, and studies with methodological rigor. Exclusion criteria included works that were not peer-reviewed, unrelated to educational contexts or innovation or IT management, and studies that lacked methodological rigor or full-text availability. The selection process was carried out in two successive phases: first, based on the initial search, a review of titles and abstracts resulted in the preselection of 105 articles; subsequently, a review of the full text was conducted, seeking a relevant selection based on the judgment of the researchers, which resulted in 50 selected articles that constitute the body of this narrative review.

A thematic-argumentative approach was used to synthesize the literature, a method that recognizes the active role of the researcher in interpreting the data (Braun & Clarke, 2006). This process involved analyzing each study to identify its

conceptual categories and central arguments. To consolidate the findings, the articles were grouped under three thematic axes that allowed for a cross-sectional interpretation: a) Governance and Standardization, which groups regulatory frameworks such as COBIT, ITIL, and ISO/IEC 20000 for operational efficiency; b) Strategic Capabilities, focusing on resource-based view (RBV) and institutional alignment; and c) Adoption and Human Factors, which integrates models such as TAM, TOE, and UTAUT to assess

cultural acceptance of change. The objective was not only to describe patterns but also to articulate a coherent narrative that contextualizes the various theoretical frameworks, highlights convergences, and highlights knowledge gaps in the field. To effectively manage the information, a bibliographic manager was used to organize references and thematically tag studies.

3. Results

3.1. Identified theoretical frameworks

The conceptual frameworks identified in the literature on IT management and its link to organizational innovation, specifically in the context of HEIs, are diverse and exhibit varying levels of applicability. Table 1 summarizes the most relevant ones, highlighting their focus and applicability.

3.2. Application in Latin American HEIs

In Latin America, universities have begun to implement IT management models, such as COBIT and ISO-based frameworks, albeit gradually. A study by RedCLARA provided a regional perspective on IT governance practices, noting that many universities were still in the early stages of formal IT governance (Gutiérrez et al., 2019).

- In Ecuador, the University of Cuenca conducted a governance assessment based on COBIT 2019, finding that its IT processes had reached a basic level of maturity. This assessment helped identify gaps and critical objectives aligned with the university's strategy (Padilla Verdugo & Saquicela Galarza, 2020). Similarly, the Laica Eloy Alfaro University of Manabí evaluated its IT processes

and found that none were formally managed, underscoring the nascent state of IT governance in some universities (Zambrano Vera & Molina Sabando, 2017).

- In Mexico, a study reported that most Mexican universities had not yet documented or shared success stories in IT management, nor had they established periodic benchmarking of IT governance practices or maturity assessments (Franco Reboreda & Salvador Vallés, 2017). In addition, another TAM-based study at the Autonomous University of Tamaulipas examined how national culture and end-user profiles impact the use of technology in university communities (Yong Varela et al., 2010).
- In Colombia, initiatives such as the PAGTI project have proposed adapting the IT governance framework of Spanish universities, known as GTI4U, aligned with the principles of ISO 38500 (IT Governance) for local use (Vivas Martín et al., 2022). In Peru, a tailor-made IT governance reference model for universities (GTIUP) was conceptually developed (Yrigoyen-Quintanilla, 2016). At the Federal University of Juiz de Fora (UFJF) in Brazil, the IT department of the university hospital provided ad

Table 1. Comparative summary of the main theoretical frameworks identified, highlighting their primary focus, key concepts, relevance, challenges, and requirements for their adoption in HEIs.

Source: Prepared by the authors.

Theoretical Framework	Main Focus	Key Concepts	Relevance in HEIs	Limitations and Challenges	Requirements for Success
COBIT 2019 (Control Objectives for Information and Related Technology)	Strategic IT governance and management	Governance System, Design Factors, Cascade of Goals (ISACA, 2018).	Designs flexible governance by prioritizing educational objectives (De Haes et al., 2020).	High complexity: May be bureaucratic for small universities. Requires prior institutional maturity (Mahecha Aponte and Nandar Martínez, 2023).	Commitment from senior management and formalized governance committee structure (Padilla Verdugo and Saquicela Galarza, 2020).
ITIL 4 (Information Technology Infrastructure Library)	Joint creation of value and service management	Service Value System, Value Chain, Four Dimensions, Guiding Principles (AXELOS, 2020).	Professionalizes IT service delivery, improves efficiency and user satisfaction (Corrêa and Méxas, 2018).	Cultural resistance: Change of mindset towards services (Lucio-Nieto and González-Bañales, 2019).	Certified IT staff, Service Desk tools (Vengoechea Orozco and Vidal Tovar, 2018).
ISO/IEC 20000-1:2018 (IT Service Management)	Requirements for a Service Management System.	Organizational context, leadership, planning, support, and operation of the service portfolio (ISO/IEC, 2018)	Provides a certifiable international standard that guarantees service quality (Cots et al., 2016).	Cultural resistance: Perceived as rigid. Requires exhaustive documentation (Lucio-Nieto and González-Bañales, 2019).	Process-oriented culture (Lucio-Nieto and González-Bañales, 2019)..
RBV (Resource-Based View) and Dynamic Capabilities	Advantage based on resources and the ability to reconfigure them in changing environments.	VRIN resources (Valuable, Rare, Inimitable), Dynamic Capabilities (Teece, 2018).	Drives innovation by developing unique competencies (Vasudevan, 2021).	Difficulty of measurement: Complexity in quantifying intangible assets and tacit knowledge (Leih and Teece, 2016).	Internal audit of capabilities and promotion of specialized human capital (Leih and Teece, 2016).
TAM / UTAUT 2 (Technology Acceptance Model / Extended Unified Theory of Acceptance and Use of Technology)	User acceptance and use of technology.	Performance expectancy, effort, social influence, hedonic motivation, price, and habit (Venkatesh et al., 2012).	Evaluates the implementation of new technologies, ensuring their effective adoption (Ayaz and Yanartaş, 2020).	Subjectivity: User perception, which may vary due to emotional or cultural factors, not technical ones (Silvestre et al., 2022).	Conducting pilots, ongoing surveys, and change management programs (Xue et al., 2024).
TOE (Technology-Organization-Environment)	Technology adoption considering the full context	Technological, organizational, and environmental factors (Baker, 2012).	Comprehensive assessment of institutional readiness before adopting new technologies (Gangwar et al., 2015).	Scope: May lose focus on specific problems in university technological infrastructure (Saint and Gutierrez, 2017).	Analysis of the regulatory environment and regional technological competition (Saint and Gutierrez, 2017).

hoc, reactive IT support, resulting in dissatisfied users (Corrêa & Méxas, 2018). UFJF addressed this problem by implementing a successful Service Desk and Incident Management process aligned with ITIL.

- In the Dominican Republic, a study validated an extended TAM model with 1,260 university students to examine their intention to use a virtual classroom platform during the transition to online education prompted by the COVID-19 pandemic (Silvestre et al., 2022). Other universities in the region have launched Service Management Offices or ITIL training initiatives to professionalize their campus IT services, although difficulties

in maintaining these efforts have been observed (Lucio-Nieto and González-Bañales, 2019).

These examples show that Latin American HEIs are aware of global IT governance frameworks and, in some cases, have designed local models; however, the actual implementation of governance processes has been slow and uneven across the region.

3.3. Link between IT management and organizational innovation

Frameworks such as COBIT enable strategic IT alignment through integrated planning with institutional objectives,

promoting innovative initiatives such as virtual campuses and integrated academic management systems (Padilla Verdugo & Saquicela Galarza, 2020). Also, the use of frameworks such as ITIL has yielded positive results in operational efficiency and user satisfaction by introducing processes that enable practical innovations, ranging from service automation to predictive analytics in student administration (Hochstein & Brenner, 2006). Furthermore, the effective adoption of technology depends on end-user acceptance, underscoring the importance of user-centered models such as TAM and UTAUT (Zheng et al., 2025).

Organizational innovation, understood as the introduction of new combinations of productive factors that reconfigure the competitive environment (Schumpeter, 2002), increasingly depends on agile IT management. However, the relationship between implementing IT management frameworks and the capacity to innovate is not direct; it is mediated by the development of key institutional capabilities, as outlined in Figure 1.

The drivers in Figure 1, consisting of IT management frameworks, do not generate innovation on their own, but act as catalysts to enable a set of mediating institutional capabilities, such as strategic alignment between technology and mission objectives, operational efficiency through standardized processes, optimal risk management, and user acceptance of technology. Together,

these capabilities foster the flexibility and scalability necessary for the educational institution to experiment with new solutions and adapt quickly to emerging challenges (Perilla Maluche et al., 2022).

Mature technology governance and the mediation of enabled capabilities translate into greater agility in executing digital transformation and process automation projects. Likewise, the ability to manage data efficiently and securely enables data-driven decision-making and allows for continuous improvement in the user experience, thus closing the cycle that begins with IT management, continues with the enabling of institutional capabilities, until a tangible impact of innovation occurs (Hidayat et al., 2025; Marlina & Lawita, 2024).

When analyzing this model in the Latin American context, a tension can be observed in the mediators block. While operational efficiency is often achieved through automation, strategic alignment and risk management appear to be weakened in the region (Gutiérrez et al., 2019). This suggests that, although HEIs acquire technology (drivers), they fail to develop the organizational capabilities (mediators) necessary for disruptive innovation. Specifically in student administration, the capacity for technological adoption is the most important predictor of success, as resistance to change among administrative staff often blocks modernization initiatives, regardless of the quality of the software implemented (Abdelilah et al., 2024).

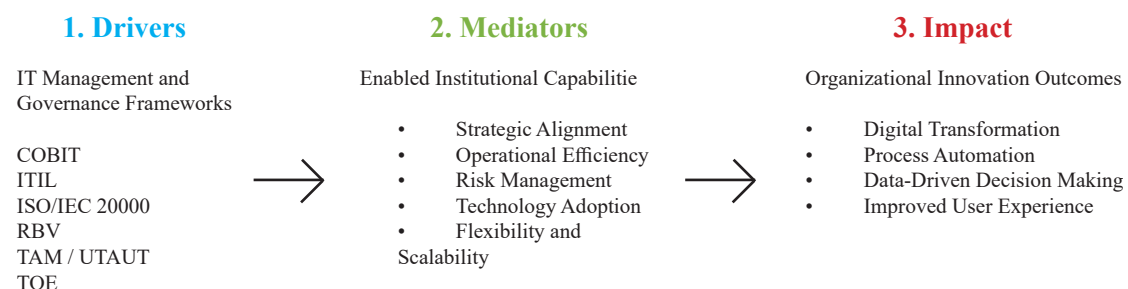


Figure 1. Conceptual model illustrating the relationship between IT management frameworks, the institutional capabilities they enable, and the results of organizational innovation in higher education
Source: Own elaboration.

4. Discussion

4.1. Relevance of theoretical frameworks in Latin American HEIs

A review of theoretical frameworks for IT management shows heterogeneous and uneven adoption across Latin American HEIs, encompassing both international best-practice frameworks (ITIL, COBIT, ISO/IEC 20000) and theoretical academic approaches (RBV, TAM, TOE, UTAUT). These frameworks have significant potential benefits, although their effective adoption faces particular structural and cultural challenges in the regional context. This situation often leads to partial adoption or the development of hybrid or adapted models, such as GTI4U, explicitly designed for regional contexts (Llorens Largo & Valverde Alulema, 2016; Sengik et al., 2022).

Frameworks such as ITIL and ISO/IEC 20000 aim to standardize processes, increase operational efficiency, and ensure strategic alignment between IT and institutional objectives. However, Latin American HEIs show limited adoption due to inherent complexity and a lack of specialized human resources (Lucio-Nieto and González-Bañales, 2019). Local adaptation, prioritizing processes such as student incident management, is important for these frameworks to generate tangible value. COBIT, with its emphasis on strategic governance, emerges as a robust framework that aligns IT investments with the educational mission and enhances risk management. Successful cases in Colombia point to improvements in operational efficiency and competitiveness, although their comprehensive adoption requires prior organizational maturity and sustained support from institutional leadership (Mahecha Aponte & Nandar Martínez, 2023).

From a strategic perspective, RBV highlights the importance of developing exceptional internal resources and a capacity for continuous adaptation to technological and contextual changes (Teece, 2018; Vasudevan, 2021). However, in Latin

America, limited budgets and human resources mean efforts must focus on existing intangible assets and on strengthening external alliances. Evidence suggests that the internal development of digital capabilities and organizational flexibility is crucial to enabling sustainable innovations (Sofyani et al., 2023). Models such as TAM, TOE, and UTAUT address the challenge of technology adoption by considering human, organizational, and contextual factors. These models emphasize that even technologically advanced solutions fail if the end user's perception (ease of use and perceived usefulness) and the organizational and environmental context are not considered (Alomary & Woollard, 2015; Hidayat et al., 2025). The combination of these approaches is recommended to effectively manage innovation in Latin American educational environments, integrating training, adequate infrastructure, and consistent governance.

From a critical standpoint, it has been identified that the application of regulatory frameworks such as COBIT in Latin America often suffers from institutional isomorphism, where universities adopt the bureaucratic forms of the framework without internalizing its governance principles. Evidence suggests that the most robust frameworks for the region are not purist ones but rather hybrid, scalable models (Zambrano Vera & Molina Sabando, 2017). A strict ITIL approach, for example, can stifle the agility needed in HEIs with limited resources; therefore, the selective adaptation of key processes (such as incident and change management) is more effective than comprehensive implementations that ignore the local organizational culture.

4.2. Comparison with international experiences

Compared with international experiences, the literature indicates greater maturity in the implementation of frameworks in European, North American, and Asian universities, facilitated by environments with advanced

technological infrastructure, strong leadership, and supportive government policies (Khouja et al., 2018; Bianchi et al., 2021). In Europe and North America, for example, the adoption of ITIL and COBIT has led to significant improvements in service quality, user satisfaction, and strategic alignment, promoting innovative and agile environments (Galanek et al., 2018; Bianchi & Sousa, 2016). Asia presents a diverse landscape, with significant adaptations of international frameworks combined with local practices, highlighting successful cases in Malaysia and Indonesia, where strong institutional leadership and favorable public policies have driven these adaptations (Saleh & Almsafir, 2013; Andri et al., 2019).

In contrast, Latin America faces more pronounced challenges, such as limited budgets, frequent management turnover, and more rigid, hierarchical organizational cultures, making it difficult to directly transfer these international practices (Cadena Vela et al., 2021). The literature emphasizes that effective transfer of these frameworks requires careful calibration to local context, considering technological infrastructure, cultural factors, and government policies, to achieve benefits such as greater operational efficiency, transparency, and improved user experience (Zheng et al., 2025).

4.3. Practical implications for Latin American HEIs

The study's findings suggest several concrete practical implications for Latin American HEIs. First, the successful adoption of these frameworks involves strengthening technological governance, formalizing structures such as IT committees, and integrating the participation of academic and administrative leaders to ensure alignment and institutional support (Bianchi et al., 2021).

Second, a gradual approach is recommended, prioritizing critical processes to deliver rapid results and build institutional credibility. At the same time, effective change management campaigns mitigate resistance and foster an

innovation-oriented organizational culture (Lucio-Nieto and González-Bañales, 2019). Also, continuous staff and end-user training is essential to address knowledge gaps and ensure effective adoption (Marangunić & Granić, 2015). Third, it is proposed to integrate agile approaches with traditional frameworks to accelerate results and to manage institutional data as a strategic asset actively, promoting data analytics for informed decision-making (Gangwar et al., 2015).

4.4 Structural and operational challenges

Despite the potential of the frameworks analyzed, multiple challenges hinder their practical implementation in Latin America. Budget constraints, limitations in technological infrastructure, technical skills deficits, and weaknesses in governance constitute significant barriers (Cadena Vela et al., 2021). Resistance to change and rigid organizational cultures are also obstacles, highlighting the need for robust change management strategies and consistent institutional leadership to ensure continuity and strategic alignment (Abdelilah et al., 2024). To overcome these challenges, strategies such as inter-institutional partnerships for resource sharing, external financing, and progressive upgrading of technological infrastructure are recommended.

A significant gap in the reviewed literature is the lack of metrics that directly link IT management to academic quality. While administrative efficiency is measured, the current literature documents only scantily how these frameworks impact student retention or academic success (Sofyani et al., 2023). Furthermore, an unresolved tension exists between the need for standardization (driven by COBIT/ISO) and the flexibility required for agile innovation; the current literature offers no clear roadmap for balancing these forces in universities with low digital maturity. Latin American HEIs face the challenge of modernizing legacy systems while managing deep-rooted resistance to change, a dynamic that imported theoretical frameworks do not adequately address.

4.5 Projections and future lines of research

Several areas for future research have been identified, which will allow for the construction of robust and applicable knowledge that will facilitate the path toward effective IT management that promotes innovation in Latin American HEIs:

- Longitudinal empirical studies that measure the sustained impact of frameworks such as COBIT or ITIL on organizational innovation.
- Comparative research between countries and subregions within Latin America to

identify contextual factors that determine success or failure.

- Design of a Simplified IT Governance Framework for Latin American HEIs, integrating agile practices with regulatory controls, adapted to the budgetary volatility of the region.
- Quantitative studies that correlate the adoption of frameworks with specific metrics of innovation and institutional performance
- Research on the role of Artificial Intelligence as a tool to automate IT governance, reducing the bureaucratic burden that currently slows innovation in the region.

5. Conclusions

This narrative review concludes that integrating frameworks such as COBIT, ITIL, and UTAUT has transformative potential for Latin American HEIs. However, their effectiveness is conditioned by contextual factors that are often underestimated. It is not simply a matter of technological updating, but of cultural reengineering. The findings confirm that IT management acts as a catalyst that, only when mediated by solid institutional capabilities (alignment, efficiency, and acceptance), manages to impact organizational innovation.

The review of these theoretical frameworks highlights their practical and theoretical relevance, emphasizing that IT management is not only a technical issue but also a strategic and cultural one, and that it must be addressed through comprehensive approaches that recognize organizational diversity. Likewise, the value of IT management frameworks does not lie in their mere implementation but in their ability to build bridges between organizational competencies that drive innovation.

For researchers in Latin American HEIs, it is recommended to abandon “Big Bang” approaches.

It is preferable to implement governance pilots (e.g., Service Desk with ITIL) that demonstrate immediate value to students before scaling up to the entire organization. Furthermore, before adopting a complex framework such as COBIT, it is imperative to conduct digital maturity assessments to avoid failed implementations due to a lack of operational grounding. It is also recommended to integrate TAM/UTAUT model metrics into IT management KPIs. Technology should not be measured solely by its technical availability, but also by its adoption rate and perceived usefulness by the university community.

For university leaders, it is recommended to establish hybrid IT committees (academic-administrative) that ensure strategic alignment without bureaucratizing decision-making, and to invest in the digital literacy of administrative staff, which is more profitable for innovation than hardware upgrades, given that cultural resistance is the main barrier detected.

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La inclusión de la interculturalidad en la formación docente: una percepción de los estudiantes de educación superior

The inclusion of interculturality in teacher education: a perception of Higher Education Students

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La inclusión de la interculturalidad en la formación docente: una percepción de los estudiantes de educación superior

The inclusion of interculturality in teacher education: a perception of Higher Education Students

Abstract

This paper analyses the perception of university students on the integration of interculturality in teacher training programmes at the National University of Education (UNAE) in Ecuador. A mixed methodology was used, combining qualitative and quantitative approaches through a structured questionnaire applied to 589 students. The instrument evaluated the perception of the knowledge imparted by teachers in terms of the construction of the intercultural concept and practices. The answers given by the participants were analysed through Pearson's Correlation and grounded theory. The results show a positive correlation between the understanding of cultural diversity and student practices with a value of 0.706. Furthermore, when correlating the specific concepts of interculturality as a space for the exchange of knowledge and the multiplicity of cultures, questions P5 and P6 showed values of 0.608 and 0.635. In conclusion, teacher training in interculturality is relevant in the training of students, allowing them to broaden their knowledge of cultural diversity and the creation of spaces for inclusion through respect and tolerance.

Keywords: higher education, multicultural education, intercultural knowledge, cultural diversity, intercultural practices.

Resumen

Este artículo analiza la percepción de los estudiantes universitarios sobre la integración de la interculturalidad en los programas de formación docente de la Universidad Nacional de Educación (UNAE) del Ecuador. Se utilizó una metodología mixta, combinando enfoques cualitativos y cuantitativos a través de un cuestionario estructurado aplicado a 589 estudiantes. El instrumento evaluó la percepción de los conocimientos impartidos por los docentes en términos de la construcción del concepto y las prácticas interculturales. Las respuestas dadas por los participantes fueron analizadas mediante la Correlación de Pearson y la teoría fundamentada. Los resultados muestran una correlación positiva entre la comprensión de la diversidad cultural y las prácticas estudiantiles con un valor de 0,706. Además, al correlacionar los conceptos específicos de interculturalidad como espacio de intercambio de conocimientos y multiplicidad de culturas, las preguntas P5 y P6 arrojaron valores de 0,608 y 0,635. En conclusión, la formación docente en interculturalidad es relevante en la formación de los estudiantes, permitiéndoles ampliar sus conocimientos sobre la diversidad cultural y la creación de espacios de inclusión a través del respeto y la tolerancia.

Palabras clave: Conocimientos interculturales, diversidad cultural, educación multicultural, educación superior, prácticas interculturales.

1. Introducción

Debido al fenómeno de la globalización que está experimentando el mundo actualmente, se ha previsto la interacción entre personas de diferentes orígenes culturales, tal y como mencionan Manente et al. (2024), es necesario que la población globalizada fomente las competencias interculturales basadas en el respeto y el diálogo hacia los demás, lo que evitaría en gran medida los fenómenos discriminatorios. Íñiguez et al. (2021) y Arismendi (2021) expresan que los espacios educativos se tratarían como modelos interculturales que ayudarían a gestionar la diversidad de etnias y razas que existen en todo el mundo, promoviendo así el pensamiento crítico y la integración social en un contexto de pluralidad cultural.

Ecuador se caracteriza por ser un país multicultural con una variedad de grupos étnicos distribuidos en todas las provincias, entre los que se incluyen indígenas, mestizos, negros y blancos, entre otros; por esta razón, se considera relevante preservar cada uno de ellos, priorizando la legitimación de la no discriminación por motivos de raza, color de piel o cultura, tal y como menciona la Asamblea Constituyente de Ecuador (2008) en su artículo 1 «Ecuador es un Estado constitucional de derechos y justicia, caracterizado como social, democrático, soberano, independiente, unitario, intercultural, plurinacional y laico».

La interculturalidad es entendida por Dávila y Pinos (2019), y González et al. (2021), como la construcción de relaciones equitativas entre individuos, grupos étnicos y culturas; esto implica incorporar estos principios en todo el sistema educativo. Esto conduce a un sistema educativo que no solo es capaz de reconocer las diferencias, sino también de valorarlas e integrarlas en los procesos pedagógicos, fomentando un entorno inclusivo de respeto e igualdad (Leiva y Bracons, 2019; Dávila y Pinos, 2019).

Al analizar la perspectiva de la formación docente intercultural, se destaca que se trata de una necesidad cada vez más emergente y, por lo tanto,

es esencial que su formación académica se centre en abordar, reconocer y legitimar los diversos orígenes de sus estudiantes con el fin de mejorar la calidad de la enseñanza mediante la creación de centros de formación inclusivos (Alonso, 2019). En este sentido, Podestá et al. (2022) sostienen que un modelo de educación intercultural constituye un marco adecuado para abordar la diversidad cultural presente en las naciones, ya que no solo es un objetivo gubernamental, sino también una de las prioridades clave establecidas en la Agenda Política Global.

La educación intercultural promueve una educación de calidad basada en un sentido de pertenencia cultural y lingüística acorde con las necesidades de los pueblos y las nacionalidades (Flores, 2023; Escobar y Carcausto, 2022). Su institucionalización se produjo a finales de la década de 1980, gracias a la lucha de los pueblos indígenas que abogaban por su inclusión en los sistemas educativos y la escolarización de sus comunidades, teniendo en cuenta que muchos de sus miembros recibían una educación clandestina sin el apoyo del gobierno. Al analizar este caso concreto a través de la jurisdicción intercultural bilingüe, se obtuvieron importantes resultados con respecto a la estructura y la forma de gestión de la época (Villagómez, 2019).

Uno de estos resultados fueron las políticas y prácticas que los maestros debían tener para formar parte del sistema de educación intercultural bilingüe (EIB), ya que no solo se reconocía la necesidad de contar con profesionales nativos de sus comunidades, sino que también debían respaldar su formación docente considerando los contextos educativos como sujetos y sus necesidades en función de las culturas y etnias de las que provenían: temas y sus necesidades según las culturas y etnias de las que procedían, es decir, los aspirantes a maestros debían considerar que su objetivo educativo no solo se centraría en los estudiantes hispanohablantes convencionales (Villagómez, 2019).

Con el fin de incluir a los miembros de comunidades cuyas características socioculturales eran diferentes a las del resto de la población ecuatoriana, se crearon las escuelas indígenas de Cayambe, el Instituto Lingüístico de Verano, la Misión Andina y las Escuelas Radiofónicas Populares del Ecuador, entre otras (Flores, 2023). Un análisis de la legislación actual revela cambios significativos en lo que respecta al desarrollo intercultural, tal y como se describe en el artículo 347.9 de la Constitución de la República del Ecuador: «El Estado es responsable de garantizar un sistema de Educación Intercultural Bilingüe, en el que se utilizará la lengua de la respectiva nacionalidad como lengua principal de la educación» (Asamblea Constituyente de Ecuador, 2008).

En 2011, Ecuador adoptó un sistema de educación intercultural, bajo la supervisión de la Secretaría de Educación, de conformidad con la Ley Orgánica de Educación Intercultural. Su objetivo es posicionar la educación como un medio para promover la convivencia armoniosa entre los pueblos plurinacionales y democráticos del territorio. También es una estrategia gubernamental para fortalecer la identidad nacional, reconociendo y valorando la diversidad cultural y su enfoque multiverso (Sánchez y Manresa, 2022).

Como él señala, la formación del profesorado en cuestiones interculturales debe orientarse hacia el desarrollo de competencias tales como: a) fortalecer actitudes proactivas que respeten la diversidad cultural, b) fomentar el diálogo, c) evitar y controlar situaciones adversas que generen conflictos entre personas de diferentes grupos étnicos, razas o nacionalidades, d) comprender el significado de la cultura y cómo influye en la visión e interpretación de la realidad (Peñalva y Leiva, 2019). Sin embargo, la situación en las instituciones educativas suele ser contraria a lo anterior, como mencionan Pavez et al., (2023) en el censo de 1754 docentes que impartían conocimientos a estudiantes de origen migrante e indígena en la Municipalidad de Santiago de Chile por las instituciones Edu Global y Fundación Interhumanos.

Los resultados del estudio mostraron que es necesario fortalecer el sistema educativo para que sea más inclusivo; además, según el censo, se determinó que los maestros deben recibir formación intercultural, ya que solo «el 85.1 % aplicaba habilidades sociales genéricas, como una buena gestión del aula, mientras que el 58.4 % solo tenía habilidades sociales» (Pavez et al., 2023, p. 9). En cuanto a su formación, el 53,8 % afirmó tener los conocimientos y habilidades necesarios para orientar a los alumnos con las mismas costumbres y culturas, y solo el 23,9 % tenía formación profesional que pudiera ayudarle a comprender las necesidades de los alumnos migrantes. Por último, expresaron varios problemas que afectan a la educación intercultural, como que el 79.2 % informó que necesitaba formación sobre cuestiones relacionadas con la migración, la discriminación y los derechos humanos; el 78.8 % indicó la necesidad de orientación pedagógica para adaptar el plan de estudios; y el 74.6 % afirmó que necesitaba estrategias para implementar la educación antirracista (Edu Global y Fundación Interhumanos, 2018).

En el estudio de Aguavil y Andino (2018) se analizaron las deficiencias de los maestros interculturales y bilingües en varias instituciones educativas ubicadas en la provincia de Santo Domingo de los Tsáchilas mediante encuestas y análisis estadísticos. Los resultados indicaron que el 34,48 % de los docentes posee un título de segundo nivel, el 58,62 % posee un título de tercer nivel y solo el 6,90 % ha obtenido un título de cuarto nivel. La representación de maestros con un título de licenciatura se debe a la ubicación remota de las instituciones educativas y al dominio de las lenguas maternas por parte de las comunidades, como el tsá'fiki, por lo que los maestros de origen mestizo no tienen la capacidad de dominar este idioma, lo que dificulta el proceso de enseñanza. Cuando analizamos su formación en cuestiones interculturales, observamos un panorama más alentador, ya que el 86. El 21 % de los encuestados afirma tener estudios relacionados con la materia y se destaca que el 93,10 % de ellos recibe formación continua, pero el 37,93 % conoce el Modelo del Sistema

de Educación Intercultural Bilingüe (Aguavil y Andino, 2018).

En este contexto, la formación docente desde una perspectiva intercultural constituye un pilar fundamental para garantizar una educación inclusiva y equitativa en sociedades caracterizadas por la diversidad cultural (Peñalva y Leiva, 2019; Aguavil y Andino, 2018). Por ello, va más allá de la mera coexistencia de diferentes culturas en el ámbito educativo, promoviendo en su lugar el diálogo, la interacción y el reconocimiento mutuo como principios pedagógicos esenciales. Así, incorporar la interculturalidad en la formación docente implica desarrollar competencias que permitan a los educadores comprender las diferencias culturales, adaptar las estrategias de enseñanza y crear entornos de aprendizaje respetuosos y participativos. De esta manera, la práctica docente se convierte en un espacio de construcción social donde se valora el conocimiento local y se fomenta la ciudadanía crítica, contribuyendo a la transformación de modelos educativos que históricamente han invisibilizado las identidades y cosmovisiones diversas.

Una vez conocido el panorama de la importancia de la interculturalidad en la formación docente, se destaca que la educación intercultural es la base que promueve la mejora de las técnicas de aprendizaje enfocadas en el rescate de los valores ancestrales y la identidad de los pueblos, grupos étnicos y nacionales del territorio ecuatoriano (Sarmiento y García, 2021). De acuerdo con el artículo 57, párrafo 14, de la Constitución del Ecuador, se exige «desarrollar, fortalecer y mejorar el sistema de educación intercultural bilingüe con estándares de calidad, desde la estimulación temprana hasta la educación superior, de acuerdo con la diversidad cultural, con el fin de salvaguardar y preservar las identidades en consonancia con sus metodologías de enseñanza y aprendizaje» (Asamblea Constituyente del Ecuador, 2008).

El estudio sobre la inclusión de la interculturalidad en la formación docente se justifica por la necesidad de que los educadores actuales y futuros cuenten con la preparación necesaria para enseñar en contextos diversos, considerando la

interculturalidad de los pueblos que, aunque ha sido reconocida en las políticas educativas, su implementación práctica y la percepción de los estudiantes universitarios sobre su inclusión en los programas de formación docente son áreas poco exploradas. Comprender cómo perciben los estudiantes la integración de la interculturalidad en su formación contribuirá a mejorar la calidad de la enseñanza, promoviendo una educación inclusiva.

Para analizar el estudio, se ha planteado una hipótesis basada en las respuestas de los estudiantes sobre los conocimientos impartidos por sus profesores que reflejan su profesionalidad en cuestiones interculturales. H1 «La percepción de los estudiantes sobre la inclusión de la interculturalidad en la formación docente está relacionada con su nivel de conocimiento sobre la diversidad cultural y las prácticas pedagógicas inclusivas» se justifica en que aquellos estudiantes que tienen más conocimientos sobre la diversidad cultural y las prácticas pedagógicas inclusivas tienen una mejor percepción de la interculturalidad en la formación docente.

Este estudio adopta una postura crítica de interculturalidad, entendida como un proyecto político, epistémico y ético que va más allá de la mera coexistencia cultural para cuestionar las estructuras de poder que sostienen la colonialidad y el eurocentrismo. Según Walsh (2010), esta perspectiva implica concebir la educación como un acto pedagógico-político destinado a la transformación social y a la refundación de las estructuras que reproducen las desigualdades. Fornet-Betancourt (2004) sostiene que el diálogo intercultural debe ser simétrico, lo que requiere reconocer las condiciones históricas de dominación y abrirse a la diversidad epistémica del Sur Global. En la misma línea, Tubino (2015) advierte que la interculturalidad no puede reducirse a políticas funcionales al sistema, sino que debe promover procesos de descolonización y justicia social. Dietz (2012) complementa esta visión al enfatizar la necesidad de incorporar el conocimiento local y las prácticas comunitarias en la construcción de sociedades plurales. En conjunto, estas propuestas conforman una interculturalidad crítica que no solo reconoce la diferencia, sino que la convierte en la base para

la transformación estructural y la creación de nuevos órdenes sociales.

El presente estudio se centra en analizar las percepciones de los estudiantes universitarios sobre la inclusión de la interculturalidad en

los programas de formación docente. Este enfoque permite comprender cómo los futuros profesionales de la educación valoran la incorporación de contenidos y perspectivas interculturales en su preparación académica.

2. Materiales y métodos

La estrategia metodológica empleada en esta investigación fue un enfoque cuantitativo destinado a analizar las opiniones de los estudiantes universitarios sobre la inclusión de la interculturalidad en los programas de formación docente. A través del análisis documental, se revisaron documentos oficiales como políticas públicas (Constitución del Ecuador, Ley Orgánica de Educación Superior, Modelo del Sistema Educativo Intercultural Bilingüe) y leyes para ofrecer una visión general de los avances logrados en la implementación de la interculturalidad de acuerdo con el marco normativo; además, se consideraron investigaciones y estudios previos para comprender las experiencias de docentes y estudiantes con respecto al manejo del tema.

La Universidad Nacional de Educación (UNAE) es una institución pública ecuatoriana creada en 2013 con el propósito de transformar la formación docente a través de un modelo pedagógico inclusivo, crítico e intercultural. Ubicada en Azogues, en la provincia de Cañar, la UNAE se dedica a preparar profesionales comprometidos con la equidad, la diversidad cultural y la innovación educativa, integrando conocimientos locales y globales en sus programas de licenciatura, posgrado y educación continua.

Según Guevara (2019), el análisis documental es un proceso de sistematización del conocimiento a partir de diversas fuentes de información cuyo propósito es servir de base conceptual de apoyo a la investigación, permitiendo la interpretación, clasificación y organización de los datos. Con el fin de determinar cómo perciben los

estudiantes de educación superior la inclusión de la interculturalidad en la formación docente, se empleó un enfoque cuantitativo mediante un análisis estadístico con SPSS que nos permitió examinar las percepciones de los estudiantes en relación con lo que se dice y las prácticas de interculturalidad.

Como sostiene Sánchez (2019), la investigación cuantitativa nos permite analizar fenómenos medibles a través de estadísticas con el fin de describir, explicar y controlar las causas por las que se producen. El método estadístico permitió analizar la información recopilada mediante la técnica del cuestionario. Del mismo modo, el enfoque de la investigación fue de naturaleza transversal, ya que los datos se recopilaron de los estudiantes en un único momento, entre el 9 y el 31 de julio de 2024.

2.1. Participantes

En el presente estudio se consideró una población de 4561 estudiantes, pertenecientes a las áreas de Educación Básica, Educación Inicial, Educación Especial, Pedagogía de Lenguas Nacionales y Extranjeras, Pedagogía de Artes y Humanidades, Educación en Ciencias Experimentales y Educación Intercultural Bilingüe de la Universidad Nacional de Educación, UNAE, ubicada en la provincia de Cañar-Ecuador.

Para la estimación de la muestra se empleó un diseño estratificado, en el que se subdividió la población en estratos homogéneos que compartían características similares, como el género, la edad y el programa académico (Puente

et al., 2017). Se incluyó a todos los estudiantes matriculados en el programa de Educación Intercultural Bilingüe durante el período SI2024, tras obtener su consentimiento informado. En el caso de los demás programas, se seleccionó una muestra representativa de participantes mediante muestreo proporcional, con un total de 589 estudiantes. Este procedimiento garantizó la representatividad de los diferentes grupos y la validez estadística del estudio.

2.2. Instrumento

El cuestionario se elaboró a partir de una revisión sistemática de 120 artículos publicados en los últimos cinco años, seleccionados según criterios de relevancia y calidad científica en bases de datos indexadas como Scopus. De este conjunto, se identificaron diez estudios como referencias principales, de los que se extrajeron y adaptaron diversos elementos metodológicos y conceptuales para alinearlos con los objetivos específicos del estudio, garantizando así el rigor y la relevancia en el diseño del instrumento.

La escala de respuesta se estructuró teniendo en cuenta criterios como la facilidad de respuesta, la orientación favorable o desfavorable de las afirmaciones y una jerarquía lógica con cinco opciones. El cuestionario consta de tres secciones: a) datos generales (11 preguntas), b) discursos interculturales (8 preguntas) y c) prácticas interculturales (8 preguntas). Para la recopilación de respuestas se utilizó una escala Likert del 1 al 5, donde 1 es «Totalmente en desacuerdo» y 5 es «Totalmente de acuerdo».

2.3. Fiabilidad del instrumento

Para garantizar la validez del instrumento, un panel de cinco expertos en educación

intercultural y metodología de la investigación revisó el cuestionario, evaluando la relevancia, claridad y coherencia de los ítems utilizando el método de Lawshe para calcular el índice de validez de contenido (CVR). Los ítems con puntuaciones bajas se reformularon o eliminaron según sus recomendaciones, y se realizaron ajustes lingüísticos para garantizar la precisión semántica. Posteriormente, se realizó una prueba piloto a 30 estudiantes para verificar la comprensión y la consistencia interna.

Con el fin de validar el constructo y garantizar que todos sus ítems son fiables, dignos de confianza y tienen una buena consistencia interna, se utilizó el software SPSS para realizar el análisis estadístico Alfa de Cronbach, teniendo en cuenta que los valores más cercanos a 1 se refieren a una buena consistencia interna según las conclusiones de (George y Mallery, 2003). La tabla 1 muestra el resumen del procesamiento de datos correspondiente a las respuestas dadas por los estudiantes.

2.4. Procedimiento

La recopilación de datos fue realizada directamente por el equipo de investigación, siguiendo los estratos previamente definidos y respetando los horarios de clase establecidos. Los estudiantes accedieron fácilmente al cuestionario de Google Forms a través de un código QR, lo que garantizó la accesibilidad y la participación voluntaria. Una vez completadas las encuestas, los datos se limpiaron utilizando Microsoft Excel, eliminando las respuestas de los participantes que no dieron su consentimiento para garantizar la validez e integridad de la información recopilada. Se unificaron los términos «castellano» y «español», y se estandarizó la variable de edad en palabras en lugar de números. Para la tabulación de los datos

Tabla 1. Resumen del procesamiento de casos mediante SPSS
Fuente: Elaboración propia

Resumen del procesamiento de casos			
Casos		N	%
	Válidos	589	100
	Excluidos ^a	0	0
	Total	589	100

^a La eliminación por lista se basa en todas las variables del procedimiento.

Tabla 2: Valor alfa de Cronbach
Fuente: Elaboración propia

Estadísticas de fiabilidad	
Alfa de Cronbach	Nº de elementos
0,934	16

de la escala Likert, se utilizó el software SPSS para analizar las respuestas sobre la percepción de los profesores sobre la interculturalidad.

3. Results

Al realizar el análisis estadístico de las preguntas sobre género, edad, carrera y semestre, se pudo identificar que el 34.8 % eran hombres y el 65.2 % eran mujeres. Su distribución por edades corresponde al 84.9 % de los encuestados cuya edad se encuentra entre los 18 y los 24 años, el 12.7 % se encuentra en el rango de los 25 a los 30 años, el 11.9 % entre los 31 y los 40 años y el 5 % pertenece al grupo de los 41 a los 50 años.

Con el fin de analizar las respuestas de los encuestados al instrumento, se llevaron a cabo análisis descriptivos de cada uno de los ítems de la encuesta para determinar las tendencias y patrones generales en las percepciones de los estudiantes sobre la inclusión de la interculturalidad en la formación docente.

En la Tabla 3 se presentan los análisis descriptivos de las 16 preguntas que abordan la apreciación de los estudiantes sobre los conceptos de interculturalidad enseñados por los profesores. En la primera sección sobre los discursos de interculturalidad se estableció que las preguntas P6 y P7 obtuvieron una puntuación alta en el valor medio con [4.04] y [4.03] respectivamente. Este valor muestra que los estudiantes no solo entendieron el concepto de interculturalidad entendido como la multiplicidad de culturas existentes en un espacio determinado, sin que haya una relación entre ellas, ya que la mayoría respondió que está de acuerdo con su definición, sino que también consideran su integración en los planes de estudio de los profesores, lo que demuestra su interés por un enfoque pedagógico que valore la diversidad cultural.

Por otro lado, si analizamos el siguiente valor medio más alto correspondiente a la pregunta P7 La interculturalidad valora la importancia de la contextualización sociocultural y del conocimiento del plan de estudios, es evidente

que la mayoría de los estudiantes obtuvieron un valor de [4.03] en la escala de Likert, lo que refleja una posición favorable a la adaptación de los contenidos y enfoques educativos a las realidades culturales y contextuales de los estudiantes, siendo un principio clave en la implementación de la interculturalidad en la educación superior. Esta pregunta refleja que la interculturalidad tiene que ver con el respeto a la diversidad de culturas, reconociendo que la enseñanza y el aprendizaje no son hegemónicos y deben adaptarse a las realidades socioculturales.

Por otro lado, se observa que la pregunta P5 tiene el valor medio más bajo, con [3.15], correspondiente a «La interculturalidad reconoce las diversidades (étnicas, sociales, de género, intergeneracional, entre otras), donde los estudiantes mantuvieron una posición de Ni de acuerdo ni en desacuerdo cuando se les preguntó sobre el reconocimiento de las diversidades en la formación intercultural de sus profesores, ya que identifican parcialmente las diferentes formas de diversidad, lo que refleja la falta de herramientas prácticas para que los profesores no solo tengan conocimientos teóricos, sino que sean personas capaces de desarrollar habilidades que aborden la diversidad cultural, étnica y social en el aula.

En la segunda sección sobre prácticas interculturales (habilidades procedimentales y actitudinales), las preguntas P12, P13 y P14 tienen los valores medios más altos, con [4.01], [4.02] y [4.01] respectivamente. Al interpretar la pregunta P12, que destaca que la formación académica en la UNAE incluye materias que forman parte de un enfoque intercultural, cabe mencionar que los estudiantes perciben que sus profesores encargados de su preparación universitaria integran aspectos interculturales en su proceso de enseñanza; sin embargo, el valor de [4.01] nos permite reflexionar sobre posibles

Tabla 3: Análisis descriptivo de la encuesta
Fuente: Elaboración propia

Estadísticas descriptivas						
	Ítems	N	Mínimo	Máximo	Media	Desviación
Discursos sobre interculturalidad (cognitivos / LO QUE SE DICE)						
P1	La interculturalidad reconoce las diversidades (étnicas, sociales, de género, intergeneracionales, entre otras).	589	1	5	3.15	1.579
P2	La interculturalidad es solo la representación de las nacionalidades y pueblos indígenas del Ecuador.	589	1	5	3.98	1.487
P3	La interculturalidad articula el conocimiento no académico de los grupos socioculturales del país.	589	1	5	3.98	1.455
P4	La interculturalidad es un proyecto político para un nuevo tipo de sociedad en Ecuador (que incluye a las nacionalidades y pueblos indígenas, mestizos, montubios, afrodescendientes y otras diversidades).	589	1	5	3.56	1.509
P5	La interculturalidad promueve las relaciones y el intercambio «entre culturas» en condiciones equitativas, basadas en el reconocimiento, la tolerancia, la comprensión y el respeto.	589	1	5	3.97	1.455
P6	La interculturalidad se refiere a la multiplicidad de culturas que coexisten en un espacio determinado, sin que estén relacionadas entre sí.	589	1	5	4.04	1.445
P7	La interculturalidad valora la importancia de la contextualización sociocultural y del conocimiento del plan de estudios.	589	1	5	4.03	1.450
P8	La Constitución de 2008 establece que Ecuador es un Estado Intercultural y Plurinacional.	589	1	5	4.01	1.460
Prácticas interculturales (habilidades procedimentales y actitudinales / ACCIONES)						
P9	Las prácticas interculturales solo se dan en el ámbito educativo.	589	1	5	2.74	1.487
P10	Se incluyen en su formación conocimientos considerados «no académicos», como las cosmovisiones ancestrales de los grupos socioculturales (nacionalidades y pueblos indígenas, mestizos, montubios, afrodescendientes y otras diversidades).	589	1	5	3.52	1.363
P11	La UNAE forma a docentes-investigadores con un enfoque intercultural	589	1	5	3.95	1.412
P12	La formación académica en la UNAE incluye materias que forman parte de un enfoque intercultural.	589	1	5	4.01	1.363
P13	Durante el proceso de enseñanza y aprendizaje, los maestros generan espacios para la reflexión con un enfoque intercultural.	589	1	5	4.02	1.407
P14	La formación académica incluye actividades socioculturales que forman parte de un enfoque intercultural.	589	1	5	4.01	1.368
P15	La educación superior en Ecuador es intercultural	589	1	5	3.46	1.369
P16	La interculturalidad se trabaja en otros campos como la salud, la arquitectura, la comunicación, entre otros.	589	1	5	3.52	1.411

talleres de formación y prácticos dirigidos a los profesores para que puedan beneficiarse de una formación adicional en habilidades de gestión de la diversidad cultural en el aula, el uso de metodologías interculturales y la creación de entornos educativos que promuevan el respeto por la pluralidad.

La pregunta P13 Los profesores generan espacios de reflexión con un enfoque intercultural durante el proceso de enseñanza y aprendizaje representa

el valor más alto de la media con [4.02], es decir, la mayoría de los estudiantes están de acuerdo en que sus profesores suelen promover espacios de reflexión intercultural y sobre las desigualdades, fomentan la convivencia en un entorno plural y promueven una actitud de respeto y aprecio por la diversidad en el aula.

En cuanto a la pregunta P14 La formación académica incluye actividades socioculturales que forman parte de un enfoque intercultural,

con un valor de [4.01], refleja que, aunque los estudiantes valoran positivamente la inclusión de actividades como talleres de sensibilización cultural, intercambios académicos o proyectos comunitarios, es importante abordar la formación del profesorado, ya que a través de ella los profesores podrían adaptar las dinámicas a los contextos culturales de los estudiantes, es decir, fomentar la creación de un entorno de aprendizaje inclusivo.

Por otro lado, la pregunta P9 tuvo el valor medio más bajo con [2.74], es decir, los estudiantes no están de acuerdo con la siguiente afirmación: Las prácticas interculturales solo se dan en el ámbito educativo. A pesar de ser un valor muy inferior al resto de las medias, la situación no es adversa, ya que se reconoce la influencia de la formación docente en los estudiantes, ya que a través de sus procesos de enseñanza se ha conceptualizado que el respeto por otras culturas, etnias y razas no debe ser exclusivo del aula, sino que esta postura debe mantenerse en cualquier ámbito de su vida cotidiana.

Para analizar la hipótesis, se realizó un análisis correlacional basado en la variable independiente (conceptos de interculturalidad) y la variable dependiente (prácticas de interculturalidad). Este análisis nos permitió comprender cómo la formación intercultural recibida por los docentes de la Universidad Nacional de Educación (UNAE) se transmite a sus estudiantes, a través de la percepción de los conceptos y su aplicación práctica en las actitudes y el comportamiento de los estudiantes. Del mismo modo, se hizo hincapié en las relaciones entre los conocimientos teóricos adquiridos durante la formación docente y la manifestación de actitudes interculturales de sus estudiantes.

Al correlacionar la variable independiente (conocimiento) y la variable dependiente (prácticas interculturales), se obtuvieron los resultados que se presentan en la tabla 3. Para lograr este propósito, se crearon dimensiones como: CONCEPT_INTER, que se refiere a la variable de conocimiento que contenía las preguntas P1 a P8, mientras que de P9 a P16 se creó la dimensión INTER_CULTURAL_PRACTICES.

Como se puede observar en la tabla 4, existe una correlación positiva moderadamente fuerte entre las variables, lo que significa que, a medida que los profesores aclaran los conceptos de interculturalidad con mayor profundidad, la percepción positiva de los estudiantes sobre la interculturalidad también tiende a aumentar. En otras palabras, se puede decir que la formación profesional de los profesores de la Universidad Nacional de Educación (UNAE) influye en la forma en que los estudiantes comprenden y valoran la interculturalidad dentro y fuera del aula.

Estos resultados muestran que la teoría y los conceptos aprendidos por los profesores sobre la interculturalidad no son solo palabras, sino que tienen un impacto positivo en la razón de ser de los estudiantes, ya que aplican cada una de estas teorías en su vida cotidiana y cuando interactúan con personas de diferentes culturas, nacionalidades, etnias, entre otras. La transmisión de conocimientos, así como las actitudes interculturales, deben reflejarse a través de estrategias pedagógicas y de la forma de interactuar con los estudiantes, creando espacios que promuevan el respeto por la diversidad cultural.

Tabla 4: Correlación entre el conocimiento y la práctica interculturales
Fuente: Elaboración propia

		CONCEPTO_INTERCULTURAL	PRÁCTICAS_INTERCULTURALES
CONCEPTO_INTERCULTURAL	Correlación de Pearson	1	0.706

Por otro lado, si analizamos el nivel de correlación de los conceptos de interculturalidad con respecto a la percepción de los estudiantes, podemos ver que en la pregunta 1 relacionada con el reconocimiento de la diversidad cultural desde los aspectos étnicos, sociales y de género, se obtuvo un valor de correlación de [0.429] en las prácticas pedagógicas inclusivas, lo que significa que el reconocimiento y la integración de las diversas culturas en los procesos educativos por parte de los profesores tiene una influencia positiva en los estudiantes, ya que promueven una actitud inclusiva y respetuosa, la diversificación de los enfoques pedagógicos para reconocer y abordar las necesidades de sus compañeros de diferentes orígenes culturales y fuera del aula, promoviendo prácticas inclusivas con la comunidad a través de su participación en actividades culturales, entornos profesionales y la promoción y el empoderamiento de los derechos de las personas (véase la tabla 5).

Por otro lado, según los resultados de la tabla 5, el valor de correlación entre la pregunta P2: La interculturalidad es solo la representación de las nacionalidades y pueblos indígenas del Ecuador con respecto a las prácticas interculturales de los estudiantes en términos del conocimiento impartido por los maestros que reflejan la formación en interculturalidad fue [0,562], este valor indica una relación moderadamente fuerte entre las variables del estudio, sin embargo, tiende a ser contradictorio porque aquellos estudiantes que se limitan a pensar que solo los pueblos indígenas representan el conjunto de nacionalidades y pueblos estarían equivocados.

Equivocarse en este concepto conduce a actitudes limitadas en las que los estudiantes solo reconocen y consideran a las comunidades indígenas, por lo que este tipo de práctica tiende a ser menos inclusiva cuando se enfrenta a situaciones interculturales que no se ajustan a sus pensamientos. Por otro lado, al analizar la pregunta P3: La interculturalidad articula el conocimiento no académico de los grupos socioculturales del país, se obtuvo un valor de [0.581], lo que sugiere que a medida que los maestros incorporen nuevos conocimientos sobre interculturalidad, sus estudiantes podrán comprender, valorar y percibir la influencia del conocimiento en su educación. Esta pregunta enfatiza la importancia de contar con profesionales arraigados en la interculturalidad, ya que los educadores deben tener la capacidad no solo de proporcionar conocimientos académicos, sino también de considerar la inclusión de conocimientos como: conocimientos indígenas, conocimientos comunitarios (aprendizaje de lenguas y dialectos), conocimientos de convivencia, entre otros.

Los resultados muestran que las percepciones de los estudiantes sobre la interculturalidad están directamente relacionadas con la calidad y la profundidad de los conocimientos proporcionados por sus instructores. La correlación significativa entre las variables analizadas indica que cuando los educadores integran tanto el conocimiento académico como el no académico —incluido el conocimiento comunitario y las prácticas culturales— los estudiantes desarrollan una comprensión más

Tabla 5: Resultados de la correlación de las preguntas de la variable independiente con respecto a la variable dependiente
Fuente:Elaboración propia

Correlaciones		P1	P2	P3	P4	P5	P6	P7	P8	IP
P1	Correlación de Pearson	1								
P2	Correlación de Pearson	0,378	1							
P3	Correlación de Pearson	0,392	0,735	1						
P4	Correlación de Pearson	0,427	0,567	0,587	1					
P5	Correlación de Pearson	0,343	0,673	0,728	0,583	1				
P6	Correlación de Pearson	0,331	0,731	0,749	0,572	0,767	1			
P7	Correlación de Pearson	0,342	0,741	0,756	0,562	0,796	0,825	1		
P8	Correlación de Pearson	0,324	0,689	0,718	0,528	0,755	0,794	0,788	1	
IP	Correlación de Pearson	0,429	0,562	0,581	0,510	0,608	0,635	0,627	0,644	1

amplia y crítica de la diversidad. Esto tiene importantes implicaciones para la formación del profesorado: es necesario reforzar los programas para incorporar competencias interculturales y enfoques descolonizadores, garantizando que los futuros profesionales sean capaces de promover prácticas inclusivas y respetuosas. A nivel de política universitaria, se recomienda revisar los planes de estudio para garantizar la integración transversal de la interculturalidad, así como implementar estrategias institucionales que fomenten la formación continua del profesorado en esta área. De esta manera, la educación superior contribuye a construir un entorno académico que responda a la pluralidad cultural del país y a los principios de equidad y justicia social.

Para la pregunta P4: La interculturalidad es un proyecto político para un nuevo tipo de sociedad en Ecuador (que incluye a las nacionalidades y pueblos indígenas, mestizos, montubios¹, afrodescendientes y otras diversidades), se obtuvo un valor de correlación positiva moderada de [0,510], lo que confirma que los estudiantes que reciben formación intercultural por parte de los docentes universitarios valoran y comprenden la importancia de este concepto como parte de los proyectos estatales que transforman la percepción de las personas, logrando así un territorio inclusivo que reconoce la diversidad de culturas y tradiciones que conviven.

Los resultados de la correlación para la pregunta P5: La interculturalidad promueve las relaciones y el intercambio «entre culturas» en términos equitativos, basados en el reconocimiento, la tolerancia, la comprensión y el respeto fueron de [0,608], lo que representa una correlación positiva moderadamente fuerte. Este valor sugiere que, dado que los estudiantes perciben la interculturalidad como un proceso de intercambio de conocimientos entre culturas, no solo desde una perspectiva teórica, sino como parte de los principios de tolerancia y reconocimiento, adoptarán una postura más inclusiva centrada en el respeto por las diferencias culturales.

Del mismo modo, el valor de correlación para la pregunta P6: La interculturalidad se refiere a la multiplicidad de culturas que existen en un espacio determinado, sin que haya una relación

entre ellas fue de [0,635], lo cual es positivo y moderado. Al interpretar este valor, es evidente que los profesores, incluso cuando integran conocimientos sobre interculturalidad, no tienden necesariamente a expresar una relación entre ellos; por lo tanto, los estudiantes desarrollan en ellos un sentido de percepción de la diversidad cultural, pero no se centran necesariamente en tender puentes y fomentar las relaciones entre culturas.

Los resultados obtenidos para las preguntas P4, P5 y P6 muestran correlaciones positivas y estadísticamente significativas que van de moderadas a moderadamente fuertes ($r = 0,510$; $r = 0,608$; $r = 0,635$; $p < 0,05$). Esto indica que la formación intercultural impartida por los profesores universitarios influye en la forma en que los estudiantes conceptualizan la interculturalidad como un proyecto político, como un proceso de intercambio equitativo entre culturas y como el reconocimiento de la diversidad dentro de los espacios compartidos. Sin embargo, el valor asociado a la P6 sugiere una limitación: aunque se reconoce la multiplicidad cultural, no siempre se promueve la construcción de relaciones entre culturas, lo que supone un reto para la práctica docente.

Por último, al analizar las preguntas P7: La interculturalidad valora la importancia de la contextualización sociocultural y el conocimiento del currículo y P8: La Constitución de 2008 establece que Ecuador es un Estado Intercultural y Plurinacional, cuyos valores fueron [0,627] y [0,644] respectivamente, se destaca la importancia de las instituciones educativas y los organismos reguladores a través de normativas para el reconocimiento de los pueblos y nacionalidades del territorio ecuatoriano. Estos valores de correlación, de carácter positivo y moderado, indican que tanto la contextualización del conocimiento en el currículo como el marco normativo de la Constitución de Ecuador desempeñan un papel clave en la educación de los estudiantes con respecto a la interculturalidad.

¹ Campesinos costeros ecuatorianos.

3.1 Interculturalidad y teoría fundamentada

Esta investigación se basa teóricamente en un diálogo crítico entre múltiples perspectivas epistemológicas que enriquecen la comprensión de la interculturalidad. La teoría de la descolonización de Boaventura de Sousa Santos revela una ruptura epistemológica emergente que trasciende los marcos tradicionales del conocimiento colonial, configurando una «ecología del conocimiento». La teoría sociocultural de Vygotsky aporta la dimensión de la construcción dialógica del conocimiento, entendiendo el aprendizaje como un proceso social de interacción en el que los significados culturales se co-construyen dinámicamente.

La perspectiva crítica de Walsh complementa este enfoque al conceptualizar la interculturalidad como un proyecto político de transformación, una práctica de resistencia que reconfigura las relaciones de poder. Por último, el modelo de acción comunicativa de Habermas introduce la noción de un diálogo horizontal que busca el entendimiento mutuo, superando las barreras de la comunicación monocultural tradicional. Estas teorías convergen para sustentar una comprensión compleja de la interculturalidad como un proceso dinámico de reconocimiento, diálogo y reconstrucción permanente del conocimiento educativo.

La investigación desarrollada nos permite construir una teoría fundamentada que desentraña los complejos procesos de la interculturalidad en la formación docente, revelando un fenómeno multidimensional de transformación epistémica y cultural. Del análisis sistemático de los datos surge una categoría central: la transformación intercultural como proceso dinámico de reconocimiento, diálogo y reconstrucción del conocimiento educativo. Esta categoría se sustenta en múltiples dimensiones interconectadas que revelan la complejidad de la interculturalidad más allá de la simple coexistencia de diferencias.

La relación entre el discurso descolonial y la práctica docente requiere una articulación más profunda que vaya más allá de la mera incorporación de contenidos interculturales. Walsh

(2010) sostiene que la educación debe entenderse como un espacio de resistencia y transformación frente a la colonialidad del conocimiento, lo que implica cuestionar las estructuras epistémicas que sostienen la hegemonía eurocéntrica. En este sentido, Fornet-Betancourt (2004) postula que el diálogo intercultural debe ser simétrico y orientado hacia la justicia cognitiva, mientras que Tubino (2015) advierte que la interculturalidad no puede reducirse a políticas funcionales, sino que debe promover procesos de descolonización pedagógica. Dietz (2012) complementa esta perspectiva al enfatizar la necesidad de integrar el conocimiento local y las prácticas comunitarias en la formación docente, fomentando una praxis que responda a contextos plurales. Sin embargo, la falta de coherencia epistemológica entre estas posiciones teóricas y su aplicación en el aula pone de relieve la urgencia de una investigación que profundice en cómo el discurso descolonial se traduce en estrategias pedagógicas concretas.

El contexto institucional de la Universidad Nacional de Educación (UNAE) actúa como un espacio de mediación donde los modelos educativos tradicionales se ponen en tensión. Las estrategias de acción intercultural se materializan a través de la inclusión de materias específicas, la generación de espacios de reflexión y el desarrollo de diversas actividades socioculturales, con valores medios superiores a 4,0 en la escala de Likert, lo que indica una apertura significativa hacia prácticas pedagógicas transformadoras.

Las consecuencias de este proceso se manifiestan en múltiples niveles. A nivel epistemológico, se cuestionan los modelos hegemónicos de producción de conocimiento. En el ámbito pedagógico, se generan espacios de diálogo que trascienden la mera tolerancia, promoviendo una comprensión crítica de la diversidad cultural. En el contexto social, se promueve una reconfiguración de las relaciones de poder tradicionalmente establecidas.

La teoría fundamentada propuesta entiende la interculturalidad como un fenómeno complejo que no se limita al reconocimiento pasivo de las diferencias, sino que se constituye como una práctica activa de transformación social. Se trata de un proceso dialéctico en el que

los sujetos educativos no solo reconocen la diversidad, sino que la construyen y reconstruyen permanentemente. Las limitaciones de esta teoría residen en su contextualización específica. La muestra, concentrada en una universidad ecuatoriana, presenta una representación reducida de los grupos minoritarios (poblaciones indígenas y afrodescendientes) y una perspectiva predominantemente mestiza. Sin embargo, son precisamente estas limitaciones las que abren nuevas posibilidades para la investigación y el estudio posterior.

La teoría fundamentada revela la interculturalidad como un proyecto pedagógico y político de transformación. No se trata de una simple metodología educativa, sino de un compromiso con la construcción de un conocimiento más horizontal, crítico y contextualizado, que reconoce la multiplicidad de conocimientos y experiencias que conforman la realidad social contemporánea. Esta construcción teórica nos invita a repensar los modelos tradicionales de formación docente, proponiendo un enfoque que entiende la educación como un espacio de diálogo, reconocimiento y transformación permanente de las realidades culturales.

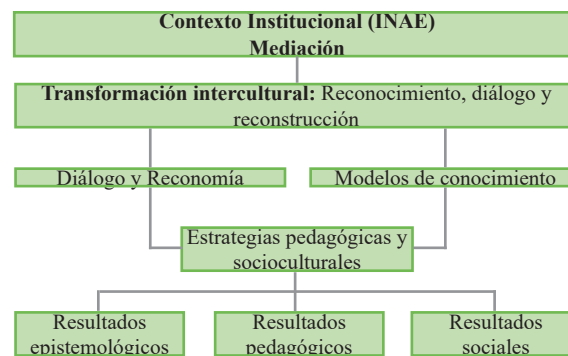


Figura 6: Modelo paradigmático - Teoría fundamentada / Interculturalidad en la formación docente.
Fuente: Elaboración propia.

4. Discusión

Al analizar el estudio de Sánchez et al. (2023) sobre la percepción de los formadores de docentes universitarios sobre cuestiones de interculturalidad en una universidad del centro-sur de Chile, una entrevista a ocho académicos determinó las competencias que los formadores consideran que los docentes deben tener para favorecer la interculturalidad en los procesos de enseñanza y aprendizaje, una de las cuales era la empatía, cualidad que los docentes deben tener para situarse cognitivamente y afectivamente en el lugar de los estudiantes, comprendiendo sus necesidades, emociones y perspectivas. Entre las principales limitaciones que han tenido que afrontar los educadores, es evidente que sus procesos de formación no incorporan

competencias interculturales, ya que sus planes de estudio son rígidos y de carácter poco disciplinario. Del mismo modo, debido a la falta de políticas públicas que promuevan la integración de la educación intercultural, se generan sesgos a la hora de implementar prácticas educativas centradas en la diversidad cultural.

Por su parte, Pareja et al. (2021), en su estudio titulado «Estudio cualitativo sobre la sensibilidad educativa intercultural del profesorado de la Universidad de Málaga (España)», definen que a través de la interculturalidad se pueden abordar cuestiones relacionadas con los derechos humanos y se pueden fundamentar los valores del respeto, la tolerancia y la empatía; además, a

través de este concepto, se valora la interacción de las culturas, lo que permite la creación de espacios de convivencia para construir una identidad colectiva. Esta posición se compara con los resultados del análisis correlacional de Pearson del estudio, especialmente en la pregunta P5, que tuvo un valor de correlación de 0,608 relacionado con la función de la interculturalidad como espacio que promueve el intercambio de conocimientos entre culturas, manteniendo la ideología de la tolerancia, la comprensión y el respeto.

Eudaldo Espinoza (2020) diseñó una estrategia metodológica para abordar la interculturalidad en la formación docente, la propuesta constaba de tres etapas: 1) propedéutica, 2) implementación y 3) control. Al evaluar los resultados antes y después de la aplicación de esta metodología, se observó que los prejuicios racistas y culturales aún persisten en los programas de formación docente; sin embargo, el 17.9 % de los docentes considera que sus actitudes racistas son «muy mejorables», el 29.8 % considera que podrían mejorarse y, después de la aplicación, el 4 % de los docentes afirmó que su comportamiento podría ser muy mejorable y el 5.5 % podría mejorarse.

León et al. (2020), al igual que Espinoza (2020) en el estudio *«El desempeño profesional de los maestros y su preparación en educación intercultural»*, desarrollaron un programa de formación centrado en la resolución de conflictos y en el fortalecimiento de las competencias de los maestros para abordar cuestiones interculturales. Los resultados muestran que el 97.45 % de los profesores afirmaron no tener conocimientos sobre los principios de la educación intercultural; por otro lado, el 89.3 % afirmaron que su adaptación a la enseñanza de alumnos de otros países se hacía de forma empírica, sin ninguna formación en la materia. En cuanto a su formación profesional, el 55.5 % de los profesores indicó que las directrices del proceso pedagógico universitario no se centraban en la educación intercultural, lo que provocó que el 22.5 % expresara dudas sobre este proceso.

Por el contrario, en el estudio de Roiha y Sommier (2021), que analizó las percepciones y experiencias de los profesores sobre la educación

intercultural a través de un cuestionario, se encontró que la mayoría de los profesores adoptaban un enfoque cultural-diferencialista y esencialista. Además, debido a su limitada formación previa en educación intercultural, demostraban solo una comprensión superficial de las desigualdades estructurales, como el racismo y la discriminación de género, dentro del aula.

En línea con esta perspectiva, Figueredo et al. (2020) analizaron la misma cuestión y obtuvieron resultados similares en relación con la formación de los profesores en educación intercultural. Concretamente, el 30 % de los participantes indicó que no se promueve el aprendizaje de diferentes idiomas y culturas, mientras que el 65,7 % afirmó que sus conocimientos son únicamente teóricos y el 49,1 % declaró haber aprendido sobre interculturalidad a través de la experiencia práctica. Además, el estudio destaca que el 95 % de sus alumnos no adquieren competencias interculturales expresadas de manera coherente en todo el plan de estudios, sino solo a través de determinadas materias aisladas.

Las posiciones de Figueredo et al. (2020) se ven confirmadas por la hipótesis del estudio, que muestra que los conocimientos sobre interculturalidad impartidos por los docentes pueden influir en la construcción de prácticas interculturales de sus alumnos a través de su capacidad para modelar actitudes y enfoques inclusivos de respeto a la diversidad cultural. Al correlacionar las variables, se obtuvo un valor significativo de 0,706, de modo que la formación en interculturalidad permite a los profesores reconocer situaciones de desigualdad de poder, racismo o discriminación por género, clase o nacionalidad, fomentando la creación de entornos inclusivos y, en el caso de los estudiantes, un espacio de reconocimiento en el que no se ven limitados por su origen.

Los resultados obtenidos en la investigación muestran una alta fiabilidad del instrumento utilizado para evaluar la percepción de los estudiantes universitarios con respecto a la formación intercultural de sus profesores, el valor obtenido fue de 0.934, lo que indica que existe una buena consistencia interna entre las respuestas. El análisis descriptivo de cada ítem

del cuestionario reveló que las preguntas P6 y P7 obtuvieron puntuaciones medias de 4.04 y 4.03 respectivamente. Los resultados obtenidos de este análisis reafirman que los estudiantes, a través de los procesos de enseñanza de sus profesores, no solo comprenden el concepto de interculturalidad, sino que también valoran la integración de este tema en sus planes de estudio como un medio para reafirmar la convivencia de la diversidad de culturas.

En cuanto al análisis de correlación de la hipótesis, se observó una correlación positiva moderadamente fuerte ($r=0,706$) entre las dimensiones del conocimiento de la interculturalidad y cómo estas influyen en la base de las prácticas de los estudiantes. A medida que los maestros profundizan y construyen su conocimiento sobre cuestiones interculturales, los estudiantes tenderán a desarrollar una percepción afirmativa de la pluralidad cultural mediante la creación de espacios que reconozcan la diversidad, promuevan la educación inclusiva y se forjen en el respeto y la equidad.

El análisis de la bibliografía existente mostró que, a pesar de los estudios cuyos resultados reflejaban estadísticas positivas, todavía existen lagunas en la investigación sobre la interculturalidad en la formación docente. Una de ellas es la posición y las experiencias de los docentes, que son una parte importante de la implementación de la interculturalidad en el aula. Por lo tanto, las investigaciones futuras deberían considerar

el análisis de ambos puntos de vista y de los factores que impiden el desarrollo óptimo de la formación docente en cuestiones interculturales, por ejemplo, la falta de profesionales de cuarto nivel con amplios conocimientos sobre este tema.

El estudio proporciona pruebas significativas sobre las percepciones de los estudiantes universitarios respecto a la inclusión de la interculturalidad en la formación docente, destacando la necesidad de integrar contenidos y prácticas que fortalezcan las competencias interculturales en los programas académicos. Estos resultados sugieren que las universidades deben revisar sus políticas curriculares y hacer hincapié en la importancia de diseñar estrategias institucionales que promuevan el desarrollo profesional continuo del profesorado en competencias interculturales, consolidando así el modelo pedagógico-educativo de la UNAE.

Entre las limitaciones del estudio, se reconoce que el análisis se centró exclusivamente en las percepciones de los estudiantes, sin incorporar las perspectivas de los profesores ni la evaluación de las prácticas reales en el aula. Para futuras investigaciones, se recomienda ampliar la muestra para incluir a profesores y personal administrativo, así como integrar métodos mixtos que impliquen la observación directa y análisis longitudinales. Asimismo, sería relevante explorar el impacto de la formación intercultural en el desempeño profesional y en la transformación de las políticas educativas.

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