

A CARTOGRAPHIC ATLAS CREATED FOR AND WITH THE HELP OF CHILDREN

Temenoujka Bandrova
University of Architecture, Civil Engineering and Geodesy of Sofia

Presented at the Conference on Discovering Basic Concepts, held in Montreal (Canada), August 10–12, 1999

Introduction

Modern society has an intensive exchange of varied information. Social relations form a type of communications, and daily life is built on this kind of information exchange. We learn to speak and write to communicate with each other. Cartography is a powerful means of communication, if we know how to use it. But, if we want to express something by means of a map, we have to use an appropriate language. Yet, similar to real life, the use of language is different for adults and children. To this end, this paper presents a way to communicate with children. Children's knowledge and information can help us in the process of designing maps and atlases that will both facilitate our work and return maximum information about map objects and phenomena to children. As Professor Morita has suggested 'The cartographer must learn how the non cartographer draws a map, what they want to communicate, what symbolism they use and what is their logic' (Morita, 1997).

In our study, the children participated in two stages of map creation: the design and the validation stage. They were stimulated to propose a manner of map symbol construction. They were later asked to use the prepared maps to explain the information and knowledge, and what they gained as a result of the experiment.

Using children to help in the creation of maps

A child's introduction to Cartography begins with the first map that is seen. Frequently, children view maps in books, and try to read them. Therefore, mapmakers should consider a child's thought process and ideas about how objects and phenomena appear on a map. Having children help in this regard can perhaps be explained as a kind of collaborative technology for the composition and design of children's maps. It consists of the following steps:

- gathering information and collecting existing map sources - done by the cartographer;
- defining clear rules for symbol creation - done by the children;
- estimating the ideas of different children and choosing the best symbols proposed - done by the cartographer;
- designing and composing the map - done by the cartographer;
- testing the map - done by the children;
- editing the map by integrating the test results - done by the cartographer;
- publishing the map - done by the cartographer.

Experience with using the help of children has shown good results in map and atlas creation, as well as the later perception children have of maps. When children play and work on the creation of maps, they feel responsible. These results are important to develop ideas and stimulate new learning. This information is useful, especially when the ideas of children and mapmakers are used together.

The chain: "map maker - map user"

Working with children during the composition and design of maps will help both sides of the "map maker - map user" chain. Cartographers collected the data and categorized the information relating to the objects of interest, prior to explaining to the children what should be drawn on the map. They did this, however, without explaining how to do it. In such work with 8-10 year old children the instructor noted the following difficulties:

- the children did not extract a lot of information;
- the children did not remember the symbol system easily or immediately;
- they looked at the legend often, which made them easily bored and less concentrated;
- the children did not understand all elements of the legend and the map;
- the children mixed or forgot the information when they used more than one map.

The help provided to the children by cartographers overcame all of these difficulties. Mapmakers should ask the children as special users how they want to present the information and data on the map, or how they can do this independently. After processing the children's work and preparing the map, the experiment with our special users may help to develop the links between mapmakers and users.

Composing an atlas using children's help

The common goal for cartographers and children was to compose and design an atlas "Animals and Plants of the World." The cartographers collected the information about geographical features to be represented as well as the data necessary for special objects connected with the themes of the atlas. The children participated in the creation of a symbol system utilised to present the special content pertaining to animals and plants, and the Earth's relief.

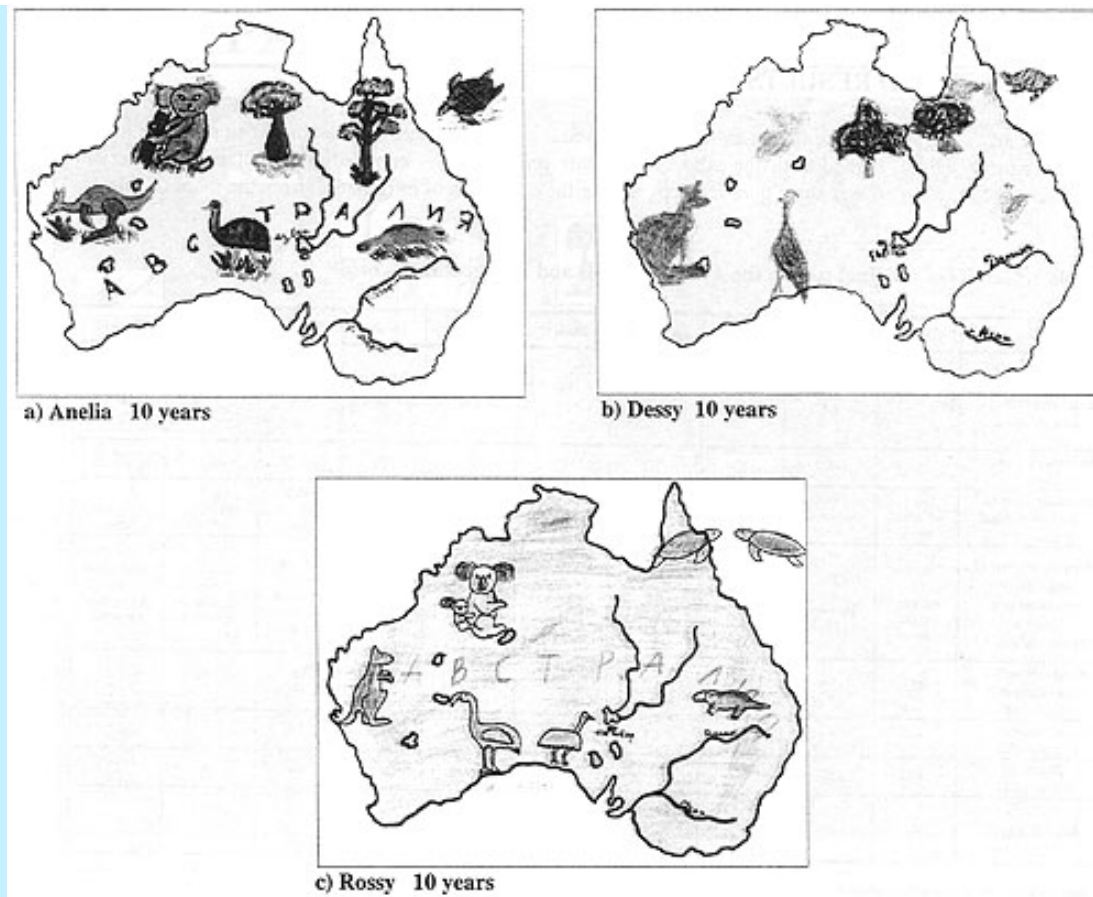


Figure 1: Maps made by three girls representing animals and plants

For this purpose 20 students, 8-10 years old were asked to imagine how the given animals and plants could be represented on the map. The responses of three students are shown in Figure 1. For mapmakers, they are surprisingly good.

The pictures on the children's maps were drawn with fine lines and in suitable colours. The mapmakers chose the best symbols to represent animals and plants. The symbols were scanned, and after minor editing in photo-image software, they were prepared quickly for the symbol system of the atlas.

The representation of the Earth's relief was done using shades of grey. The grey became darker with an increase in altitude. This method of representing the Earth's relief was chosen because:

- the children quickly recognized and correctly read this map element consistently;
- the representation was elegant and did not disturb the content of the map;
- the perception of the relief was secondary, after the specialised content;
- the colour symbols representing animals and plants were recognised easily on the first level.

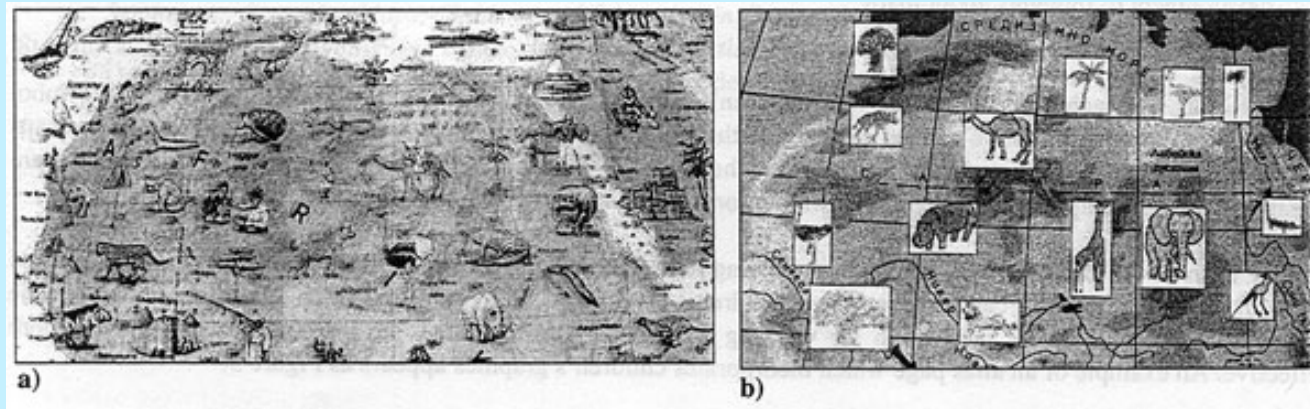


Figure 2: Comparing the maps with relief representation using different methods

Figure 2 shows that the maps have the same content, but the relief is represented in colours. The grey-scale variant can be compared here. In the study, the children chose map b) for ease of reading and understanding.

Final test and results

A test for map reading and information extraction was conducted after the atlas preparation. Ten students, in Grade 4 at the primary school, worked with the atlas. The results provided new knowledge on unfamiliar material. The students were asked to answer some questions concerning the extraction of information from the maps (Table 1).

Questions/ Answers	Student	Student	Student	Student	Student	Student	Student	Student	Student	Student
Did you learn something new about animals and plants? Give examples.	Yes 6*	Yes 1*	Yes 1*	Yes 1*	Yes 2*	Yes 1*	Yes 6*	Yes 5*	Yes 3*	Yes 4*
Bulgaria's climate zones?	r	r	T*	r	r	r	r	r	r	r
Australia's physical and geographical zones?	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid	SubT, subtorrid, torrid

What do the World maps show presented as a notch in continental maps?	The place of the continent in the world	The place of the continent in the world	Do not understand	The place of the continent in the world	Antarctica	No answer	The place of the continent in the world	The place of the continent in the world	The place of the continent in the world	The place of the continent in the world
Plants viewed in more than one continent?	Yes 5*	Yes 4*	Yes 3*	Yes 5*	Yes 4*	Yes 2*	Yes 5*	Yes 3*	Yes 5*	Yes 4*
Animals found only in Australia?	7*	7*	0*	4*	4*	2*	7*	3*	3*	7*
Plants in Antarctica?	No	No	No	No	No	No	No	No	No	No
Atlas dislikes?	No	No	Some animals are not readable	I don't see every letter clearly	No	No	No	No	No	No

* indicates number of examples provided

T* is an abbreviation for Temperate

SubT. is an abbreviation for Sub Temperate

The recognition of different kinds of symbols resulted in the children being capable of the following:

- correct identification;
- extraction of all the information;
- development of thoughts about maps;
- giving suggestions.

These results were achieved by dealing with children's symbols. All of the children who participated in the symbol design and in the questionnaire wanted to continue the work with maps. They wanted to create other thematic maps and were amazingly interested in Cartography. They wanted to explain to other children how the maps were designed, how the maps should be read and what information and knowledge was extracted from maps.

