

# The Production of Maps for Students in the Context of School Culture

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## Abstract

The objective of this article is to discuss a methodology for the production of maps developed for children at junior school (7 to 10 years), from the research we have been undertaking since 1997 at the Laboratory of Research for the Teaching of Geography and Cartography for the production of maps and local atlases. Firstly, we are going to present the foundation and the process involved to produce these materials. Following that, we will discuss some findings that resulted from these experiments in terms of the adequacy of these cartographical materials for school use and finally, we will present our conclusions about the production of the key for pictorial maps designed for schools.

## 1- Background and objectives

In Brazil the first research projects regarding maps for schools began in the 90's, when the school curriculum defined the study of place (school area and surroundings) as the main theme for junior students (students from 7 to 10 years of age). Even though, the study of the local neighborhood was already present in the previous school curriculum, other factors created a demand for more in-depth studies of this theme. One of these was the sharp increase in migration to medium-sized and large cities, leading to a large contingent of migrants whose children began attending schools in places foreign to the culture of their origin. Besides this, the knowledge of

place became more important as a consequence of globalization, due to the need to create a feeling of belonging in the new living spaces.

These two key points are related to other crucial education issues, particularly those related to the function of their cultural transmission. We cannot deny the strong relationship between education and culture. According to (Forquin 1993: 12), culture is an asset of knowledge and competencies, of institutions, of values and of symbols, established throughout the generations and characteristic of a particular human community, defined in a more or less broad manner and a more or less exclusive manner. We do not want to say that education transmits the culture or a particular kind of culture, rather a part of a culture, whose selection is included in the school curriculum documents, which according to Yves (Chevallard 1991) relates to the knowledge to be taught. This knowledge concerns something which already existed and is considered as something that should be preserved by means of cultural transmission that takes place at schools. However, the content that is taught and school practices in general deviate from following the prescribed curriculum, and what actually happens is that it results in a conflict of relative factors, for example, the selective memory of the teachers (both to recall and forget certain content, practices and values). (Perrenoud 1993), upon taking into consideration the *modus operandi* of teachers, favors the idea of *bricolage*, not with relation to the materials produced, but with relation to the way knowledge is produced and practical tasks are created: making use of the means available, re-using materials, modifying situations, i.e., making use of elements that have originated from different systems. The task attributed to the school of transmitting something of culture not only lies in selecting the knowledge and transmittable cultural materials, but making them “teachable”, that is, turning them into something teachable, memorized via practical map activities and subject to “evaluation in a class, of one year level, to their timetable, to a system of communication and work” (Perrenoud 1993:25), constituting a specific “school culture”. This culture is marked by rituals, routines making the present content in the manuals ineffective. Nowadays, this method is frequently used in the production of maps and cartographic material in schools and consists of a rich variety of material for reflection with respect to the teaching of maps.

The social transformations that we are referring to above, lead to disagreements in terms of the school's function of transmitting culture, since the school brings people together of diverse backgrounds, with their own customs in terms of their manner of speaking, eating habits, day-to-day customs, religious beliefs, ethic values and aesthetics. The cultural diver-

sity of the new subjects involved in the educational process (teachers and students) challenges the methods of schools to deal with the function of cultural transmission. Moreover, the official curriculum guidelines recommend a large amount of flexibility in selecting content and the method of teaching it. A further challenge is to reconcile the demands of the different groups that come in contact with each other at school, which form the current “school culture”.

We have received requests from teachers and education authorities to prepare cartographic materials that are more dynamic and better adapted to this new context. This caused us to look for more adequate ways to study local area and represent it cartographically. The most traditional way to produce materials and assist teachers with the teaching of local area quickly became inadequate, because it began with the idea that knowledge which had already been established about the city, its origin, and its geography should be transmitted by means of text and maps. The latter used to be produced according to conventional cartographic knowledge. We realized that it did not work this way with new students (and new teachers), whose needs were more complex, different from those that we assumed to be important at this level of education.

In one survey (Viero 2002) carried out for the production of a school atlas for the municipality of Santa Maria (located in Rio Grande do Sul, 270,000 inhabitants), we discovered that the teachers possess an elementary knowledge of the maps. They weren't aware of what would be desirable on maps adequate for students at junior year levels, because the maps displayed a lot of information resulting in confusing, imprecise atlases with excessively detailed maps. We concluded, therefore, that the teachers should be educated as to how the maps and atlases are produced.

We also observed that this behavior is supported by erroneous suppositions about the function of teaching today. One of the consequences of globalization was the proliferation of information spread via different means of communication (the media), which added to other social and cultural factors, produces a sense of “loss of identity” at the school and with everything that happens in it. According to some theorists, one effect of globalization is the weakening of previous forms of identification with a national culture and the strengthening of other cultural ties. Despite certain aspects of national identities continuing strongly (such as legal rights), identity with local place has gained greater importance.

Stuart Hall adds that one of the characteristics of globalization is the “space-time compression”, perceived as the reduction of distances and as the impact of the events that occur in one place on other places and people. He believes that time and space are the co-ordinates of all the systems of representation, which are responsible for the production of identities (2005: 71).

One of the current functions of the school is, therefore, to enable the formation of identities. The representations created in the school context permit this, among them the maps are responsible for creating spacial identities. However, place and space is no longer the same thing, we have put down roots in places, but space can be quickly traversed by modern means of transport and communication.

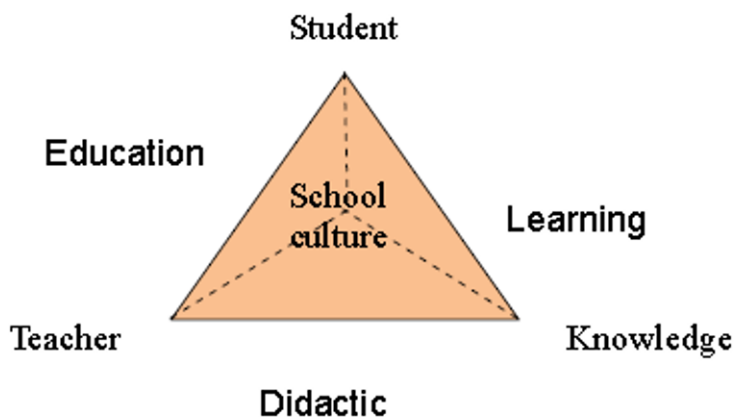
These considerations take us to the issue of identity and of school culture as the guiding references when taking into account “school cartography”, thinking of it as the whole practice and complete knowledge related to the spacial representations in the school context.

## **2- Approach and methods**

School cartography forms part of the didactics of geography. Didactics deals with the relationship between student/knowledge/teacher, which can be represented by a triangle, on which knowledge is at the top. We created a pyramid ([figure 1](#)) to demonstrate the relationship between these three items and “school culture” in such a way that:

- Knowledge is seen as the social construction that occurs when there is interaction between the subjects;
- Teaching has an open character, subject to influences and factors from outside the school environment, which, in part, are introduced by these agents – the teachers and the students;
- Learning is a continual transformation of the student's knowledge and a constant search for new teaching practices on the part of the teachers.
- The school is considered to be the setting where the students relive their personal experiences, which allows them to reconstruct and co-construct knowledge. Language is the instrument, which allows this construction

and reconstruction of knowledge, being that the construction of socio-spatial knowledge is influenced by cartographic language.



**Figure 1:** The didactic pyramid

In view of what is presented above, we based our research on the school culture, taking into consideration school knowledge and practices such as social construction. Therefore, we don't see it as knowledge originating from the prescribed curriculum, rather as knowledge replete with meaning and values provided by the groups that we find at educational institutions.

We carried out surveys about the production of maps and school atlases for different municipalities in the state of São Paulo. The first of these was conducted between 1998 and 2000 for the production of an atlas for three municipalities (Almeida 2003). Between 2002 and 2004 we undertook some research to discover how teachers use these school atlases. A third experiment was carried out between 2006 and 2008 for the preparation of an atlas for the municipality of Sumaré (SP), which forms part of metropolitan region of Campinas (SP). From these experiments we tried to draw some conclusions which would increase our knowledge of School Cartography. One aspect which stands out is the production of the key used on the maps in these atlases. Before going on to discuss this point, we believe it is necessary to outline the approach and methods that we used in this research.

We outline a collaborative research program that involved our work group and teachers from the public school systems. The issue in question was not “how to teach with an atlas”, but how different subjects relate to knowledge of the place within a school context. This knowledge is present in the daily routine and memory of each person, allowing for incursions into time and space underpinned by each subject’s experiences, which is quite different from elaborating knowledge about something one does not know based on experience. So the organization of the research had to be very permeable to the classroom routine, ensuring the presence of the teachers’ practices and the manifestation of their conceptions, questionings and dilemmas. Thus, the methodological design of the research was abundant in records and included sufficient time for discussion and reflection, allowing for the interlocution of subjects from different social places: university professors and students, school teachers and students, administrators of the Education Bureau, and even people from the community.

The overall purpose was to create an atlas that promotes identity and a feeling of belonging through greater knowledge of the region.

The projects’ objectives were:

- To define themes for the Atlas starting with the issues presented by the schools;
- To conduct research for a sociocultural diagnosis of the school population;
- To define a thematic axis based on the results of the research and on the Curricular Parameters and adapted to school practices.

The methodology begins by considering that local school atlases are cartographic products that are very different in nature to other types of atlases, because they should be appropriate to the school curriculum. This kind of atlas should be organized according to a sequence of concepts and abilities that will be acquired by the students over several years; moreover, they contain topics relating to the daily experiences of the users of the locale.

The similarity between the information contained in the atlas and the knowledge of the local users concerning the locale makes the atlas more accessible, enabling them to easily identify errors it may contain. This also makes it easier for the users to make criticisms about the atlas. Therefore, the production of local school atlases requires extensive research to avoid such problems.

Thus, school cartography research within the context of teacher education and the production of curricula can be conducted in two ways: the first, by adapting theoretical and technical knowledge about cartography to primary and secondary school contexts, thereby establishing a clear difference between university and school knowledge. The second way is examining teaching practices to assess the extent to which they expose learners to new knowledge, rather than simply reproducing knowledge originating from a university curriculum. This implies the need to consider different social backgrounds as a reference when carrying out atlas activities in schools. The social background plays an important role adapted to students' needs.

Therefore, school learning is a social construction, and not an isolated process. The school's role is to impart certain values and knowledge to students. Collaborative action-research between the university and the local department of education was the methodology we applied here (Clandinin and Connelly 2000). This concept underpinned the three aforementioned projects, whose results were used to propose a methodology for the production of local atlases for children. To this end, we came up with the fundamental points of our methodology, which are as follows:

1. Conduct a thorough research of the students' background and the culture and values associated with their community in order to identify the elements that make up the local culture.
2. Choose a thematic axis around which the contents of the atlas should be organized. The central axis discusses identity and belonging.
3. Develop atlases that are appropriate for each teaching level.

### **3- Results**

Among the diverse range of results that emerged from this body of research we are going to discuss some of the findings with respect to the production of the key. We chose to talk about the key because it is through this that children represent and recognize spacial representations. It is important to mention that the activities involving the keys were preceded by activities where the students looked at model maps and practiced drawing the home-school route, which enabled them to work with different elements of a map before actually using the maps.

The atlases mainly consisted of large-scale maps (1: 10 000 or 1: 8 000), where the urban fabric is visible enough to locate the geographical points that identify the route represented, giving them (the maps) an identity. Considering that it is an issue of cultural background, we sought out elements that would allow us to identify these landmarks from the student's perspective (and not just from the teacher's), according to the vision of "kinder culture" (Steinberg and Kincheloe 2001). We are able to cite examples. Children experience a city according to their interests and the perceptive ability they have, to frequent and enjoy this space, therefore, children that travel by car to school capture images of the city at a more rapid pace and in less detail than those that cover this trajectory on foot or by bicycle. A square takes on a certain significance from the relationships that develop among the people that frequent it and if this is peaceful, the meaning of "square" could then be "a place of leisure", however if there are frequent conflicts among the residents and violent elements, the "square" will take on the meaning of "a dangerous place". As we can see further on, children create symbols for the key where the predominant meaning (or value) they attribute to these different places, in the first example, could be representing a square as a scene where there are toys, flowers and children, or as in the second example, a place where there are armed bandits.

There are many studies regarding the methods children use to learn with maps (Wiegand 2006), which we aren't going to comment about here, however we will make it clear that we adhered to the socio-cultural approach of Lev S. Vygotsky and his co-authors. According to him, cognitive development and human learning are fundamentally social, as knowledge is shared and the senses are established culturally, such that interaction is a way to produce knowledge and transform knowledge. Collaboration and cooperation are also fundamental for learning to take place. Hence, in the experiments that we carried out, the teachers were instructed to organize the students into groups in order to be able to do the activities and conduct a group discussion at the time the work was being carried out.

In one of these classroom situations the proposed activity was to make a map of the neighborhood and then present it at a municipal meeting of the Council Budget Committee. The teacher's objective was to produce a pictorial map with the students, which represents the demands of the residents neighboring the school. The students carried out an interview with their parents in order to find out what improvements they would recommend for their neighborhood. Each student drew a key and located the points on the map. Following this, they formed groups so that they could compare their keys and agree on a single key. For this to happen the students were



required to choose the main improvements recommended and then each group presented their results to the class. The teacher observed that many maps mentioned the same improvements, however with different symbols, which some of the students also noticed. The next step came about automatically – create a single key so that the map could be presented at the meeting. This took a certain amount of time and an ongoing discussion regarding the main improvements for the neighborhood and, mainly, as to how they should be “drawn”.

The “symbols” created by the students presented a striking resemblance to the real situation. The majority of them consisted of a setting and not of an object. This caused a certain amount of difficulty to reproduce the key and did not comply with that which we wished to introduce (the idea of a symbol or icon, whose characteristic would evoke a universal idea). For example, one of the improvements was to have all the doctors at a health clinic, which was represented by a picture of a doctor attending a patient on a stretcher (figure 2).



**Figure 2:** Key for “the need of more doctors”

Presenting a map with a summary of the resident's demands, established another social context for this activity – the negotiations would be done in the community outside the school environment, which required, therefore, a type of cartographic production where the group of students took their ideas to a group of residents of that neighborhood. The intention was to hold a public exhibition of the students' ideas regarding the most important improvements. Thus, the creation of the key required that they establish generalizations, looking for a single meaning, but at the same time retaining the identity of the group that produced it, which was decided on by mutual consensus between the students. To exemplify this better, we have included a passage, which was written by the teacher when they were discussing the symbols for the map:

*(...) The students still hadn't realized that the symbols for the same demand were different, so I asked them:*

*-What symbol did you come up with for the school?*

*-small house*

*-backpack*

*-books...*

*-Is there any way of putting it differently?*

*-No, we have to talk about it and choose one*

*-That's right, we have to decide. Is there any symbol on the atlas?*

*-A pencil*

*-but there are different colors, why? (teacher)*

*-Because it is a public, municipal and private school (student)*

*-That's it.*

*The solution in the end was to draw all the symbols for "school" on the board and decide which one was best, by putting it to a vote. This solution was applied to all of the symbols chosen for the map key.*

*The choice of symbol for "security" generated a lot of discussion about the risk of keeping a weapon at home, as one of the students had suggested using a picture of a weapon as the symbol. One student suggested using the symbol which is in the Atlas - a police siren, which was accepted by the group, which meant that the conventional use of the key won out for the first time.*

Figure 3 shows the symbols chosen for the collective key. Some retained the pictorial character of the first map, others became something a little more iconic, stylistic, generalized (for example, the symbols for "more doctors" for "security"). The personal touch, which was found in the keys of the first maps ceded to symbols that were more universal.



[Key translation: Leisure center, Day CareCenter, Public School, Street Lighting, Cleaning the Streets, Cleaning empty blocks of land, Doctors, Paving, First Aid, Road Resurfacing, Security]

**Figure 3:** Map key “Demands for the Council Budget Committee”

#### 4- Conclusion and future plans

For school cartography the concept of the background map (or basic map) is introduced via cartographic initiation, when the students come in contact with questions related to location, to their point of view and proportion. Now the thematic maps contain a summary or generalization of knowledge that circulated regarding a theme or a problem. Therefore, a certain level of standardization is required for the symbols used in the key, as well as a certain categorization of knowledge, which, in turn, gives rise to a negotiating process in terms of accepting what should remain on the map as something legitimate. Now, the legitimization of a given piece of knowledge, in the context of school situations, results from the relationships established between the subjects (teacher and students) and from the tension between the knowledge to be taught (prescribed by the curriculum) and the knowledge brought by these same subjects.

We believe that this argument should be taken into account when choosing the thematic maps presented in the school books and atlases destined for the use of the students. The issue of the key, therefore, is strongly linked to the establishment of meaning, so that the summaries can be presented on the maps. Thus, there is the need to “negotiate” which symbolic forms it will contain. In the early years of junior high school, this plays down the importance of the search for a neutral or correct solution, according to which there can only be a single relationship between the symbols and their meaning.

The choice of the symbols draws attention to the meanings, which are attributed to them culturally and socially. A sign takes on different meanings according to the cultural context of its readers, and also possesses a political character, because it transmits inherent conceptions to the symbols themselves. In the example given, using a weapon as a symbol for “security” brings about a strong sense of violence, whereas the use of a police siren can denote “help” or “protection”.

The meaning of these educational activities became more explicit upon becoming discoveries made by the students, from knowledge arising from their daily experiences in the place that they live. Thus, the geographical concepts and their representation emerged in a contextualized mode, and the production of knowledge became more significant.

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