

**ELEMENTARY SCHOOL CARTOGRAPHY: VISUALS TO SUPPORT ELEMENTARY  
EDUCATION IN CHILE**

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**ABSTRACT**

A survey of the current teaching of subjects related to Cartography was conducted in some elementary schools in the metropolitan area. Its results led a group of university professors to implement a project aimed at developing more effective methods to be applied in the educational process.

In the first stage, the interest is centered on the design and elaboration of adequate cartographic material to supplement and vitalize the teaching of these school subjects taking into account the fact that the quality of the educational process depends largely on the pedagogical strategies used to achieve its objectives.

**INTRODUCTION**

The curricula of General Elementary Education include several subjects related to Cartography. In broad terms, the deficiencies detected in the teaching process derive on the one hand, from the lack of a correct conceptual and methodological view, and on the other, from the evident need of appropriate cartographic material.

Undoubtedly, this has affected the development of the children's potential abilities to understand the most fundamental concepts of this field of science, thus hindering the reading or handling of the cartographic material as well as the cognitive mapping young learners should be able to carry out (Catling, 1979).

## DIAGNOSIS

Our perception of the shortcomings present in the national education, led us to consider a course of action to solve the present problem. Before starting the design and elaboration of any cartographic material, it was necessary to conduct a survey to obtain objective data of the situation. Then, a questionnaire was applied in the Región Metropolitana (metropolitan area), in Santiago. It intended to show how the potential abilities of children between the ages of nine and fourteen years, are set in motion when using or applying basic cartographic concepts - concepts which are thought to be already acquired and therefore connected to their reality, not only as memorized concepts but also as internalized concepts (Salinas, 1994).

The test consisted of various questions both about the theoretical and the practical aspect. The former included some items asking about universally established definitions. The child was asked to answer with his/her own words or with memorized terms learned at school. The latter put the child in a simulated situation in which he/she had to provide an answer based on his/her understanding of space and concrete experience with his/her everyday environment.

There was a significant number of wrong answers to the theoretical as well as to the application questions of the test. The results obtained in this diagnosis test give evidence of a critical situation in an important sector of school children in the Region Metropolitana, as to their understanding and use of cartographical concepts.

These results indicated that the number of correct answers increases in inverse proportion to the level of the course. Thus, there is a higher percentage of correct responses in the fifth grade than in the sixth or seventh grade. The social factor was also considered in the survey as it generates clear differences in the results. In general terms, children from low and medium-low social status show a better reaction to application questions. However, these percentages are not high enough to be considered significant when compared with the low results of the children from high and medium-high social status. With regard to questions about concepts, the opposite can be observed: the answers of children from high and medium-high social status exhibit significantly higher percentages than the low and medium-low sectors whose percentages are near 0% in most answers.

During the course of the survey, we observed that the cartographic material used in most schools was neither adequate nor diversified enough to support the subject matters which required it. Inadequacies of the graphic documents used were due to different reasons: they either came from unwarranted sources or they were inadequate to the level of the class thus leading children to confusion with respect to the subject matter presented through them. The above mentioned drawbacks gave evidence of the urgent need of in-service teacher training or updating on two aspects: mastery of concepts and techniques to use cartographic materials, mainly those derived from the latest technologies related to Cartography.

#### DESIGN AND ELABORATION OF THE MATERIAL.

Learning is not a passive but an active process: its quality will depend on the pedagogical strategies used to develop the learner's participation in understanding the ideas and basic principles of a discipline (MINEDUC, 1989a).

For this reason, since 1983 a group of professors of the Department of Cartography, has been engaged in an educational endeavour, namely, the development of a better approach to the teaching of the discipline in elementary education. In this stage the learner presents the greatest heterogeneity; a number of variables of a highly complex nature configures our learner in his/her geographical, demographical, social and cultural diversity. To impart the theoretical and practical knowledge of the discipline it is necessary to improve the existing methods and techniques.

Our interest has been centered mainly on supporting the educational process providing suitable cartographic material to supplement efficiently the teaching of these subject matters, in agreement with the present Planes y Programas (national curricula) issued by the Ministry of Education (MINEDUC, 1989b).

As a starting point, a permanent link with over 30 private and state-owned elementary schools was established, with the purpose of designing cartographic material compatible with the school level, taking into consideration the learner's stage of maturity together with his/her real capacities. The importance of an increased knowledge of the factors which

characterize the school-child development is emphasized so as to center the pedagogical strategies on his/her potential for more realistic achievement (Cronbach, 1968).

A permanent process of feedback directed the elaboration of cartographic material. The interdisciplinary team in charge was formed by educators, psychologists, cartographers and the university students themselves.

The instructional material is divided into:

1. Pictures, magazines and games. They explain the main basic concepts of Cartography to train the learner in the use and correct interpretation of traditional or automated cartographic models.

2. Representations of cartographic and thematic topography, specially designed to meet the needs of the school levels they were prepared for and the demands of the learners' specific personal and geographical situation. In a first stage, training and handling of aerial photography were included to be followed by a second experimental stage when satellite images were to be included.

3. Drawings mixed with captions. These consisted of representations of specific topics accompanied by their corresponding explanation. The aim is to design a document to be used on a self-instructional basis: the use of well-balanced material containing clear, easy-to-interpret information provides students a challenging setting to achieve a working knowledge of subjects related to cartography.

#### FURTHER DEVELOPMENTS

After the initial objectives have been reached, our next goal is to automate the material prepared so far, producing a computerized version of the new material with the resources of multimedia technology. Former experiences have yielded encouraging results.

The program for the next stages is the following: - Conducting wider-range surveys to continue the assessment of the new material in other cities, so as to improve its design. The feedback obtained both from teachers and students

will allow us to vitalize its contents in order to adapt them to diverse geographical and cultural situations.

- Implementing an in-service training programme for elementary and highschool teachers with a nation-wide coverage. This programme will update the teachers' preparation on these subjects. Teachers in their important role as participants in formal education have the responsibility of defining and applying the best methodological strategies.

- Insertion of this instructional material in the national educational system through innovative methodologies. These should be based on the children's potential ability developed with the help of appropriate stimuli and teaching methods.

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