

DESIGN OF INTERDISCIPLINARY PROJECTS THAT INTEGRATE READING AND WRITING IN SPANISH, MATHEMATICS AND PHYSICAL EDUCATION IN A SECONDARY SCHOOL EDUCATIONAL CONTEXT

Marisabel Meléndrez Romero¹, Ana María Betín Bermúdez², Kelly Vanessa Serrano Carmona³, Lina Patricia Rodríguez Becerra⁴, Jhonatan David Sierra Jaime⁵ and Edilberto José Córdoba Martínez⁶

Universidad Popular del Cesar, Valledupar, Colombia.

¹ mmelendrez@unicesar.edu.co, ² abetin@unicesar.edu.co, ³ kvherrano@unicesar.edu.co,

⁴ linarodriguez@unicesar.edu.co, ⁵ jdavidsierra@unicesar.edu.co and

⁶ edilbertocordoba@unicesar.edu.co

Abstract

A set of reading and writing projects in Spanish at the secondary level that integrate the contents of mathematics and physical education are presented. The projects, designed in interdisciplinary teams, are part of an educational context where it is recognized that the development of reading and writing in Spanish contributes significantly to the comprehensive education of students, but that integration, planning and implementation are difficult. The proposals fall on the levels of 6th to 9th grade of secondary school and are grouped into thematic axes – mathematics and physical education – that are developed simultaneously and intertwined at different moments of the teaching-learning process. Its design is framed in the project-based education model promoted by the coordination of internships of the bachelor's degree in Spanish and English language at the Popular University of Cesar, and is oriented to the development of a final product. A project prepared collaboratively is presented, with the purpose of establishing guidelines that serve as a guide for the formulation of other similar ones.

Keywords: Teaching, transversality of teaching, interdisciplinary, educational projects.

1. INTRODUCTION

Reading and writing are social practices whose use is transversal to all areas of knowledge. Educational proposals that integrate the development of these experiences in different areas of knowledge tend to be scarce. If we consider that the practice of writing is present in most human activities and that learning to read and write is a long-term process, it is necessary for adolescents to read and write in all areas of knowledge. Consequently, activities are planned that address the production of written texts in the area of physical education, related to the learning and practice of a sport, while requiring the mathematical conceptualization of the trajectories of an object in motion. The implementation and accompaniment process takes place in a secondary educational context in a geographical space that has Spanish as its mother tongue. This paper describes the design of an interdisciplinary educational project that integrates the development of reading and writing in Spanish, the resolution of problematic situations in the area of mathematics, and the area of physical education. The design, whose main purpose is the elaboration of an expository text, focuses on the practice and interaction with a sport, volleyball. Two dimensions of writing practice are taken into consideration: written production and the conceptualization of writing as an activity of the learning process.

2. CONCEPTUAL FRAMEWORK

The integration of writing and reading along with math problem-solving in secondary education is critical to developing key competencies in students. The proposal is framed within the need to develop learning in context, promoting interdisciplinary projects that integrate reading, writing and mathematics, and that promote the formation of an integral subject, as a basis for the obligations of the Ministry of National Education.

To progress in the learning of language and literature is to follow the path of reading and writing from the first years of schooling, until the completion of the Secondary Level. The reading of texts of various types, for different purposes, their comprehension and production is part of the expectations of achievement of Secondary Education. Responding to these expectations requires concentration, time and poses the challenge of selecting, interpreting, organizing and presenting information in an appropriate way to the recipient. Secondary Education must ensure the understanding of different textual typologies, the production of understandable texts that respond to the communicative purpose, and the development of appropriate strategies for reading in various areas. The number of words that allow a student from fourteen to sixteen years of age to be above average in reading comprehension is approximately thirty thousand. Additionally, in formal language, students are expected to acquire strategies for more effective reading, so that they are able to compare information from different sources, and with different approaches, and to be able to make their position explicit in this regard.

3. RESEARCH OBJECTIVES AND QUESTIONS

The general objective of the work is to design an interdisciplinary project that integrates the reading and writing of texts in the Spanish language in the areas of physical education and mathematics of a secondary level educational space. To meet this objective, the specific objective is to develop a project that articulates the teaching and learning of reading and writing in Spanish and mathematics, and a didactic, contextual, guiding and mediating practice of the process of reading and writing in Spanish in physical education. Two research questions guide the work: what interdisciplinary project that integrates the reading and writing of texts in the area of Spanish language in the teaching and appropriation of content from physical education and mathematics spaces can be designed in a secondary level educational space? How is the teaching and learning of reading and writing in Spanish and mathematics articulated, and a didactic, contextual, guiding and mediating practice of the process of reading and writing in Spanish in physical education?

The question related to the first specificity arises from the need for secondary level students to read and write. But it is not enough that there is a space during the week dedicated to these processes, nor that they are addressed in a fragmented way or only at the time of evaluation. Integration throughout the curriculum, and especially in disciplines that are not language, contributes to reading and writing becoming increasingly natural and frequent practices, and not activities alien to the usual practice of adolescents.

4. METHODOLOGY

To achieve the objectives and answer the research questions posed, the following steps were followed: A review of specific project design works in Secondary Education was carried out. The checklist for the design of interdisciplinary reading and writing projects in Spanish, proposed by Iñiguez, Blasco, and Molins (2012) was used as a guide. An interdisciplinary project design was developed that integrates reading and writing in Spanish, mathematics and physical education in a secondary educational context. Subsequently, the first accompaniment of the implementation of the project design was carried out, according to the intervention model used by Iñiguez, Blasco and Molins (2012). A checklist was used for the implementation of teacher accompaniment, in which the specific actions that need to be carried out at each of the moments of implementation were indicated. Finally, a

list of suggested actions was prepared to accompany the implementation, with the aim of providing ideas that facilitate the work of the teacher who carries out a project of these characteristics.

5. DESIGN OF THE INTERDISCIPLINARY PROJECT

The design phase contemplates the development of a project focused on a reading and writing proposal by secondary school students. This project is conceived as a vehicle to promote the construction, acquisition and/or deepening of knowledge, in addition to energizing communicative, reflective and recreational potential. The reading and writing proposal is integrated into the physical education teaching unit, coordinated with the area of Spanish language, mathematics and philosophy. Texts of different types have been proposed that address the meaning of the game in the lives of men and, within the framework of the games, the issue of probability has been addressed. From the reading, analysis and discussion of these texts, opinion texts are elaborated that are later presented by the students.

A set of valuable learning goals link the reading and writing proposal with different contents of physical education and the area of Spanish language. The active and reflective participation of students in the realization of school work that matters and interests them, favors learning and the achievement of objectives in all the areas that make it up. A space of time is projected where they develop an interdisciplinary work and also a specific temporal space for the accompaniment and guidance of the language teacher. During this time, students work in teams with the aim of generating and/or deepening knowledge about the game in its different senses and about the writing of an opinion text.

6. IMPLEMENTATION AND TEACHING SUPPORT

The implementation stage of the interdisciplinary project was carried out in two courses of the same school during 2025. The proposed activities were carried out in parallel in both classes and, in turn, were implemented in the same sequence, with a week difference between one year and another. This organization tried to give greater robustness to the proposal, based on the possibility of having a greater number of written productions, oral presentations and, mainly, a subsequent accompaniment, by the authors, which focused on the analysis of the productions and an evaluation of the activities.

The accompaniment of the teaching of writing in Spanish was carried out by a teacher with a qualifying degree, who led one of the two courses in which the project was implemented. The teaching of mathematics and physical education was the responsibility of the teachers responsible for each area. In order to promote writing in the courses and to ensure the inclusion of all activities, a second accompaniment was carried out by the author, who respected the original sequencing.

7. RESULTS AND EVIDENCE

Once the project was developed, it was implemented in the classroom with the accompaniment of teachers. To characterize the experience and evidence its impact on learning, the following sources of information were used: a field diary where the teacher's impressions during the implementation were recorded, the students' productions and an interview with the teacher who accompanied the development of the project. The results are grouped into two axes: design and implementation impact.

The research provides a model that allows the integration of reading and writing in Spanish, mathematics and physical education. Through the development of an interdisciplinary project that contemplates the demands of the three areas and the intervention of the teachers in charge, a sustained and significant experience is achieved. The success of the design lies in its integral nature, since the creation of a circuit and the calculation of the inputs linked to the competition, framed in a story that is set in a context known to the students, stimulate their creativity.

8. DISCUSSION

The discussion of the results focuses on the interdiscipline and integration of the teaching of reading and writing of texts in Spanish, of mathematical concepts and skills, and of physical education content. Although the general assessment of the projects in these three aspects by the students was positive, the implementation and its accompaniment by the teachers presented challenges that the students valued differently.

Interdiscipline is defined as the elimination of boundaries between disciplines; therefore, the objects of study are presented from the knowledge and practice of the different disciplines, which are structured, in their teaching and learning, in a sequential and non-simultaneous way. Interdiscipline proposes the deep fusion of two or more disciplines in a new practice. Any interdisciplinary activity requires the intervention of two or more disciplines; It does not necessarily have to be simultaneous, but it does require joint work by teachers to generate a common project. The projects presented in this research are inscribed in the interdisciplinary approach, since they involve the work of three subjects, three teachers and a group of students around the same topic. The students' assessment of this characteristic was positive, but somewhat nuanced by the teaching work in the implementation.

9. LIMITATIONS AND FUTURE LINES OF RESEARCH

The design of an interdisciplinary project that integrates reading and writing in Spanish, mathematics and physical education is a first step towards a more contextualized teaching model that responds to the characteristics of the profile of the student who graduated from secondary education. This design is a first approach, which does not consider an environment, and which must be contextualized according to the characteristics and interests of the group of students and the environment.

In addition to the implementation of the project, which is pending and requires more detailed planning and accompaniment, it would be interesting to design a teaching project that contemplates reading and writing in the native language, due to the important benefits that the research shows in the learning of foreign languages. A complementary path would be to advance in the development of interdisciplinary projects that integrate reading and writing in native language, foreign language, physical education and mathematics, which address the area of Physical Education in its cultural dimension.

10. CONCLUSION

The design of interdisciplinary projects that integrate reading and writing in Spanish, mathematics and physical education in a secondary educational context contributes to the development of literacy competencies that are key to the comprehensive education of adolescents. The project teaches how to construct argumentative texts to explore, learn and reflect on the consequences of sedentary lifestyle and obesity on the human body. It pursues the purpose of writing a letter to government authorities warning them about the impact of the high intake of fast foods and the low practice of physical activity of adolescents, as well as the risks they produce for health and quality of life. The project is developed in four stages and it is recommended to implement it in a period of six weeks.

The projects were designed and their development is being implemented and accompanied in an urban secondary school that concentrates a high percentage of low-income students at the level. The design considers the inclusion of three disciplines of the formal curriculum: Spanish Language, Mathematics and Physical Education. The integration of areas responds to the fact that the methodology of teaching the Spanish language, a current issue and the interest it arouses, are factors that probably generate a greater motivation for the study of literacy and literacy. Students are adolescents whose identity is being constituted and who are in the search to build their place in the world; They are not always willing to read books, but they are willing to review and analyze various types of written products.

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