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Assessment of mathematics and development of skills for admission to Ecuadorian higher education

Ordóñez-Barberán, Plutarco Severo*
Sánchez-Godoy, Darwin Daniel**
Tocco-Tocco, Bacilia Lucía***
Allauca-Pancho, Fabián Roberto****

Abstract

Admission to higher education in Ecuador requires a set of socio-cognitive skills that must be fostered from the secondary education system. Therefore, it is essential to guide pedagogical processes at this level. Thus, the objective of this article is to describe the pedagogical strategies that promote the strengthening of mathematical competencies at the Ecuadorian secondary level as a determining factor in improving students' opportunities for access, retention, and academic success in higher education, especially in science, technology, and engineering fields. Methodologically, a critical hermeneutic analysis of scientific articles was conducted using databases such as Scopus, Web of Science, SciELO, Dialnet, and Google Scholar, which emphasize the need to promote active methodologies for mathematics assessment. The results showed that mathematics assessment is one of the fundamental elements for enhancing high school students' chances of accessing and succeeding in university studies. Therefore, it is concluded that in Ecuador, mathematical assessment in secondary education is geared towards the development of skills rather than the simple memorization of content, promoting the student's ability to interpret, model, and solve problematic situations in diverse contexts.

Keywords: Mathematics assessment; admission to higher education, secondary educational level, critical thinking, abstract thinking.

* Doctor en Educación. Magíster en Docencia y Gerencia en Educación Superior. Ingeniero de Sistemas. Docente en la Unidad Educativa Ciudad de Machala, Machala, Ecuador. E-mail: rojofraty@gmail.com ORCID: <https://orcid.org/0000-0002-3678-9774>

** Magíster en Tecnología e Innovación Educativa. Licenciado en Ciencias de la Educación mención Físico Matemáticas. Docente en la Unidad Educativa Ciudad de Machala, Machala, Ecuador. E-mail: danny20_21@hotmail.com ORCID: <https://orcid.org/0009-0001-3765-6164>

*** Magíster en Educación de Bachillerato con mención en Pedagogía de las Ciencias Sociales. Docente en la Unidad Educativa Luis Amando Ugarte Lemus, Machala, Ecuador. E-mail: luciatocco@gmail.com ORCID: <https://orcid.org/0009-0004-2041-7388>

**** Magíster en Matemática mención Modelación y Docencia. Magíster en Gestión de Operaciones. Ingeniero Mecánico. Docente en la Escuela Superior Politécnica de Chimborazo, Sede Morona Santiago, Ecuador. E-mail: fabian.allauca@epoch.edu.ec ORCID: <https://orcid.org/0000-0001-7668-3053>

Evaluación de las matemáticas y desarrollo de habilidades para el ingreso a la educación superior ecuatoriana

Resumen

El ingreso a la educación superior en Ecuador requiere un conjunto de habilidades sociocognitivas que deben ser impulsadas desde el sistema educativo secundario, por lo cual, es fundamental guiar los procesos pedagógicos en ese nivel. Así, el objetivo de este artículo es describir las estrategias pedagógicas que propician el fortalecimiento de las competencias matemáticas en el nivel secundario ecuatoriano como factor determinante para mejorar las oportunidades de acceso, permanencia y éxito académico de los estudiantes en la educación superior, especialmente en áreas científicas, tecnológicas e ingenieriles. Metodológicamente se desarrolló un análisis crítico hermenéutico de artículos científicos, en bases de datos como Scopus, WoS, Scielo, Dialnet y Google Scholar, donde se enfatiza la necesidad de promover metodologías activas para la evaluación de las matemáticas. Se evidenció como resultado que, la evaluación de las matemáticas constituye uno de esos elementos fundamentales para potenciar las posibilidades de los alumnos de bachillerato a la hora de acceder y tener éxito en los estudios universitarios. Siendo así, se concluye que en Ecuador la evaluación matemática en la educación secundaria se orienta hacia el desarrollo de competencias más que a la simple memorización de contenidos, promoviendo la capacidad del estudiante para interpretar, modelar y resolver situaciones problemáticas en diversos contextos.

Palabras clave: Evaluación matemática; admisión a la educación superior, nivel de educación secundaria, pensamiento crítico, pensamiento abstracto.

Introduction

University studies represent, in any nation, the space best suited to consolidating the human talent that drives, or makes possible, the various plans for socio-economic development, in conjunction with other structural policies, whether in the industrial or technological spheres. In most Latin American countries, higher education is regarded not only as the final stage of academic training before entering the world of work, but also as the main engine of social transformation and social mobility, amid the social inequality that permeates the entire region.

In this sense, there is a certain consensus among authors when considering the need these countries have to strengthen quality education at all levels, but even more so at university, since “higher education, universities and university members have been guarantors that society, in general, obtains the benefits derived

from productive research, whether directly or through social programmes” (Montaño, 2022, p. 80). It is the final step in a process of shaping and integrating the professional competencies developed throughout the preceding educational levels, each with its own function but sharing the same teleological task as the areas that compose them.

In Ecuador, higher education represents a crucial stage in completing the sequential nature of students’ formative process, marking the transition from basic or general knowledge to specific or specialized competencies (Castillo et al., 2025). In general, the assessment of mathematics plays a fundamental role, not only as a tool for measuring acquired knowledge but also as a means of developing the cognitive skills essential for academic success at university. In this way, assessing mathematical learning and fostering the development of specific skills for admission to higher education is a challenge

that requires the attention of specialists, not only in the field of mathematics but also in assessment methods, pedagogical approaches and their relationship with university selection processes.

The current reality invites a deeper examination of the factors that favor or hinder Ecuadorian students' admission to the higher education system, with particular attention to critical areas, such as mathematics, that often pose barriers to students who aspire to continue their studies after completing secondary school. Considering the arguments put forward by Cárdenas-Oliveros et al. (2022); and Angulo et al. (2025), it can be said that, nowadays, the development of mathematical skills goes beyond the mere memorization or repetitive practice of formulae. It involves cultivating analytical capacities, critical thinking, data interpretation and mathematical modeling; aptitudes that are indispensable for succeeding in higher education.

That said, in Ecuadorian basic and intermediate education, the curricula often fail to align pedagogical activities sufficiently with these competencies, thereby limiting the real preparation of prospective university students. By contrast, countries with better results in international tests such as the Program for International Student Assessment (PISA) implement integrated programs that link mathematics with real and technological contexts, favoring meaningful and functional learning (Bauz et al., 2024). Indeed, preparing upper-secondary students through the development of strategies based on logical-mathematical thinking can consolidate a comprehensive education that would project, from that level, a successful university profile.

Nevertheless, the social inequality gap that persists in Ecuador reproduces a socio-educational environment that impedes equitable access to quality general education, especially in mathematics. Thus, students from rural areas or with fewer resources face difficulties in developing advanced skills, as reflected in their results on admission assessments (Salgado, 2025). Seen in this way,

the contrast makes it evident that, to optimize the development of logical thinking and assessment in this area with a view to access to higher studies, Ecuador must implement strategies to reduce that gap.

In this regard, various studies indicate significant gaps in mathematical learning at the secondary education level, negatively affecting the inclusion and retention of young people in higher studies within the Ecuadorian context (Delgado et al., 2023; Stefos & Chávez, 2023; Bolaños et al., 2025). It is understood that, in general terms, the transition from secondary education to university represents a critical moment in students' academic trajectory, since the education they receive at the intermediate level not only influences their immediate performance, but also lays the foundations for their success in gaining admission to and progressing through higher studies.

In this sense, the pedagogical strategies implemented in upper-secondary education play a fundamental role in facilitating that transition and ensuring that students develop the competencies necessary to face the challenges of university. According to Gutiérrez-Pingo et al. (2023); and Pérez (2025), certain pedagogical strategies in secondary education, such as active learning, the development of metacognitive skills and socio-emotional guidance, are intrinsically linked to academic success at university, contributing to the formation of autonomous, resilient and critical students.

It is also necessary to consider certain elements related to the integration of new technologies into the teaching and assessment of mathematics, which represent differentiating devices in the preparation for higher education. Digital tools, interactive software and virtual learning platforms are among the novel elements that enable diversification of teaching and the response to diverse cognitive styles, with a view to upper-secondary graduates' admission to the country's various universities (Lima-Ribas & Tobar-Naranjo, 2021; Quiñones & Huiman, 2022; Núñez et al., 2024; Ramos et al., 2026).

In this sense, the Ecuadorian education system still lags behind countries that have widely incorporated these resources, thereby facilitating continuous and personalized assessment that enhances the development of skills and competencies among students aspiring to continue their studies and enter the nation's universities. Regarding digital competencies, Lema et al. (2023); and Villalobos et al. (2023) states that technological modernization, along with continuous teacher training, is indispensable for adapting the assessment system and mathematical education to current demands.

In sum, analyzing the characteristics of the assessment of mathematics and the development of skills for admission to higher education in Ecuador is a complex task that requires a comprehensive approach that considers both successful international experiences and local particularities. From a complexity standpoint, the move from upper-secondary education to higher studies is not a mere sequential formality but a qualitative transition from exclusively summative tests at the upper-secondary level to formative and inclusive assessments characteristic of university pedagogy.

Taking these ideas as a starting point, this article analyses, from a holistic perspective, the pedagogical strategies that strengthen mathematical competencies in students at the Ecuadorian secondary level, recognizing their fundamental role as a determining factor for improving the opportunities for access, retention and academic success in higher education, especially in areas linked to the sciences, technology and engineering. Methodologically, the article is developed from a holistic conception of the assessment of mathematics at the secondary level in Ecuador, grounded in a critical hermeneutic analysis of the scientific production on the subject, drawn from databases such as Scopus, WoS, SciELO, Dialnet and Google Scholar.

1. Theoretical foundation

1.1. The development of students' skills for admission to higher education in Ecuador

The transition from the completion of upper-secondary education to admission to higher education is a critical juncture in consolidating a set of traits that enable students to shape their abilities, at the socio-affective level as well as the emotional and cognitive levels. It is a period for consolidating, in a comprehensive way, what students have built up to that point, since upon completing secondary school, the majority already have a clearer sense of their expectations and their own potential. As González (2020) states, "In every move from one educational level to another, the student will experience different teaching cultures with objectives, activities and teaching styles that are new to them" (p. 156).

That move from secondary school to university represents, in Ecuador, a crucial milestone in students' academic trajectory, as it marks the transition to a formative stage that demands not only specific knowledge but also a set of skills that facilitate autonomous learning, adaptation to new educational environments, and academic success. In this context, for the development of a new academic culture, the competencies that emerge during secondary education are fundamental for preparing future university students and ensuring their effective integration into higher education institutions.

Although it is a complex subject, among the competencies that the start of higher education demands, the basic cognitive skills stand out, such as reading comprehension, logical-mathematical reasoning and the capacity for critical analysis, since they constitute the indispensable basis for students to be able to access and operate within the university sphere (Ortega & Mendoza, 2025). These skills enable interpreting complex texts, solving abstract problems and evaluating

information from multiple perspectives, competencies that are usually required in university selection processes in Ecuador, as well as in the internal tests implemented by some higher education institutions.

However, various studies show that many applicants present deficiencies in areas that limit their possibilities of access to and retention within higher education institutions (Álvarez-Pérez & López-Aguilar, 2020; Zambrano & Mayo, 2023; Moreira & Michay, 2025). Among the skills that must be enhanced in secondary education for a more assertive transition of students to higher levels are soft skills. "This entails starting from the principle according to which a professional is only complete insofar as they are capable of carrying out tasks such as effective communication, recursive interaction and teamwork" (Santillán et al., 2025, p. 380).

It is along these lines that Mendivil et al. (2023); Bravo-Cedeño et al. (2024); and Morales & Buendía (2025) extol the importance of socio-emotional skills, considering that many students fail in their university studies because they have shortcomings in their capacities for self-discipline, resilience, time management and teamwork, which are essential attributes for facing the academic workload and the social demands of university. According to these authors, the lack of comprehensive programs that strengthen these skills from basic and intermediate education contributes to numerous students entering university without the emotional tools to maintain their performance and adapt to new environments.

Likewise, there is a consensus regarding the role of the development of critical thinking and digital competencies in consolidating research and student autonomy in the adaptation that the university context demands of students who seek to remain within the system (Ortiz et al., 2025; Gonzales et al., 2025). In addition, digital skills are indispensable given the technological advances and the growing presence of virtual and blended modalities in the university educational offer. In Ecuador, although there have been efforts to integrate

technology into education, significant gaps persist in access to devices and connectivity, as well as in training for the effective use of digital resources. This reality puts certain groups of students at a disadvantage when entering higher education, where the handling of virtual platforms, the search for information on the internet and digital production are increasingly in demand.

1.2. Logical-mathematical reasoning as a determinant for admission to Ecuadorian higher education

On the other hand, as in other Latin American countries, in Ecuador, various criteria have been established for selecting students who gain access to higher education centers. Among these criteria, logical-mathematical reasoning appears to be one of the determinants that causes the greatest difficulties among students, and, for this reason, it is necessary for those who study the subject to pause to analyze this skill. As Cuenca (2024) states, the assessment of logical-mathematical reasoning is a valid and necessary tool for guaranteeing academic quality and equity in access to Ecuadorian higher education, provided that it is implemented with appropriate criteria and accompanied by inclusive policies.

As regards the relevance of logical thinking skills, this type of reasoning involves the capacity to analyze problems, establish relationships, deduce conclusions and solve complex situations in a structured manner. These skills are fundamental not only in careers directly related to the exact sciences and engineering, but also in social and humanistic disciplines that require critical and structured thinking. Therefore, according to Álvarez et al. (2024), assessing this competency enables anticipating students' academic performance, ensuring that those who enter possess an adequate cognitive base to face the challenges of university.

The development of logical-mathematical reasoning as a pivot for promoting students' admission to the university

system fosters intellectual autonomy and analytical capacity, key competencies for training proactive and creative professionals. According to Cristiá (2023), the university should not be merely a space for acquiring technical knowledge, but also an environment for developing the skills that enable students to adapt to a changing world that continually presents complex problems, before which they must demonstrate their capacity to think logically.

All in all, beyond the selection process, logical-mathematical reasoning is a key tool for facing the academic challenges at the higher level, which usually demand structured thinking, rigorous analysis and the capacity to solve complex problems that transcend mere memorization (Laz et al., 2023; Borbor et al., 2025). These attributes are intrinsically related to the mastery of logical-mathematical skills, which boost students' capacity to understand and synthesize information, formulate hypotheses and construct coherent arguments, strengthening adaptation to the university environment and contributing to reducing school dropout, a recurring problem in Ecuadorian higher education.

1.3. Other skills related to logical-mathematical reasoning that facilitate admission to Ecuadorian higher education

Although the development and continuous assessment of mathematics are important in preparing upper-secondary graduates for university admission, other related competencies must be considered by intermediate-education teachers to support the profile students require at that higher level. Problem-Based Learning (PBL) strategies, for example, by engaging active, context-based cognitive processes, significantly strengthen logical-mathematical thinking among students who go on to university, helping them overcome the limitations of traditional secondary-school methods that prioritize memorization over critical reflection (Pedraja-

Rejas & Rodríguez, 2023; Rea et al., 2026).

More specifically, being a student-centered methodology, PBL represents a dynamic process that stimulates the development of high-level cognitive strategies, such as the identification and organization of relevant data, the formulation of hypotheses, the establishment of causal relationships and the elaboration of well-founded conclusions. In the field of mathematics, these skills are intrinsic to logical thinking for carrying out tasks related to the ordering of facts, the recognition of patterns, the inference of results from patterns, and the verification of the validity of procedures.

On the other hand, some authors recommend the use of didactic strategies, such as the flipped classroom, as an active methodology that improves students' capacity for logical reasoning prior to admission to a university degree program (López et al., 2025; Peña et al., 2025). Among the contributions recognized in this strategy is the fostering of autonomy, a vital competency for higher education, in which the teacher no longer "dictates" the subject matter but rather facilitates learning while intervening as little as possible, because the leading role must fall to the students.

According to the arguments of Condor-Campos et al. (2026), "The flipped classroom model revolutionises conventional instruction by placing the emphasis on the student, who takes on a more active and independent role in the learning process" (p. 3). That independence or autonomy for learning that students develop is an indispensable skill for promoting a faster and more pertinent access of recently graduated upper-secondary students to the country's universities, and, at the same time, it projects a profile that entails the capacity to analyze, establish relationships and construct coherent arguments based on logical-mathematical principles.

Chero-Santiesteban et al. (2025), in assessing the use of the flipped classroom in preparing prospective university students, consider that this tool facilitates logical thinking because it makes it possible for

students to arrive at classes prepared with a solid conceptual basis, which broadens the opportunities for the teacher to guide processes of critical reasoning. For example, through discussions of complex problems or the execution of collaborative projects, students exercise deductive and inductive reasoning, strengthening their autonomy and creativity in handling mathematical concepts and opening up spaces for immediate classroom feedback, which contributes to correcting conceptual errors and consolidating learning.

Nevertheless, implementing the flipped classroom presents certain challenges that must be considered to ensure its effectiveness in developing logical-mathematical thinking, particularly when it is undertaken with a view to strengthening opportunities for admission to higher education. On this point, Fernández et al. (2025) argue that, for the strategy to be successful, it is essential that in-person activities be carefully planned to maximize time for interaction and analysis, preventing them from becoming merely spaces for superficial review. Thus, it is indispensable to generate institutional policies that support the integration of this methodology with an appropriate formative and evaluative approach.

In any case, this article is grounded in a hermeneutic and critical reading of the strategies that various authors have developed regarding the need to prioritize the assessment of mathematics and the development of logical thinking in the context of the secondary level, as fundamental skills for expanding students' strengths in the face of admission to Ecuadorian higher education. It is an analytical exercise that seeks to provide a comprehensive overview that demystifies, on the one hand, the inhibition some upper-secondary students experience in the face of logical-mathematical thinking and in its assessment with a view to university.

2. Methodology

In its epistemological conception,

the article follows a qualitative and holistic perspective, on the understanding that it deals with a complex subject which, as Torres & Blanco (2021) point out, warrants a flexible approach, oriented towards understanding in depth the experiences, perceptions and meanings that individuals attribute to their reality and, in this case, the importance of the strategies for fostering logical-mathematical thinking in secondary school. The qualitative outlook responds to the intention of interpreting the meaning of pedagogical action as it strives to prepare students' minds to discern the value of being educated and to go beyond the superficial features of social reality.

Unlike quantitative methodology, which is based on measurement and numerical data, this perspective interprets textual content to capture the richness and diversity of social contexts and to identify ways to improve formative strategies to drive change in the transitional dynamic between secondary school and university in the country. From a critical standpoint, these characteristics offer evident advantages. Methodological flexibility helps avoid simplistic or biased conclusions, promoting a more complete and nuanced understanding, given that, in the social sciences, the objects of study tend to be intrinsically complex and multidimensional (Salazar-Escorcia, 2020).

Operationally, the methodological processes involved an in-depth search of sites that compile scientific research products, such as Scopus, Scielo, Dialnet and Google Scholar. Likewise, some repositories of Ecuadorian universities were examined, as were official information sites on the transition processes between secondary education and university studies in the country. The search strategy was guided by key terms derived from the general objective, such as: mathematics assessment, admission to higher education, secondary educational level, critical thinking and abstract thinking.

Similarly, the documentary screening was carried out using, as criteria for acceptance or rejection, the geotemporal quality of the various articles, taking as pertinent those

authors whose intellectual production is situated in Latin America, preferably in Ecuador, and within the time period running from 2018 to 2026, since this represents a span sufficiently current for a subject that is, in itself, quite changeable. Another criterion was thematic specificity, that is, articles concerning the connection between the assessment of mathematics and the development of skills for admission to Ecuadorian higher education.

3. Results and discussion

In principle, the general search across the various sites that gather specialized information generated a considerable number of articles, which were organized quantitatively by search engine, without any pre-selection, guided only by titles and keywords. Thus, Table 1 presents these first results.

Table 1
The number of documents located by the search engine and the keyword

Search engine	Keywords	Acceptance or rejection criteria	Total number of files found	Number of documents selected after the hermeneutic screening
Google Scholar, Scopus, Dialnet, Scielo	Mathematics assessment; Admission to higher education; Transition between the secondary and university educational levels; Critical thinking and abstract thinking.	Geotemporal quality; Level of currency	175	35

Source: Own elaboration, 2026.

From a generalizing perspective, the literature found that both intellectuals and various institutional actors in the socio-educational reality in Ecuador consider it a constant concern for higher education to ensure that upper-secondary students possess the competencies necessary to successfully face university academic programs. In this context, among the results, some authors stand out by categories that are analytically differentiated in this part of the research.

García & Valarezo (2023), for example, develop their ideas around the assessment of mathematics and the development of skills, noting that it plays a fundamental role in the preparation and selection of students aspiring to pursue studies at higher education institutions. In their research, the aim is to “analyse the learning outcomes and associate them with the assessment systems and, in that way, to find effectively the methods that allowed students to obtain the learning” (p. 369).

With regard to that same category, there

are the articles by Villamizar et al. (2020); Gutiérrez et al. (2025); and Ochoa et al. (2025), which delve into the need that secondary-level teachers have to articulate their pedagogical strategies with the guidance that students will require for their admission to, and successful retention within, the various universities. For these authors, systematic assessment in mathematics enables identification not only of students’ knowledge levels but also of their skills in applying mathematical concepts to real-world problems.

As regards the development of skills for admission to higher education in Ecuador, Piñas-Morales et al. (2022) and Haro-Oña et al. (2023) share the argument concerning the need to start from the conviction that the Ecuadorian education system presents structural gaps that affect students’ performance in university admission processes and, from there, to tackle the factors that deepen that gap. This idea is shared by other authors such as Poveda-Pineda & Cifuentes-Medina (2020); Padilla

& Ayala (2021); and Villavicencio-Chancay et al. (2023), who add that, in closing the gap between the completion of upper-secondary education and admission to higher education, it is also necessary to attend to the digital literacy of upper-secondary students.

Regarding the category on the relevance of teaching strategies that encourage critical and abstract thinking as leverage for admission to Ecuadorian higher education, Table 2 summarises the arguments of some authors on this subject.

Table 2
Summary of authors and their arguments on teaching strategies that encourage critical thinking and abstract thinking

Author(s) and Year	Title	Relevant findings regarding the article's topic
Cabascango (2025)	Critical thinking in university students through the analysis of historical debates in Ecuador	Integrates and suggests a set of strategies to foster critical thinking for understanding the processes of change that university entails
Antón et al. (2024)	Critical thinking in university higher education	Analyses the level of critical thinking in university students, projecting strategies that can be implemented
López-López & Gómez-Hernández (2022)	Critical thinking in university students at a private university	Carries out an analytical exercise that weighs up the pedagogical means for enhancing critical thinking at university
López et al. (2022)	Disposition towards critical thinking in university students	Highlights the relationship between the disposition towards critical thinking and the performance perceived by teachers
Amaya & De Cleves (2024)	Development of critical thinking in university students	Recommends tasks that can stimulate critical thinking and the capacity for abstraction
López et al. (2021)	The development of critical thinking in the classroom: testimonies of outstanding Ecuadorian teachers.	Teachers in Ecuador use strategies and activities aimed at students' self-regulation
García et al. (2025)	Metacognitive strategies and critical thinking in university students	Fosters confidence and familiarity with rhetorical structures
Baloa & Navas (2024)	Development of critical thinking in higher education: challenges and effective strategies	Proposes strategies based on collaborative learning, critical reflection and the integration of educational technologies to foster critical thinking
Zúñiga (2025)	Active methodologies for the development of critical thinking at university. A literature review	Develops a general review that revalues active methodologies in promoting critical thinking
Cangalaya (2020)	Critical thinking skills in university students through research. Desde el Sur	Argues that research at university enables the student to develop the characteristics of a critical thinker.

Source: Own elaboration, 2026.

The documentary hermeneutics, summarised in Table 2, shows that the authors recognize a significant quantitative and qualitative gap between those who complete upper-secondary education and those who enter higher education. In addition, a more detailed reading of the documents reviewed finds agreement in the insistence according to

which limiting oneself to preparing applicants exclusively for standardized tests is insufficient and counterproductive, since a comprehensive education is required that enhances analytical capacities, creativity and autonomy, allowing young people to adapt to more complex and demanding university methodologies.

In this sense, it is not solely a matter

of reinforcing and assessing logical-mathematical thinking, but of promoting educational integrality from the earliest levels so that upper-secondary graduates develop the competencies they will require to enter and succeed at university. The documentary hermeneutics carried out highlights other necessary skills, such as communicative and socio-emotional capacities, while the competencies in emotional intelligence, resilience and teamwork contribute to adaptation to the university environment, favoring persistence and reducing the risk of dropout.

Conclusions

The panorama revealed throughout this text shows that the issue of admission to higher education in Ecuador goes beyond the transformation of the tests or the schemes for selecting applicants, since, in attempting to describe the pedagogical strategies that foster the strengthening of mathematical competencies at the Ecuadorian secondary level, it has been possible to demonstrate that, parallel to that need, students require the enhancement of the competencies relating to emotional intelligence and the capacity for resilience, to mention only two other important skills.

Likewise, it has been possible to verify a marked tendency to devote greater attention to the implementation of public policies oriented towards inclusion and equity as guiding principles, given Ecuador's socio-economic and geographical diversity. That diversity implies that many young people face additional barriers, such as resource limitations, unequal access to technology and a lack of adequate vocational guidance, circumstances that can aggravate the imbalance between graduation from upper-secondary education and admission to the university system.

Now, with regard to the specificity of the pedagogical strategies suggested by the literature analyzed concerning the strengthening of mathematical competencies at the Ecuadorian secondary level in order to

improve students' opportunities for access, retention and academic success in higher education, there is a certain consensus about the need to promote active methodologies through which students can appreciate the relevance that mathematics has in boosting the capacity for abstraction.

Regarding this last point, one of the contributions of this research is the reframing of strategies based on the active participation of both students and teachers in the various learning dynamics developed in upper-secondary classrooms. The intention is that the protagonists of educational processes, regardless of their position, commit themselves to fulfilling complementary roles that strengthen the projection of education at various levels.

Abstract thinking thus represents an added value in the teaching and assessment of mathematics, strengthening the synergy between the different educational levels; therefore, rather than imposing a particular type of thinking, it is essential to design flexible, accessible and contextualized programs that respond to the specific needs of each community. Initiatives such as personalized tutoring, leveling courses and the use of digital platforms can democratize preparation opportunities, reducing existing gaps and ensuring that potential talent is not excluded by external factors.

In the future, it is important for researchers to delve deeper into the description and proposal of new strategies that clarify students' opportunities for facing the move to university with greater clarity about their vocation and the professional training that best suits them. Likewise, it is important for researchers to develop new approaches to the subject addressed here, using holistic methods that provide a comprehensive overview of the various problems education faces.

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