

Methodological strategies to reinforce the teaching of mathematics in the baccalaureate in science at the Isabel de Godin Educational Unit

Estrategias metodológicas para reforzar la enseñanza de la matemática en el bachillerato en ciencias de la Unidad Educativa Isabel de Godin

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ABSTRACT

The Ministry of Education of Ecuador, considering that the quality of education is in line with the competencies of the 21st century, implements four interdisciplinary competencies: communicational, mathematical, socioemotional and digital, through which it aims to improve teaching in a comprehensive manner. This article shows the review of literature related to the methodological strategies to reinforce the teaching of mathematics, considering developmental thinking. The 21st century skills, which transform traditional teaching methods, are coupled to these competencies. A bibliographic research considers several sources related to the proposed objectives, the scientific method is considered and a participative observation, which allows to know in a direct way the information for its study.

Keywords: Strategies - teaching - reinforcement

RESUMEN

El Ministerio de Educación del Ecuador, considerando que la calidad de la educación, este acorde a las competencias del siglo 21, implementa de forma interdisciplinar cuatro competencias, la comunicacional, matemática, socioemocional y digital, mediante las cuales pretende mejorar la enseñanza de forma integral. El presente artículo muestra la revisión de literatura relacionada a las estrategias metodológicas para reforzar la enseñanza de la matemática, considerando el pensamiento desarrollador.

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Se acopla a dichas competencias las habilidades del siglo 21, las cuales transforman los métodos tradicionales de enseñanza. Una investigación bibliográfica considera varias fuentes relacionadas a los objetivos propuestos, se considera el método científico y una observación participativa, que permite conocer de forma directa la información para su estudio.

Palabras clave: Estrategias - enseñanza - refuerzo

INTRODUCTION

Currently, the Ministry of Education of Ecuador (MinEduc) is aware of the needs and shortcomings that students present at the end of secondary education, and it is necessary to adapt its curriculum, whose purpose is to provide the individual with a coherent and participatory participation and to make them active entities in the society of today's world.

The mathematics teacher at the Isabel de Godin Educational Unit in the city of Riobamba must adapt to changes and transformations, which leads to the implementation of new strategies to improve the teaching of the subject, applying certain competencies in an interdisciplinary manner.

According to Vivas (2018), "Mathematics has provided, and does provide, the tools necessary to develop the scientific and technological applications that have made our current technological civilization possible" (p.68). (Giler-Velásquez, 2020).. The use of technological competence then plays a preponderant role in the teaching of mathematics, through the use of simulations and educational software, providing the student with a tool for testing and manipulation through analysis, synthesis and the development of creative thinking.

It is important to emphasize that the teaching of mathematics should begin with a brief motivating introduction, thus awakening the interest and performance of the students, without leaving aside their previous knowledge, personal intuition and learning methods known to them as a result of their intra- and extra-mathematical socialization process (Mora, 2002). As teachers we must consider that at present, we have several resources, ideas and means that serve to promote and initiate mathematical activities with our students, and we must put them into practice to improve the educational activity day by day (Mora, 2003).(Mora, 2003).

In order to improve the teaching and learning standards of Ecuadorian education, the MinEduc in the year 2021, submits a new curriculum, a document focused on meeting the needs of the current educational reality, prioritizing skills focused on the development of priority competencies for life. Among them we have the communicational, mathematical, digital and socioemotional. The first competence allows social interaction, reading comprehension and text production; the second emphasizes the development of rational logical thinking; the third promotes the responsible use of

technology and encourages computational thinking, and the fourth competence allows them to carry out a life project focused on the challenges and purposes of today's society. The aforementioned will allow the integral development of students, providing them with the capacity to solve diverse daily situations, strengthening and consolidating the continuity of learning and the educational quality of the country.(Ministry of Education, 2021). The role of the mathematics teacher at the high school level is important and fundamental for students to achieve interdisciplinary learning, considering the development of the evaluation indicators proposed by the prioritized curriculum with its four competencies.

Through methodological strategies, criteria, principles and procedures can be identified, where teaching, learning and the teachers' way of acting are established. It is essential that at the beginning of the classes, the teacher asks the students about the purpose of learning the subject of study, encouraging them to participate by establishing objectives for the class or unit, suggesting strategies and procedures. The various teaching techniques or strategies serve to guide and direct learning towards the desired results, proceeding in an intelligent and orderly manner to achieve the increase of knowledge.(Gordón et al., 2022)..

MATERIALS AND METHODS

The purpose of the literature review was to explore the existing literature about methodological strategies to strengthen the process of teaching mathematics, at the high school level, describing what have been the foundations used for the purpose of the research, the impact it generates and establish what are the perspectives and challenges that are presented in this field from the point of view of the different actors involved in the process (students, teachers, educational institutions and governmental bodies).(Grisales Aguirre, 2018).

In reference to the methodology, the work was organized under two criteria: first, an inspection was made of the articles related under the established delimiters, using the following online databases: Dialnet, Scielo, Science Direct and Redalyc. Then, the references found were reviewed in order to discover the related topics, define the categories of analysis and review the references to other authors whose works are related to the search objective.(Grisales Aguirre, 2018).

According to López-Quijano (2014), it is stated that "Today's student needs learning environments different from the traditional ones, which constantly motivate him/her to the construction of mathematical knowledge, which are in line with technological and social changes" (p. 73). (Gordón et al., 2022).. Under this criterion, the Skills with Performance Criteria (DCD) of the subject of mathematics will be reinforced, which are included in the prioritized curriculum with emphasis on the four competencies, the same that are in accordance with technological progress and the criteria of the Program for International Student Assessment (PISA), so that students become aware of the fundamental role that mathematics plays at the local, national and international level, so

they can make decisions and value judgments, which will allow them to be constructive, committed and reflective citizens of the 21st century.

It is important to mention that there is currently interest in the 21st century skills proposed by the Organization for Economic Cooperation and Development (OECD), whose project has as its specific objective what the curriculum could be like in the future, focusing initially on mathematics.(PISA 2022, n. f.).

The following is a list of the key skills of the 21st century, which can be added to the communicational, mathematical, digital and socioemotional competencies, which will help to reinforce the methodological strategies in the teaching of mathematics:

- critical thinking
- creativity
- research and inquiry
- self-direction, initiative and perseverance
- use of information
- systems thinking
- communication; and
- reflection.

The above can be framed within the framework of Developmental Thinking, based on developmental learning, which occurs throughout life. For several authors, developmental learning is based on the assertion that it is up to the student to assume a leading role in the learning process from the construction and reconstruction of their knowledge (Bastart Ortiz, Reyes Mediaceja, & Gonzalez Gilart, 2013; Encarnacion, 2013; Lopez Fernandez et al., 2012).(Kanhime Kasabube & González Hernández, 2016)..

RESULTS

The role of the teacher today is to help educate oneself, considering that students should be the generators of their own knowledge, while teachers are the facilitators of this process. All techniques and strategies must be present in the educational activity, not only to teach disciplinary and interdisciplinary contents, but we teach people how to educate themselves, using the best tools, in our context the four fundamental competencies of the 21st century. (Pérez Gómez, 2012)

Through developmental learning we will transform and improve education and especially the teaching of mathematics, developing competencies (communicational-linguistic, logical-mathematical and socio-emotional), in the high school in science of the Isabel de Godin Educational Unit.

Through educational transformation we will promote a fairer, freer society with opportunities for all, so we must know what the benefits of education are. (MinEduc 2023, s. f.)

- Learning improvement
- Inclusive education
- Curricular transformation
- Relevance of the resources for learning

- Teacher training
 - Digital transformation
 - Contextualized and quality education
- Foundational learnings

DISCUSSION

Aware that education is a complex task, the teacher must be creative and encourage the student to research, discovery and not memorization according to their interests and the environment where the educational activity takes place. Being the teaching methods a fundamental pillar where the teacher and the student have an active participation in the development of the educational activity, we hope to develop in the students their degree of participation and creativity, in order to reinforce the teaching of mathematics.

Teachers, as the main actors in the school, must take advantage of all resources and materials to foster curiosity for research in our students.

Methodological strategies based on developmental thinking will favor learning and at the same time improve reinforcement in the teaching of mathematics at the high school level, based on the four competencies currently proposed by the Ministry of Education.

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