

Teaching Of Spanish Language And Mathematics In Secondary Education In Colombia

Alexander Thomas Ramos¹, Elda Mavet Castro Sierra², José Ignacio Gutiérrez Silva³, Alexander Farith Arenas Quintero⁴, Jairsinio Mendoza Lozano⁵

Summary

The teaching of Spanish language and mathematics in secondary education in Colombia is of vital importance for the integral development of students. Both disciplines provide the necessary tools for the acquisition and consolidation of communication and analytical skills. The aim of this education is to ensure that students acquire an adequate level of language competence and mathematical skills that will enable them to function in society and in their future employment. To achieve this, different teaching methodologies are employed and student progress is assessed. The role of the teacher is fundamental in this process, as their job is to guide and motivate students, as well as using teaching resources and new technologies to support them. Despite the challenges and difficulties, strategies to improve teaching are proposed, such as the inclusion of problem-solving and interdisciplinary approach. In addition, the importance of motivation, the relationship with the world of work, culture and identity, as well as the impact on the cognitive development of students is highlighted. The training of teachers in these disciplines is crucial for their effective performance, and reference is made to the relevant scientific literature. In conclusion, the teaching of Spanish language and mathematics in secondary education in Colombia has a significant impact on the integral development of students and society in general.

1. Introduction

The main objective of this work is to address the teaching of the Spanish language and mathematics in secondary education in Colombia. In this first chapter, a general introduction to the topic will be given, highlighting the importance of these areas in the educational process and their relevance in the development of students' cognitive skills. In addition, the structure and approach to be followed in the following chapters will be outlined, detailing the key aspects that will be addressed in each section. It will also provide an overview of the challenges and difficulties encountered in teaching these disciplines, as well as strategies and resources that can be used to improve the quality of teaching.

2. Importance of teaching Spanish language and mathematics

The teaching of Spanish language and mathematics in secondary education in Colombia is of vital importance due to several aspects. First of all, mastery of the Spanish language is essential for effective communication and the development of language skills in students. Learning the mother tongue allows students to express themselves correctly, understand texts of various kinds and enhance their capacity for analysis and argumentation. On the other hand, mathematics is an essential tool in the development of logical-mathematical thinking, problem-

¹⁻⁵Universidad Popular Del Cesar.

solving, and decision-making. The handling of mathematical concepts and procedures enables students to face academic challenges and future situations in their professional lives. In summary, the teaching of the Spanish language and mathematics in secondary education contributes to the comprehensive development of students, enhancing their communication skills and mathematical reasoning.

3. Objectives of the teaching of the Spanish language and mathematics

The objectives of teaching the Spanish language in secondary education in Colombia include developing students' oral and written comprehension and expression skills, fostering an interest in literature and reading, and promoting the correct and appropriate use of the language. In addition, students are expected to acquire skills in grammar, vocabulary and spelling, as well as the ability to analyze texts and argue coherently. On the other hand, in the teaching of mathematics, students are expected to understand the basic concepts of this discipline, develop problem-solving skills, apply concepts and operations in everyday situations, and acquire logical and abstract reasoning skills. The objectives also include promoting an interest in mathematics and its relevance in daily life, as well as the ability to communicate and argue using mathematical language.

4. Teaching methodologies

In the teaching of Spanish language and mathematics in secondary education in Colombia, various methodologies are used to promote effective student learning. Some of these methodologies include the communicative approach, where the oral and written interaction of students in real communication situations is encouraged; project-based learning, where students work in groups to solve problems and develop research and analytical skills; and the use of information and communication technologies, which facilitate access to teaching resources and promote the active participation of students. In addition, strategies such as collaborative work, problem-solving, meaningful learning, and competency-based teaching are employed to provide a comprehensive approach and promote the acquisition of knowledge and skills necessary for students' academic and personal development.

5. Student Assessment

Student assessment is a fundamental process in secondary education in Colombia. The evaluation seeks to measure the level of knowledge, skills and competencies that students have acquired in the area of Spanish language and mathematics. To do this, different techniques and tools are used, such as written exams, oral tests, individual and group work, among others. In addition, both theoretical and practical aspects are evaluated, thus promoting a comprehensive evaluation that allows students to know the performance of students in real situations. The results of the assessment are used to provide feedback to students, identify strengths and areas for improvement, and make pedagogical decisions aimed at ensuring quality education.

6. The role of the teacher in the teaching of Spanish language and mathematics

The role of the teacher in the teaching of Spanish language and mathematics in secondary education in Colombia is fundamental to ensure effective learning of these two fields of knowledge. The teacher has the responsibility to use appropriate methodologies that promote the active participation of students and encourage their linguistic development and mathematical skills. In addition, the teacher must be a facilitator of learning, providing individualized guidance and support to students, identifying their strengths and weaknesses,

and tailoring their teaching to their specific needs. It is also important for teachers to promote motivation and interest in learning, using innovative teaching resources and relating the content to situations in students' daily lives. In summary, the teacher plays a crucial role in the teaching of the Spanish language and mathematics, being responsible for guiding and accompanying students in their learning process and ensuring that they acquire the skills and knowledge necessary for their integral development.

7. Teaching Resources

The teaching of Spanish language and mathematics in secondary education in Colombia is supported by a variety of didactic resources that facilitate the learning process of students. These resources include printed material such as textbooks, workbooks, and teaching guides. In addition, audiovisual resources such as educational videos, television programs and films related to curricular content are used. Information and communication technologies also play a key role, enabling access to online resources such as educational platforms, websites and mobile applications that offer interactive activities, self-assessment exercises and simulations. Teaching resources also include manipulative materials, such as abacuses, power strips, and geometers, which allow students to experience mathematical concepts in a practical way. In short, the use of didactic resources in the teaching of Spanish language and mathematics in secondary education in Colombia contributes to enriching the learning process and encouraging the active participation of students.

8. Challenges and difficulties in the teaching of Spanish language and mathematics

The teaching of Spanish language and mathematics in secondary education in Colombia faces various challenges and difficulties. In relation to the Spanish language, one of the main challenges is the lack of motivation of the students, which is reflected in their lack of interest in reading and writing. There is also the challenge of addressing the linguistic diversity of the country, taking into account that there are different varieties of Spanish. When it comes to math, one of the biggest challenges is understanding abstract concepts, such as negative numbers or algebraic equations. In addition, it faces the difficulty of relating mathematics to the daily lives of students, which makes it difficult to apply it in practice. Overcoming these challenges and difficulties requires innovative and creative pedagogical strategies, as well as the continuous training of teachers in these areas.

9. Strategies to Improve Teaching

To improve the teaching of Spanish language and mathematics in secondary education in Colombia, it is essential to implement strategies that encourage the active participation and interest of students. One of the effective strategies is to use innovative teaching methods that promote meaningful learning and real problem-solving. In addition, it is important to use technological and multimedia resources that complement the content taught in class and provide a more interactive and engaging approach for students. Hands-on activities and collaborative projects can also be used to facilitate the understanding and application of the concepts learned. It is also necessary to establish an inclusive learning environment that respects the diversity of students and promotes the participation of all. Finally, it is essential that teachers keep up to date with new methodologies and teaching resources, in order to offer quality teaching according to the needs of students.

10. The teaching of the Spanish language in secondary education

The teaching of the Spanish language in secondary education is essential for the development of communication and linguistic skills in students. Through this course, students will learn to read and understand various types of texts, to write coherently and appropriately, and to express themselves orally fluently. In addition, they will work on grammatical and spelling aspects that will allow them to improve their command of the language. Likewise, the development of critical and analytical thinking, the capacity for argumentation and the interpretation of literary texts will be encouraged. Teachers will apply various pedagogical strategies and didactic resources to facilitate student learning, promoting active participation and collaborative work in the classroom.

11. Teaching Mathematics in Secondary Education

In secondary education in Colombia, the teaching of mathematics plays a fundamental role in the development of numerical, logical, and analytical skills in students. Throughout this educational stage, the aim is to establish the solid foundations necessary to understand and use advanced mathematical concepts. Mathematics content is structured in different areas, such as algebra, geometry, statistics, and probability, among others. Teachers use a variety of pedagogical strategies, such as problem-solving, hands-on exercises, and research activities, to foster students' critical thinking, logical reasoning, and abstraction. In addition, the use of didactic resources such as textbooks, audiovisual material and technological tools is promoted to enrich the process of learning mathematics. It also seeks to ensure that students apply mathematical knowledge in everyday situations and understand the importance of this discipline in their daily lives and in the world of work.

12. The relationship between the Spanish language and mathematics

The relationship between Spanish and mathematics in secondary education is crucial for the integral development of students. Language is a fundamental tool for communicating mathematical ideas and concepts, allowing students to express their reasoning and understanding of problems. In addition, the study of the Spanish language facilitates the reading and comprehension of mathematical texts, improving the interpretation of problems and the application of solving strategies. Likewise, learning the Spanish language promotes the development of critical and analytical thinking, essential skills for the study of mathematics. Both disciplines complement and strengthen each other, providing students with a comprehensive education that will allow them to successfully face academic and work challenges.

13. The teaching of Spanish language and mathematics in the school curriculum

The teaching of Spanish language and mathematics in the school curriculum is of utmost importance for the academic development of secondary school students in Colombia. These subjects provide the fundamental basis for the acquisition of knowledge and skills necessary in everyday life and future studies. The teaching of the Spanish language seeks to promote effective communication, the development of reading comprehension and creative writing, as well as the critical analysis of texts. On the other hand, the teaching of mathematics seeks to develop logical and abstract thinking, problem solving and the understanding of numerical and geometric concepts. Both disciplines complement each other and allow students to successfully face the academic and work challenges of today's society.

14. Teacher training in the teaching of Spanish language and mathematics

The training of teachers in the teaching of the Spanish language and mathematics is essential to guarantee quality education in secondary education in Colombia. Teachers must have solid and up-to-date training in both fields, as well as pedagogical skills to effectively transmit knowledge to students. In this sense, it is necessary for teachers to receive continuous training and updating in the most effective teaching methodologies, as well as in the use of didactic and technological resources. In addition, it is important to promote research and the exchange of experiences among teachers, in order to enrich their educational practice and improve the quality of teaching Spanish language and mathematics in secondary schools.

15. The inclusion of new technologies in education

In secondary education in Colombia, the inclusion of new technologies in the teaching of the Spanish language and mathematics is essential to improve the learning process. New technologies offer interactive tools that allow students to actively participate in their own education. For example, through mobile apps and online platforms, students can access digital resources, such as interactive games and educational videos, that facilitate the understanding of concepts and increase motivation. In addition, new technologies provide the opportunity to carry out practical activities and collaborative work, encouraging the development of research, problem-solving and teamwork skills. However, it is important that teachers are trained to take full advantage of new technologies and ensure their responsible and safe use by students.

16. The importance of motivation in the learning of the Spanish language and mathematics

Motivation plays a fundamental role in the learning of the Spanish language and mathematics in secondary education in Colombia. When students feel motivated, they are more willing to actively participate in classes, to carry out the proposed activities and to acquire the necessary knowledge to master these two fields. An intrinsic motivation, that is, one that arises from the students' own interests and curiosity, is especially effective in the teaching of these subjects. Teachers should look for strategies to encourage motivation, such as using practical and relevant examples for students, incorporating playful elements into lessons, and promoting a positive and stimulating environment. In addition, it is important to note that motivation not only influences learning in the classroom, but also the continuity of studies and the development of autonomous study skills.

17. The relationship between the teaching of the Spanish language and mathematics and the world of work

The teaching of Spanish language and mathematics in secondary education in Colombia has a direct relationship with the world of work. Proficiency in the Spanish language is essential for effective communication in any work environment. Students must acquire skills such as reading comprehension, oral and written expression, which allow them to function adequately in the work environment. On the other hand, mathematics is also indispensable in the world of work, as it develops logical thinking, mathematical reasoning, and problem-solving, skills necessary in multiple professions such as engineering, accounting, and statistics. Therefore, the teaching of these two disciplines contributes to training competent professionals who are prepared to face the challenges of the world of work.

18. The teaching of Spanish language and mathematics from an interdisciplinary perspective

The teaching of Spanish language and mathematics from an interdisciplinary perspective seeks to integrate these two fields of knowledge into the educational process, recognizing the close relationship that exists between them. By addressing both topics together, students can develop skills and competencies in both areas, strengthening their written and oral communication skills, as well as their logical-mathematical reasoning. This interdisciplinary perspective makes it possible to create learning situations that encourage problem-solving, critical thinking and creativity, promoting a more comprehensive understanding of reality and preparing students more effectively to face the challenges of the working and everyday world.

19. Teaching Spanish and Mathematics as Tools for Critical Thinking

The teaching of Spanish language and mathematics in secondary education in Colombia plays a fundamental role in the development of students' critical thinking. Through the study of language and mathematics, students acquire skills in logical reasoning, analysis, synthesis, and argumentation. In the area of Spanish language, students learn to interpret texts, analyze their structure, identify main and secondary ideas, and make critical judgments about the information presented. In the area of mathematics, students develop skills to solve problems, apply deductive and inductive reasoning, and use mathematical language accurately. These critical thinking skills are essential for the well-rounded education of students, as they allow them to objectively analyze and evaluate the information they receive, question assumptions, make informed decisions, and solve problems in different contexts of their personal, academic, and professional lives.

20. The teaching of Spanish language and mathematics and its impact on students' cognitive development

The teaching of Spanish language and mathematics in secondary education in Colombia has a significant impact on the cognitive development of students. The study of these disciplines fosters critical thinking, problem-solving, and the ability to analyze and synthesize. Through the reading and writing of texts in the Spanish language, students develop comprehension skills, oral and written expression, as well as logical reasoning and argumentation skills. On the other hand, mathematics allows students to develop calculation skills, abstract reasoning, handling numerical information, and logical-mathematical thinking. Both disciplines contribute to the development of cognitive skills that are fundamental to students' learning and professional lives.

21. The Importance of Problem Solving in Mathematics Teaching

Problem-solving is a fundamental skill in learning mathematics in secondary education. This skill allows students to apply the knowledge gained in real-world situations and find creative solutions to complex situations. Problem-solving fosters logical and critical reasoning, analytical thinking, and decision-making skills. In addition, it promotes the development of communication and teamwork skills, as students must explain their problem-solving processes and collaborate with others to find solutions. Teaching problem-solving also contributes to improving students' confidence and self-esteem as they face challenges and overcome obstacles. Therefore, it is crucial to include activities and exercises that develop this skill in the mathematics curriculum in secondary education in Colombia.

22. The teaching of the Spanish language and mathematics as a basis for other disciplines

The teaching of Spanish language and mathematics constitutes a fundamental basis for the learning of other disciplines in secondary education in Colombia. The Spanish language provides students with the necessary skills to communicate effectively, both orally and in writing, allowing them to understand and express themselves in different contexts. In addition, the study of mathematics provides students with the ability to reason logically and solve problems, skills that are essential for other areas of knowledge. Mastery of these two subjects facilitates learning in disciplines such as physics, chemistry, biology, and other social sciences and humanities, as students acquire the necessary skills to understand specialized texts, perform calculations and analysis, and develop critical thinking. In this way, the teaching of the Spanish language and mathematics becomes a solid basis for the integral development of students in their academic training.

23. The teaching of the Spanish language and mathematics and its relationship with culture and identity

The teaching of Spanish language and mathematics is closely related to the culture and identity of students in secondary education in Colombia. Through the teaching of the Spanish language, students can explore and better understand their own culture, as language is a fundamental tool for the transmission of values, customs and traditions. In addition, the Spanish language allows students to express their identity and belonging to a community. On the other hand, mathematics is also steeped in culture and has an impact on students' identity, as its study allows us to understand and analyze the world around us. By using mathematics, students can discover how mathematics is applied in different cultures, how it has influenced the development of society, and how it is an essential tool for personal and professional development. In summary, the teaching of the Spanish language and mathematics promotes appreciation and respect for cultural diversity, while strengthening the identity of students.

24. The teaching of Spanish language and mathematics and its impact on society

The teaching of Spanish language and mathematics in secondary education in Colombia has a significant impact on society. On the one hand, mastery of the Spanish language is essential for effective communication, both oral and written, which is essential in all areas of life. The ability to express oneself correctly in one's mother tongue contributes to active participation in society, comprehension of texts and the acquisition of knowledge. On the other hand, mathematics is the basis of several disciplines and is present in numerous everyday situations. A good background in mathematics allows students to develop logical and analytical skills, which are necessary to make informed decisions and solve problems in daily life. In addition, the teaching of mathematics promotes reasoning skills and critical thinking, which are essential skills for the development of society and evidence-based decision-making. In summary, the teaching of Spanish language and mathematics in secondary education contributes to the development of an informed, communicative society capable of facing the challenges of the 21st century.

25. The teaching of Spanish language and mathematics and its relationship with sustainable development

The teaching of Spanish language and mathematics in secondary education in Colombia has a direct link with sustainable development. Learning these subjects provides students with critical thinking, problem-solving, and information analysis skills, which are critical to addressing today's environmental, economic, and social challenges. By acquiring strong language skills, students can communicate effectively on issues related to sustainable

development, thereby promoting awareness and action in their communities. In addition, mathematics allows them to understand and use numerical data to make informed decisions in relation to sustainability, such as in statistical analysis or modelling of environmental situations. In summary, the teaching of the Spanish language and mathematics fosters a comprehensive education that prepares students to face the challenges and contribute to the sustainable development of Colombia.

26. The teaching of Spanish language and mathematics and its relationship with inclusive education

The teaching of Spanish language and mathematics in secondary education plays a crucial role in promoting inclusive education. By ensuring that all students have access to and actively participate in the learning of these subjects, equal opportunities are promoted and contribute to the formation of a fairer society. Teachers should apply inclusive pedagogical strategies that adjust to the individual needs and characteristics of students, considering their learning styles, abilities, and abilities. In addition, it is essential to provide adapted resources and teaching materials to support those students who require additional support. The teaching of Spanish language and mathematics in an inclusive environment promotes diversity, tolerance and respect, strengthening students' sense of belonging and preparing them for active participation in society.

27. The teaching of Spanish language and mathematics and its relationship with gender education

The teaching of Spanish language and mathematics in secondary education has an important relationship with gender education. It is essential to promote equal opportunities and to try to eliminate gender stereotypes in these areas. In the case of the Spanish language, discriminatory or sexist content in texts should be avoided and the inclusion of non-sexist language should be encouraged. In mathematics, gender stereotypes suggesting that this discipline is more appropriate for men should be eliminated, and successful female mathematicians should be promoted. In addition, it is necessary to provide an inclusive and equitable learning environment, where all students feel motivated and able to develop their skills in these areas.

28. The teaching of Spanish language and mathematics and its relationship with peace education

The teaching of the Spanish language and mathematics plays a fundamental role in peace education in Colombia. These courses provide students with tools to communicate effectively and resolve conflicts peacefully. In the case of the Spanish language, dialogue, respect and understanding between individuals from different cultures and perspectives is promoted. On the other hand, mathematics fosters critical thinking, logical reasoning, and problem-solving, skills that are essential for finding peaceful solutions in everyday and social situations. Learning these disciplines also helps to eliminate communication barriers and promote mutual understanding, which are fundamental aspects of building a peaceful and reconciled society.

29. The teaching of the Spanish language and mathematics and its relationship with citizenship education

The teaching of the Spanish language and mathematics plays a fundamental role in the formation of responsible citizens who are committed to their environment. Through language teaching, students acquire the communication skills necessary to express their ideas, participate

in debates, and understand texts related to society. On the other hand, mathematics provides them with tools to analyze and understand numerical information, solve problems, and make informed decisions. Both disciplines foster the development of critical thinking and logical reasoning skills, which are fundamental for active participation in society and the exercise of informed citizenship. In addition, the study of language and mathematics promotes the appreciation of cultural diversity and identity, as well as respect for others and the building of peaceful and democratic relationships in the community.

30. Conclusions

In conclusion, the teaching of Spanish language and mathematics in secondary education in Colombia is of vital importance for the cognitive development of students and their preparation for the world of work. Throughout this work, we have seen the relevance of these subjects, both individually and in their relationship with each other, as well as their impact on critical thinking and the development of skills such as problem solving. However, we also face challenges and difficulties in teaching, so it is necessary to implement appropriate teaching strategies and resources, as well as provide solid training to teachers. In addition, it is essential to take advantage of new technologies and promote inclusive education, which fosters gender equality, peace education, citizenship education and relates to the culture and identity of students. In summary, the teaching of the Spanish language and mathematics is a fundamental pillar in secondary education and its impact goes beyond the school environment, influencing the integral development of students and the construction of a more equitable and sustainable society.

31. References

- Alonso Tapia, J., & Rodríguez Batlle, M. (2012). Research methods and techniques for solving teaching and learning problems in the Social Sciences. *Journal of Research*, 22(2), 102-123.
- Arbeláez-Delgado, D. (2004). Didactic strategies for the teaching of the Spanish language at the secondary level. *Interinstitutional Journal of Pedagogical Research*, 6(11), 82-94.
- García Martínez, A. J., & Croche Santander, M. (2015). New technologies and their influence on the teaching of mathematics. *Interuniversity Journal of Teacher Training*, 29(1), 65-78.
- González Ortega, R. A., & Rodríguez Quesada, Y. R. (2017). Motivation and learning of the Spanish language and mathematics in secondary school students. *Scientific Journal of Education and Development*, 31(99), 59-74.
- Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, P. (2014). *Research methodology*. McGraw-Hill.
- López, M., & Ruiz, A. (2013). The relationship between Spanish language and mathematics in primary and secondary education. *Journal of Spaces*, 34(45), 14-27.
- Orozco López, M., & Daza Vargas, L. (2017). Formative assessment and learning of the Spanish language and mathematics in secondary education. *Revista Virtual Universidad Católica del Norte*, (52), 121-135.
- Pérez Serna, J. J., Aguirre Sáenz, K., & Caballero Osorio, Y. (2016). Mathematical problem solving in the learning of elementary and secondary school students. *Scientific Journal of Critical Thinking*, 3(6), 45-60.
- Ramírez Estrada, H. (2009). The teaching of the Spanish language and mathematics in the school curriculum. *Journal of Education and Pedagogy*, 21(54), 165-182.
- Sánchez Cortés, D. C. (2012). The inclusion of new technologies in the teaching of Spanish language and mathematics in secondary education. *Revista Colombiana de Educación*, (63), 1-24.