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USE OF DIDACTICAL RESOURCES FOR PEOPLE WITH VISUAL IMPAIRMENT IN AN APPLICATION OF TACTILE CARTOGRAPHY FOR GEOGRAPHY TEACHING

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This paper aims to make a proposition of a methodology for production and use of a set of learning resources targeted to geography teaching and adapted for visually impaired students, in order that an interdisciplinary approach in school is valued. Issues on perception of space by impaired vision students were initially considered, the geography teaching and the importance of tactile cartography in communicating geographic information. The contribution of the technology in teaching and inclusion of visually impaired students were also discussed.

The use of adapted educational resources is necessary, since schools are gradually increasing the use of maps, diagrams, graphs and models, which allow geographical knowledge and make it easier the perception of space. Nevertheless, they are primarily for visuals, which limits their use when a visually impaired student is in classroom.

Besides schools, the media constantly uses graphical representations of various types in newspapers, magazines, internet and on TV. Maps and charts are preferably used to illustrate or explain various themes. So, the visually impaired person restricts his knowledge to the representation shown on oral description, not always possible or convenient. Maps, scale models and tactile models among others, are being used out of school for orientation and mobility and the achievement of autonomy.

It is taken into account that the producers of maps, on being responsible for selecting information, generalizations, and final drawing, must take it clear what the purpose of each representation is and what public it is intended to. In the case of tactile graphics representations, the producers need to take into account a number of other factors besides those mentioned, as the size and definition of each symbol, the amount of information contained in the representations and what users it specifically refers to. For example, if the maps are for blind people, there is no need to worry about colors. However, surveys statistics show that in Brazil most visually impaired people focuses on the group of people with low vision.

This means that the production of maps with information only in Braille, using no contrasting colors and enlarged letters restricts its use to a smaller group within the universe of people with visual impairments. Furthermore, in preparing a suitable map, especially if it is used in public places, one must consider a guarantee of autonomy in reading and interpretation of the representation by the user.

In school environment, this situation differs since the learning process relies on the mediation of the teacher, who may add verbal information to adapted maps and other features. Considering these aspects, the methodology seeks to provide educational resources so that the teacher can explore a wide variety of subjects from the main theme.

The city of São Paulo, whose emphasis along the history is on urban growth, was chosen in this study as the object for the production of didactic resources and evaluation by visually impaired users for its utility. Whereas the students' everyday space is an environment rich in experiences that must be included in pedagogical practices, the study of the city allows the interface between the categories time and space and between local and global scale.

The set of teaching materials is composed of five maps of São Paulo municipality (1881, 1929, 1949, 1962 and 2002) that represent an expansion of the urban area, an interactive scale model of the city of Sao Paulo in the nineteenth century with tactile-elements, audio-tactile and graphic-tactile representations of four historic buildings in the city center from two periods (the nineteenth century and nowadays), a synthesis map of the urban sprawl and a topographical scale model of the city.

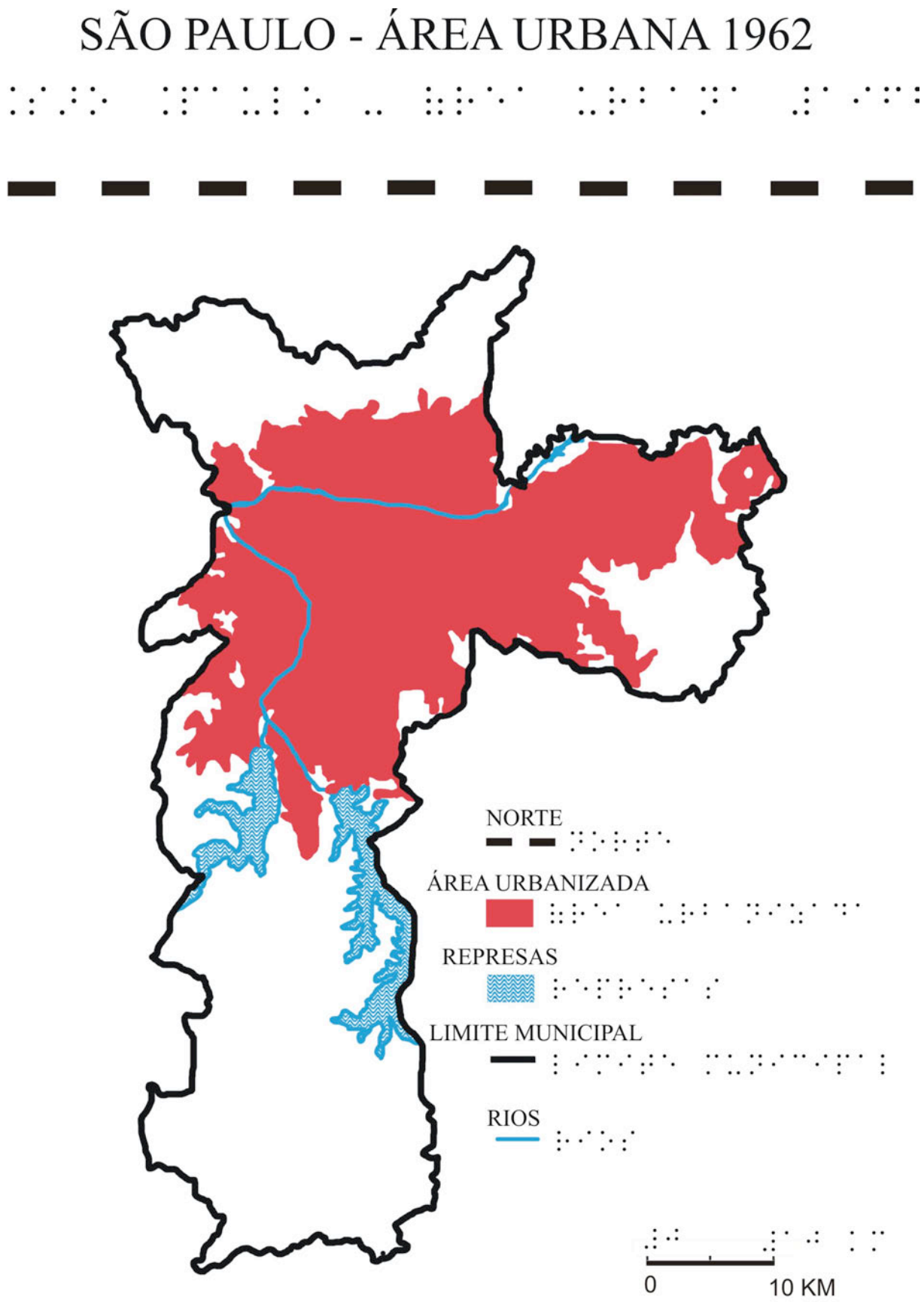

Figure 1: Tactile map of São Paulo municipality

Whereas the didactic materials were developed to assist in learning a specific subject - the city of Sao Paulo with an emphasis on urban growth and changes in the landscape – it was chosen to evaluate the

materials with students who were enrolled from the 9º year in Elementary School, students in junior high and higher education.

In a teaching sequence lasting about an hour and a half, the use of sonorous scale model, maps and illustrations provided the approach of some physical, political, economic and cultural aspects of the city of São Paulo, encouraging visually impaired students to go beyond the representations description displayed.

Figure 2 : Tactile illustration: "Sé Church 1847"

The application of new technologies for the construction and use of tactile graphics and other teaching resources, especially the inclusion of sounds has been discussed and evaluated for their effectiveness in using the model with special education teachers, Geography teachers and visually impaired students. The material was satisfactory both as resource for teaching geography and history and as a tool for inclusion of people with special needs in public spaces.

Figure 3: Interactive scale model

The evaluation of the materials showed that the combination of tactile maps and illustrations with sonorous scale models provides and facilitates the study of the city of Sao Paulo, its analysis and interpretation as well as establishing relationships with various themes in a dynamic and effective process for Geography teaching, indicating possible paths for an interdisciplinary approach in school.

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KEYWORDS

Geography teaching; didactical resources, relief models with sound, visual impairment and blindness; accessibility, inclusion.