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Artificial intelligence in understanding and supporting autism spectrum disorder

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Abstract---Currently, many people have autism spectrum disorder (ASD). Artificial intelligence has revolutionized aspects of cognitive development, particularly in children and young people. This research aimed to understand how artificial intelligence can support the comprehension process from a very early age. The methodology employed included a literature review, inductive reasoning, and qualitative analysis, resulting in a clear understanding of how new technologies can contribute to the intellectual development of individuals with this disorder. The findings revealed that ASD is a condition affecting many people globally, including in Latin America, where many countries are currently developing policies to improve communication and behavior for individuals with this condition, leveraging artificial intelligence as a technology to enhance communication and advance their education.
Keywords---personal disorders, communication, special education, new technologies.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that affects millions of people worldwide. It is characterized by difficulties in social communication, repetitive behavior patterns, and, in many cases, a distinct sensory perception. Each person with ASD experiences the world in a unique way, so therapeutic and educational approaches must be individualized and sensitive to this diversity (Alcañiz, Olmos, & Abad, 2019). In this context, artificial intelligence (AI) has emerged as a powerful tool to improve the diagnosis, intervention, and inclusion of people with ASD in various settings.

The advancement of AI in fields such as medicine, psychology, and education has opened new possibilities for detecting ASD earlier (González, 2023), offering personalized support, and building technological tools adapted to the needs of each individual. Artificial intelligence can help identify early signs of ASD and facilitate more personalized and effective interventions that aid in the early care of children.
AI focuses on its applications for the development of social skills, early detection and intervention or treatment of the disease, while raising the ethical considerations and challenges involved in combining AI in the care of ASD (Xing, 2024).

Materials and methods

To conduct this research, a literature review was performed. A systematic search was conducted in academic databases such as Scopus, Web of Science, PubMed, IEEE Xplore, and Google Scholar. This allowed for an international analysis, focusing on Latin America and specifically Ecuador, where a qualitative analysis was carried out on the introduction of AI to support the development of students with Autism Spectrum Disorder (ASD). Empirical studies, systematic reviews, and conference papers were highlighted, considering the applications of AI in diagnosis, intervention, communication, and social inclusion of individuals with this disorder. Educational and

communication support tools, as well as ethical and accessibility aspects, were qualitatively assessed.

For the qualitative analysis, content analysis was used to identify patterns and trends. For the quantitative data reported in the studies (algorithm accuracy, improvement percentages, diagnosis times), descriptive analysis was employed.

Analysis and discussion of the results

Early diagnosis with the help of AI

One of the main challenges in treating ASD is timely diagnosis. Traditionally, this process can take months or even years due to waiting lists, a lack of specialists, and the complexity of diagnostic criteria. However, AI systems based on machine learning have shown a great capacity to detect signs of ASD by analyzing data such as facial expressions, language patterns, and eye movements (Meneses & Araújo, 2024).

A study developed using deep learning techniques by applying different methods was able to analyze video recordings of young children to identify potential indicators of ASD with 96% accuracy. This tool could allow healthcare professionals and families to access a preliminary diagnosis more quickly, facilitating early interventions and improving long-term prognosis (Reddy & Andrew, 2023).

Virtual assistants and social robots as therapeutic support

Beyond diagnosis, AI is also revolutionizing how daily support is provided to people with ASD (Vagnetti, Di Nuovo, & Mazza, 2024). In recent years, social robots and virtual assistants designed to interact with children and adults on the spectrum have emerged, helping them develop social, emotional, and communication skills. The authors designed and implemented educational activities with the "Codey Rocky" robot, a ready-to-use robot designed for elementary school children to learn coding and programming.

Other types of robots have been used in therapeutic settings to promote joint attention, empathy, and emotional expression in children with ASD. Social robots have been shown to increase social participation and improve interaction in children with ASD, thanks to their predictability and adaptability, achieving relevant aspects in treatment (Hervas & Romarís, 2019).

Mobile applications with AI have been developed that can offer visual routines, reminders, emotional regulation aids and even body language translators, improving the autonomy and quality of life of many people with ASD (Courtois, 2024), thus achieving an impact of these technologies.

Ethical considerations and community participation

While it is permissible to acknowledge the considerable support for AI, it is also important to address its ethical challenges, where one of the main risks is the use of algorithms that have not been designed with a deep understanding of neurodiversity in this context.In some cases, these claims are challenged in several ways and raise many more questions about language, thought, andmental health in generalwhich can lead to misinterpretations or non-inclusive solutions (Alderson & Pearson, 2023).

Autistic rights organizations such as the Autistic Self Advocacy Network insist that "AI technologies must be developed with the active participation of the autistic community to avoid decontextualized or stigmatizing solutions" (ASAN, 2013). Furthermore, it is essential to guarantee the protection of personal data and the ethical use of sensitive information collected in automated systems.

Contextualization in Latin America and Ecuador

To compare global findings with the regional reality, reports, projects, and public policies on autism spectrum disorder (ASD) and intellectual disability (ID) in Latin America were reviewed, with particular attention to the Ecuadorian context. Data from organizations such as the WHO, PAHO, and local ministries of health and education were included.

Autism Spectrum Disorder and Artificial Intelligence in Latin America: Challenges and Advances

In Latin America, differences between countries, common challenges, and some noteworthy initiatives have been considered. Here, the potential of artificial intelligence as a support tool for the diagnosis, education, and inclusion of people with ASD is beginning to be explored. Although there are differences between countries, the region shares similar structural challenges: overburdened healthcare systems, lack of access to early diagnosis, a shortage of specialists, and a still limited integration of emerging technologies in the social and educational spheres.

Figure 1 shows the challenges for the Latin American region in integrating this topic into the social sphere.

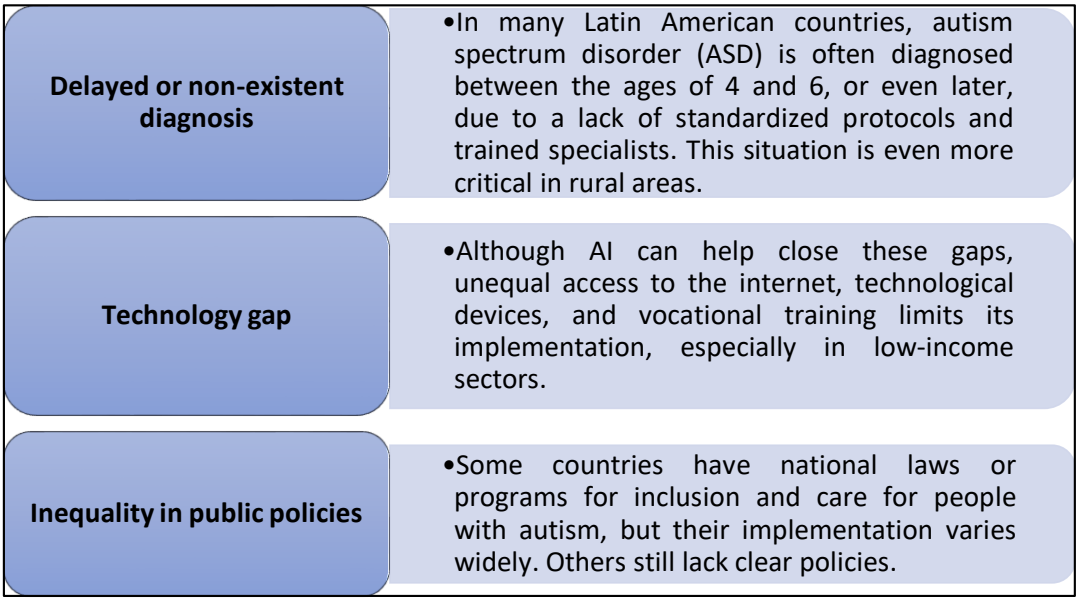

Figure 1. Challenges of the Latin American region

The Latin American region faces the dual challenge of developing technological capabilities and ensuring social inclusion, which requires an integrative vision that considers neurodiversity (ECLAC, 2024).

In some countries, different initiatives stand out; for example, Brazil, which is one of the country's best prepared in this area, has developed AI systems for ASD screening using video and audio analysis (Torres, Cerrón, & Lescano, 2025). In this sense, conventional instruments tend to be refined and better adapted to local contexts, while technological ones could allow for a more accurate and earlier diagnosis of ASD in children.

In Mexico, the topic is also being addressed, where work has been done on machine learning models to detect traits of the autism spectrum in preschool children. Some NGOs, such as Let us illuminate by the TEA, promote the use of technology for inclusive education.

Colombia is also engaged in exploring AI technologies in different projects, such as for students with special educational needs. Here at the University of the Andes, they have explored the use of AI to personalize teaching and have implemented social robotics pilots in educational centers (Urrutia, Tipanguano, Barreno, & Mejía, 2025).

Another country working on this topic is Argentina, which has developed digital tools such as "Mi Habla," an app that uses pictograms and AI to facilitate augmentative communication in non-verbal children (Guzmán, Putrino, Martínez, & Quiroz, 207). The

country has a national law on ASD, although its implementation varies between provinces.

Chile has made progress in educational inclusion and the development of apps like Kloog, focused on social skills for children; some private centers have also begun to incorporate AI in personalized therapies (Yáñez, et al., 2021).

Despite the limitations, the region has opportunities if it manages to coordinate efforts between governments, universities, NGOs and the private sector, since AI has shown that with different mobile applications, virtual assistants and cloud platforms it can bring support services to areas where specialists did not previously reach, democratizing education.

Autism Spectrum Disorder in Ecuador: An Opportunity to Develop

In Ecuador, the use of artificial intelligence-based technologies applied to ASD, is still in an emerging phase. Although the country has made progress in educational inclusion policies and early intervention programs, significant challenges remain regarding access to diagnosis and specialized therapies, particularly in rural areas. One of the main obstacles is the shortage of specialized professionals and the underreporting of cases. According to data from the Ministry of Public Health (Ministry of Public Health, 2023), more than 9,000 ASD diagnoses were registered, although social organizations warn that the actual number could be much higher.

The use of AI applications for early screening or educational assistants could make a difference in contexts where there is little availability of specialists. Some universities, such as the National Polytechnic School and UDLA, have begun to develop technological projects with an educational and inclusive focus (Maldonado, 2024), although they are not yet widespread at the national level.

Ecuadorian entrepreneurs are exploring the development of digital tools for augmentative communication or emotional tracking, especially for non-verbal autistic children (Chaves, 2021).

One of the challenges is achieving personalized education, where AI-powered platforms can adapt content for students with autism spectrum disorder (ASD), helping to overcome the traditional model. In the case of public policy, technology can analyze large volumes of information to guide more precise decisions in health and education.

In some educational institutions, research has been conducted on the influence of ASD on academic development, addressing both the challenges and opportunities it presents in terms of academic performance and student relevance (Candela,

Quintanar, & Alcívar, 2025). These authors carried out a figurative review and qualitative research, examining the characteristics of ASD and its effect on teachers and families to promote inclusion. They concluded that the curriculum should be adapted by incorporating inclusive pedagogical strategies, and that communication between home and school should be strengthened to significantly improve the integration and academic performance of students with this disorder.

The inclusion of neurodiversity in technological development is not only an ethical issue, but a necessity to build fairer and smarter societies (Latin American Network of Technology and Autism, 2024).

Strategic advantages of neurodiversity in technology

Including neurodiversity in technological development is not only an ethical practice, but a comprehensive strategy with real impact that generates innovation, improves productivity, enhances ethical decisions and strengthens the economic performance of the education sector; these strategies have some advantages.

- ***Innovation and creativity***: They include neuro-diverse minds that contribute lateral thinking, unique solutions and new ways of solving problems (INTRAMA, 2024).
- ***High attention to detail and productivity:*** Neurodivergent people excel in pattern recognition, sustained concentration, and accuracy, which translates into fewer errors and greater efficiency (Ross, 2019).
- ***Improved decision-making and organizational resilience:*** Cognitive diversity promotes collective creativity, reduces groupthink, and strengthens adaptability (Cepeda, 2025).
- ***Diversification and retention of talent:*** Companies that promote neurodiversity expand their ability to attract talent, improve retention, and strengthen their reputation.
- ***More humane and ethical AI governance:*** Neurodivergent people can bring different perspectives that enrich responsibility and ethical decisions in AI (Olusunle, 2025).

New technologies, especially AI, help students diagnosed with ASD. AI allows the detection of patterns and trends through content analysis. It can collect data, prepare interviews, and create educational apps and social networks that help categorize people by emotions, language, and interactions. Algorithms can also be created to detect repetitions and relationships where changes in skills or behavior manifest over time, interpret the results, and adjust therapies and personalized support (Gómez, 2023).

Artificial intelligence is emerging as an ally in helping people with ASD, facilitating early diagnoses and offering individualized support that improves quality of life

through tools based on this technology. These tools allow for the analysis of large volumes of behavioral, emotional, and linguistic data, helping to identify signs of ASD more accurately and accessibly. Furthermore, the use of technologies such as social robots and virtual assistants is proving useful in developing social skills and fostering autonomy in people with ASD.

Conclusions

In Latin America, artificial intelligence has not yet reached its full potential in working with children with ASD, but there are significant advances in several countries that demonstrate that it is possible to overcome structural challenges. All of this will require public investment, international collaboration and political will, but also strong participation from families and people with ASD in the design of these technologies; only in this way can AI become a true tool for inclusion.

In countries like Ecuador, AI represents an emerging opportunity to close access gaps and improve educational and social inclusion; however, this path must be accompanied by sustainable public policies, specialized training and, above all, by the active participation of the autistic community in the development of solutions that truly meet their needs.

References

Ministerio de salud Pública. (2023). *La Ley Orgánica de Transparencia y Acceso a la Información Pública.* https://www.salud.gob.ec/transparencia/

Alcañiz, M., Olmos, E., & Abad, L. (2019). Uso de entornos virtuales para trastornos del neurodesarrollo: una revisión del estado del arte y agenda futura. Medicina. *79* (1), (Supl. 1), 77-81. https://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S0025-76802019000200016&lang=es

Alderson, B., & Pearson, A. (2023). ¿Qué nos dice la neurodiversidad sobre el habla interna y viceversa? Una perspectiva teórica. *Corteza, 68*, 193-202. https://doi.org/10.1016/j.cortex.2023.08.008.

ASAN. (2013). *A Handbook on Self Advocacy.* Obtenido de https://autisticadvocacy.org/

Candela, L. A., Quintanar, J. M., & Alcívar, D. A. (2025). Autism and its impact on school development. *International Journal of Health & Medical Sciences, 8*(2), 23-29. doi: https://doi.org/10.21744/ijhms.v8n2.2381

CEPAL. (2024). *Panorama Social de América Latina y el Caribe, 2024: desafíos de la protección social no contributiva para avanzar hacia el desarrollo social inclusivo.* https://www.cepal.org/es/publicaciones/80858-panorama-social-america-latina-caribe-2024-desafios-la-proteccion-social

Cepeda, G. (2025). *Cómo la neurodiversidad transforma la innovación organizacional.* https://hortoninternational.com/how-neurodiversity-transforms-organizational-innovation/?utm_source=chatgpt.com

Chaves, S. S. (2021). *El Autismo no verbal y el uso de sistemas alternativos y aumentativos de comunicación.* Quito. https://repositorio.uasb.edu.ec/bitstream/10644/8347/1/T3642-MTDI-Chaves-Autismo.pdf

Courtois, C. I. (2024). impacto de tecnologías asistidas en personas con trastornos del espectro Autista: revisión de la literatura. *Ciencia Latina Revista Científica Multidisciplinar, 8*(4). https://doi.org/10.37811/cl_rcm.v8i4.13005

Gómez, M. I. (2023). Avances en la tecnología para el desarrollo de la competencia social del alumnado con trastornos del espectro autista.Revisión sistemática. *Páginas de Educación, 16*(2), 156-185. https://doi.org/10.22235/pe.v16i2.3299

González, C. S. (2023). El impaco de la inteligencia artificial en la educación: Transformación delaforma de enseñar y aprender. *Revista Qurriculum, 36*, 51-60. https://doi.org/10.25145/j.qurricul.2023.36.03

Guzmán, G., Putrino, N., Martínez, F., & Quiroz, N. (207). Nuevas tecnologías: Puentes de comunicación en el trastorno del espectro autista (TEA). *Terapia psicológica, 35*(3), 247-258. https://dx.doi.org/10.4067/S0718-48082017000300247

Hervas, A., & Romarís, P. (2019). Adaptación funcional y trastornos del espectro autista. Medicina (Buenos Aires. *79*(1), 10-15. https://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S0025-76

INTRAMA. (2024). *Estrategias para la inclusión en la industria tecnológica neurodiversa.* https://www.intrama.es/neurodiversidad-en-el-mundo-empresarial-innovacion-y-oportunidades-en-la-inclusion

Maldonado, N. E. (2024). La arquitectura y el TEA: propuestas espaciales para centros educativos a partir de la aplicación de la IA. http://dspace.udla.edu.ec/handle/33000/16537

Meneses, A. C., & Araújo, I. (2024). Aprovechar la inteligencia artificial para mejorar la calidad de vida de los pacientes con trastorno del espectro autista: una revisión exhaustiva. *Europa Journal of Clnical Medicine, 5*. doi:10.24018/clinicmed.2024.5.5.350

Olusunle, A. (2025). *Cómo las mentes neurodivergentes podrían humanizar la gobernanza de la IA.* Obtenido de https://www.weforum.org/stories/2025/07/how-neurodivergent-minds-can-humanize-ai-governance/?utm_source=chatgpt.com

Olusunle, A. (2025). *Empleos y el futuro del trabajo.* https://www.weforum.org/stories/2025/07/how-neurodivergent-minds-can-humanize-ai-governance/?utm_source=chatgpt.com

Pediatrics, A. A. (2025). *La página sobre la crianza de los niños de la AAP.* https://www.healthychildren.org/Spanish/Paginas/default.aspx

Reddy, P., & Andrew, J. (2023). Diagnóstico del autismo en niños mediante técnicas de aprendizaje profundo mediante el análisis de rasgos faciales. *Procedimientos de ingeniería, 59*(1), 198. https://doi.org/10.3390/engproc2023059198

Ross, A. (2019). *Comprender los beneficios y desafíos de la neurodiversidad en la tecnología.* Obtenido de https://www.information-age.com/neurodiversity-in-tech-13628/?utm_source=chatgpt.com

Torres, Y. M., Cerrón, H. P., & Lescano, G. S. (2025). Técnicas e instrumentos para evaluar el Trastorno del Espectro Autista (TEA): una revisión sistemática. *VIVE. Revista de Investigación en Salud, 8*(22). https://revistavive.org/index.php/revistavive/article/view/584/1396

Urrutia, J. A., Tipanguano, L. G., Barreno, S. N., & Mejía, N. d. (2025). Desafíos y perspectivas de implementar de la inteligencia artificial en el sistema educativo en UNIANDES. *Revista Conrado, 21*(103). https://conrado.ucf.edu.cu/index.php/conrado/article/view/4428

Vagnetti, R., Di Nuovo, A., & Mazza, M. e. (2024). Robots sociales: una herramienta prometedora para apoyar a las personas con autismo. Revisión sistemática de investigaciones recientes y análisis crítico desde la perspectiva clínica. *Rev J Autism Dev Disord*. https://doi.org/10.1007/s40489-024-00434-5

Xing, N. (2024). Inteligencia Artificial para apoyar a niños con autismo. *Revista de Innovaciones Médicas Impulsadas por IA, 2*(1). https://doi.org/10.60087/vol2iisue1

Yáñez, C., Madariaga, L., López, C., Troncoso, M., Lagos, P., González, P., . . . Albo, J. (2021). Uso terapéutico de robótica en niños con Trastorno del Espectro Autista. *Andes pediatrica, 29*(5), 747-753. doi:http://dx.doi.org/10.32641/andespediatr.v92i5.2500