

## “TEACHING MAPS IN PORTUGUESE AND HUNGARIAN ELEMENTARY SCHOOLS: A STUDY”

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### I. Introduction

The Hungarian and Portuguese systems of education are twelve years long, which include the elemental and secondary levels. In Hungary, the education is obligatory until the 8<sup>th</sup> grade, corresponding to the termination of Primary School and following four years of Secondary School (Figure 1). At present, some schools have begun to introduce other experimental structures (for example, six years of Elementary School, three years of Secondary School and three years of High School), but these ones can still be considered isolated cases, being applied with the purpose of verifying their organizational and educational effect.

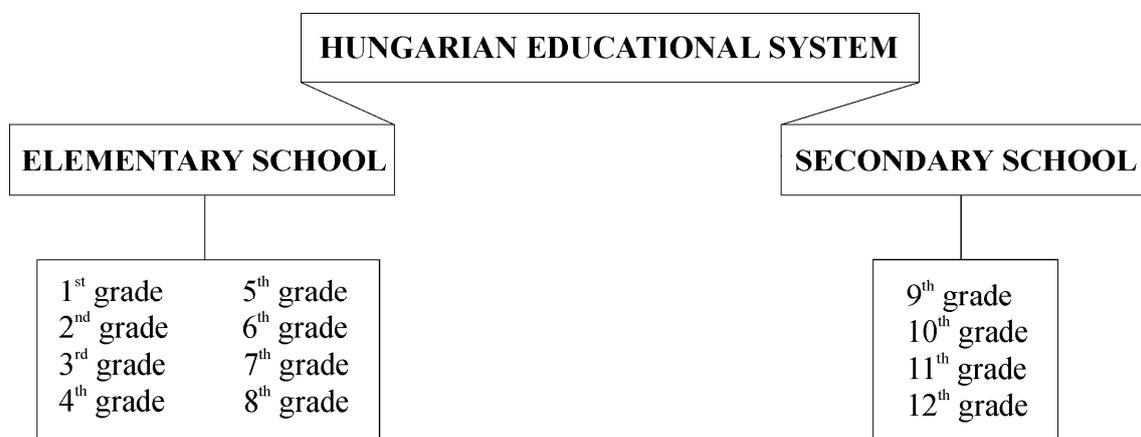


Figure 1. Structure of the Hungarian system of education

In Portugal, the twelve years of general education are divided in two periods. The first one is called "basic" or "elementary", the second one "secondary". The basic period consists of three stages, each of them divided into three years, while the secondary period has a total of three years (Figure 2).

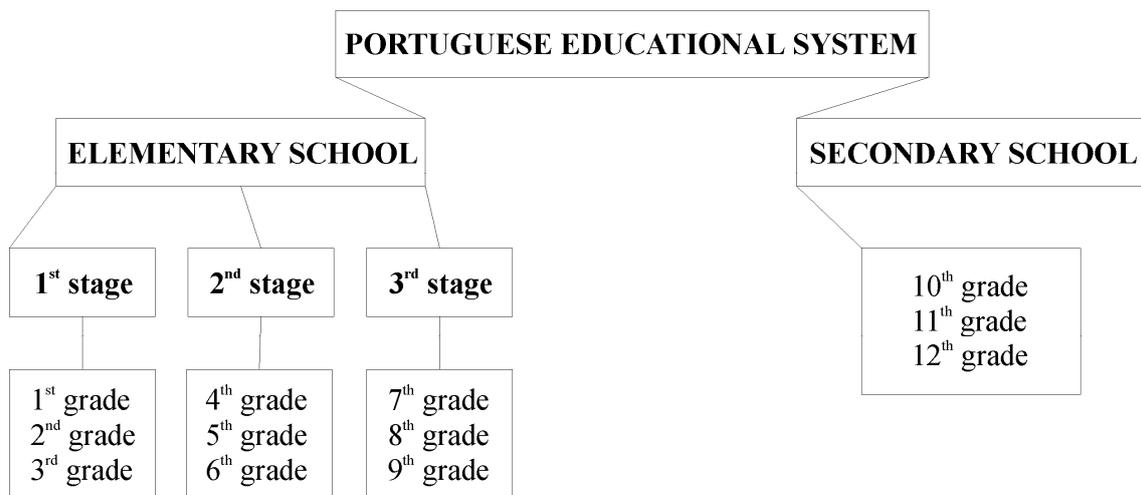


Figure 2. Structure of the Portuguese system of education

## II. Teaching Geography and concepts related to maps

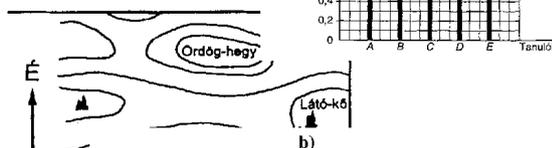
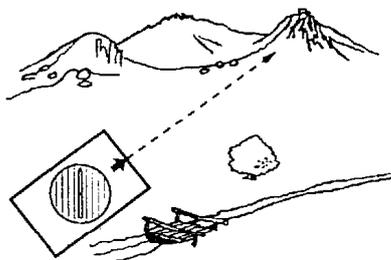
The Hungarian pupils acquire the first knowledge of Geography in 2<sup>nd</sup> grade, when they begin to learn topics as elemental shapes of the relief and principal differences between town and city in the subject “Learning and protecting the Environment”. This subject is also taught in the 3<sup>rd</sup> and 4<sup>th</sup> grades, introducing children to elemental cartographic concepts about the shape of the Earth, the cardinal points and the orientation. These lessons are deepened and widened with other new concepts in grade 5, in the subject “Learning about Nature”, when the children learn the majority of the map concepts to use during the remaining years of primary and secondary schools (Table 1). Not only in the subjects directly related to Geography they learn these concepts: in the subject “Hungarian Grammar” they learn about geographic names (in 3<sup>rd</sup> and 5<sup>th</sup> grades), while in Mathematics they practice the interpretation of charts (diagrams), measuring of distances and angles, etc., as well as they solve exercises based on the use of maps (Figure 3).

In Portugal, I could observe that many and different textbooks are published for the same subject in a determined grade. A very similar situation began to emerge in Hungary in the last five years: the Ministry of Education has approved the introduction of a new national curriculum and diverse local curricula for the general education. New publishing houses have been founded and these publishers have edited their own textbooks for elementary and secondary education, which are based on different curricula. Because of this, during the present research I have consulted simultaneously textbooks edited by different publishers, trying to obtain a general background of the map concepts that children learn in both countries.

The Portuguese system of education is very similar to the Hungarian until grade 4. They begin to learn about the shapes of the relief and to compare the different kinds of settlements in the subject “Estudo do meio” (Learning about Environment) from the 2<sup>nd</sup>

A tájoló iránynyilával beállunk a hegycsúcs irányába, majd a szelencét addig forgatjuk, míg az iránytű északi pólusa az irányhárfa északi jeléhez nem kerül.

Az így rögzített tájoló szélét ráhelyezzük a térképen az álláspontunkra úgy, hogy az irányhárfa az északi jele a térkép északi irányába mutasson. Ekkor a tájoló a meghatározandó tereptárgy (a Látó-kő) irányába mutat.



Kötőjellel írjuk azokat a földrajzi neveket, amelyek égtájak szerint nevezik meg a földrészek vagy országok egy részét.

a) Földközi-tenger	Csendes-óceán
Csepel-sziget	Sárga-folyó
	Velencei-tó
	Háromashátár-hegy

### Feladatok

Matematika 5. Gyakorló 8.110–8.112. vagy Matematika gyakorló III. 2.61.

6.23. Tájéoló segítségével tájékozódj!  
a) Határozd meg a fő égtájak irányát!

**Dominika.** Kolumbusz második útján, 1493. november 3-án pillantotta meg a szigetet, s mert aznap vasárnap volt, Vasárnap-szigetnek nevezte el. (A spanyolországi egyházi latin nyelvben *dominika vasárnapot* jelentett.)

– Melyik tengerben van Dominika szigete? \_\_\_\_\_



b) Írj még példákat az egyes csoportokhoz!

Figure 3. Examples about the teaching of concepts related to maps in other subjects in Hungary

grade. This subject is taught also in 3<sup>rd</sup> and 4<sup>th</sup> grades, learning elemental concepts as cardinal points, orientation, etc (Table 1). In the 5<sup>th</sup> and 6<sup>th</sup> grades we can find the first difference between the two methods of Geography teaching: the subject “Learning about Environment” is substituted by the “History and Geography of Portugal”, which includes historic and geographic themes. This situation remains until the 7<sup>th</sup> grade, when History and Geography begin to be taught independently of each other. In this grade, the Portuguese pupils review (and complete with other new concepts) the major part of the map concepts they learnt in the first two stages, from grade 2 to grade 6.

### III. Some considerations about both methods to teach map concepts

If I have to describe the methodology of teaching concepts related to maps in only one sentence, then I could say that while the Hungarian method presents theoretical definitions about maps in more detail, the Portuguese method is more practical and the learning of cartographic concepts is based principally on the map use in the classroom. Table 1 allows us to outline the principal coincidences and differences between them:

SHORT COMPARISON OF THE TEACHING OF MAP CONCEPTS	
PORTUGAL	HUNGARY
<b>2<sup>nd</sup> grade</b>	
<ul style="list-style-type: none"> <li>- Presentation of easy maps of Portugal, with the principal cities. Elemental comparison (based on photos) between different kinds of settlements (city-town-village) and regions (beach-field-mountain).</li> <li>„Maps” (sketches) of quarters or districts.</li> <li>- <i>Tracing routes on maps or sketches.</i></li> </ul>	<ul style="list-style-type: none"> <li>- Elemental shapes of relief (plain, hill, mountain)</li> <li>Differences between city and town.</li> <li>- <i>Graphic comparison between the elemental shapes of the relief.</i></li> </ul>
<b>3<sup>rd</sup> grade</b>	
<ul style="list-style-type: none"> <li>- Shapes of the relief. Cardinal points. Orientation based on the Sun and the Pole Star. Orientation with a map. Compass rose and compass.</li> <li>- <i>How to make a compass?</i></li> <li>- Review: routes, drawing a sketch of a district, kinds of settlements.</li> </ul>	<ul style="list-style-type: none"> <li>- Shapes of the relief: hill, valley, and basin.</li> <li>Hydrograph: brook, river, lake. Cardinal points.</li> <li>Compass. Elemental definition of a map. Altitude.</li> <li>Colours on the maps. Basic notions about geographic names</li> <li>-<i>Practices of orientation.</i></li> </ul>
<b>4<sup>th</sup> grade</b>	
<ul style="list-style-type: none"> <li>- Poles, Equator, meridians and parallels. Shape of the Earth. Globe and world map.</li> <li>- <i>Puzzle of a hypsometric map of Portugal. Maps to colour. Understanding hypsometry: Completion of chart based on the colours of a map.</i></li> <li>- Review: Orientation, use of a compass.</li> </ul>	<ul style="list-style-type: none"> <li>- Shape of the Earth. Globe. Orientation with a compass. Geographical maps. Political maps. Scale and graphic scale. Values of altitude on a map.</li> <li>Equator, North and South Pole.</li> <li>- <i>Easy measuring of distances on a map. Drawing a map sketch and orientation helped with this map.</i></li> <li>- Review: Use of a compass.</li> </ul>
<b>5<sup>th</sup> grade</b>	
<ul style="list-style-type: none"> <li>- Scale and graphic scale. Legend of the maps. Orientation in the 15<sup>th</sup> and 16<sup>th</sup> centuries. Nautical chart from the 16<sup>th</sup> century.</li> <li>- <i>Use of the “Classroom Atlas”. Making a model of the relief of the Iberia peninsula.</i></li> <li>- Review: Poles, Equator, hemispheres.</li> </ul>	<ul style="list-style-type: none"> <li>- Orientation without compass in the Nature.</li> <li>Orientation with maps. History of maps. Definition of map. Kinds of maps. Representation of the relief and hydrograph on maps. Hypsometry. Map symbols.</li> <li>Latitude and longitude. (<i>Theory and practice</i>)</li> <li>- Review: Orientation with a compass. Globe. Scale and graphic scale. Geographical names.</li> </ul>
<b>6<sup>th</sup> grade</b>	
<ul style="list-style-type: none"> <li>- <b>Drawing “historical routes” and symbols on maps.</b></li> <li>- <i>Workbook with blind maps, to draw historical themes on the maps.</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>Origin of the geographical names from other countries.</i></li> <li>- <i>Use of maps in subjects related to Geography and History.</i></li> </ul>
<b>7<sup>th</sup> grade</b>	
<ul style="list-style-type: none"> <li>- Collateral and intermediate cardinal points. Measuring of distances on a map. Geographic co-ordinates: latitude and longitude. Maps of small and big scale. Scale and graphic scale.</li> <li>- <i>Creation of thematic maps. Use of geographic co-ordinates.</i></li> <li>- Review: Compass rose, poles, Equator, Greenwich, hemispheres, meridians and parallels.</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Use of maps in subjects related to Geography and History.</i></li> </ul>
<b>8<sup>th</sup> grade</b>	
<ul style="list-style-type: none"> <li>- <i>Use of maps in subjects related to Geography and History.</i></li> </ul>	<ul style="list-style-type: none"> <li>- Shape of the Earth: Geoid.</li> <li>- <i>Comparison of settlements according to the number of inhabitants. Representation and identification of them on the maps. Use of geographic co-ordinates on maps.</i></li> </ul>
<b><i>Practical lessons are written with italic font</i></b>	

Table 1



Figure 4. First maps presented for the pupils in the Hungarian and Portuguese schools.

- In both countries there are themes taught with special interest (in theory and practice), constituting the base of the cartographic knowledge to be acquired by the children: shapes of the relief, shape of the Earth, its representation as a globe and a map, orientation (including cardinal points and the use of the compass), scale of the maps and geographic coordinate system.
- Beginning from grade 2, the Portuguese textbooks present easy maps of Portugal to illustrate the content and to draw routes on them between cities. These maps contain only coasts, principal rivers and cities. Maps are included in the Hungarian textbooks from the 3<sup>rd</sup> grade, when children learn the first concepts about maps (Figure 4).
- Some theoretical aspects of cartography are expounded in more detail in the Hungarian textbooks. I may mention the hypsometry and kinds of maps (geographical, political, tourist, etc.) among them.
- In Portugal, the basic concepts about the history of maps are principally related to the discovery travels conducted by the Portuguese navigators in the 15<sup>th</sup> century. The Hungarian pupils learn this topic more widely, including maps from the Marshall Islands, Egyptian maps, Roman maps, medieval maps and Hungarian maps, mentioning also famous cartographers as Ptolemy, Mercator, Ortelius and some Hungarian cartographers.
- In both systems, the teaching to use thematic maps is not explained in the textbooks. The learning of this theme is based on the practical use of thematic maps in other subjects (like History), and in the teacher's explanations about it. In Portugal, however, the learning method offers more opportunities for the pupils to familiarize themselves with this kind of maps in a practical way.

#### IV. An interesting Portuguese experience: children create their own maps

A very positive aspect of the teaching of map concepts in Portugal is the activities oriented in the text- and workbooks to learn map reading with the use of non-conventional methods of teaching. The methods can be divided into two groups:

- Learning and playing: These activities are oriented in grade 3 for the first time, when the pupils learn the orientation and they make their own compass. In 4<sup>th</sup> grade, children make a puzzle using a hypsometric map of Portugal, and in 5<sup>th</sup>

grade they build a model of the relief of the Iberia Peninsula following the teacher's orientations (Figure 5).

- Creating their own maps: The textbooks in 4<sup>th</sup> grade include maps to be coloured by the children. In grade 5 the use of the "Classroom Atlas" is introduced. This Atlas contains blind maps related directly to the content of the textbook ("History and Geography of Portugal"). At the end of the different chapters we find indications with which map the pupils ought to work. In the Classroom Atlas, children read the precise information about how to create this map. If the children have any difficulty, then the teacher can help them in the solution of this task. In this way, the pupils create their own Historical Atlas, and under the teacher's guidance they acquire aptitude to interpret the information

## Aprender de outras maneiras

6) Decalca novamente, em papel vegetal, os contornos do espaço peninsular que é ocupado no teu mapa do relevo (base n.º 6) pela cor amarelo-escura. Fixa o papel vegetal em cima da cartolina amarela e corta-a respeitando os contornos do molde.

7) Cola a cartolina amarela já recortada por cima da Península Ibérica (verde).

Verifica no teu mapa de relevo a posição em que a deves colar.

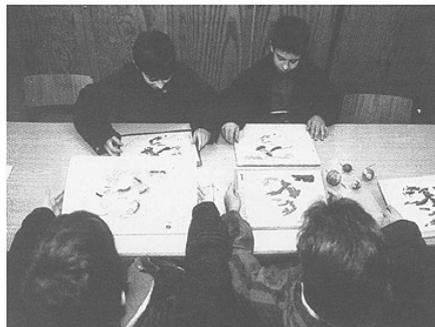


Fig. 1 – Maquetas de relevo feitas pelos alunos da Escola Preparatória do Canidelo.

Poderias fazer uma **maqueta do relevo** da Península Ibérica **com outros materiais**: – só com plasticinas; com placas de cortiça sobrepostas e depois pintadas; com rede

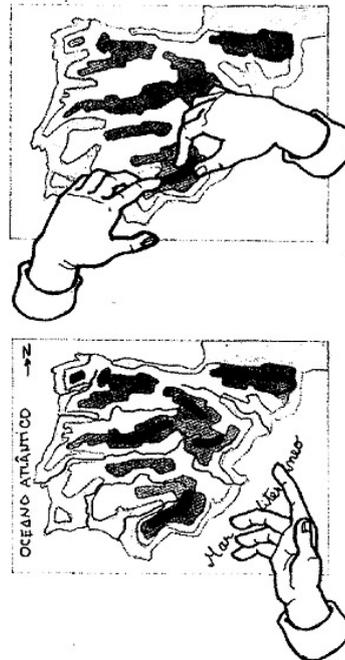


Figure 5. Indications to make a model of relief in a Portuguese textbook.

represented in the thematic maps they are going to use in the forthcoming years (Figure 6). In 6<sup>th</sup> grade they work again with this kind of Atlas (called also "Support Workbook" in other textbooks), creating also their own historical maps. I would remark that this Atlas does not substitute the printed Historical Atlas or School Atlas used by them during the lessons: both atlases complete each other.



**6** Inicia a construção do teu **Atlas de Aula**.

Realiza as tarefas propostas na página 2 do Atlas, que se referem à **“Forma e Limites da Península Ibérica”**.

**7** Continua a construção do teu **Atlas de Aula**.

Realiza as tarefas propostas na página 4 do Atlas, que se referem à **“Forma e Limites da Península Ibérica”**.

Figure 6. Indications to work with the “Classroom Atlas”.

## V. Applying the new technologies in the map teaching for children

These two countries have begun programmes for the introduction of digital technologies in the education. In Portugal, the programme called “Nónio século XXI” (“Child, 21<sup>th</sup> Century”) represents this nation in the programme “European Schoolnet”, which groups the member countries of the European Union and future members of this organization. The Portuguese Ministry of Science and Technology works in the project “Ciência Viva” (“Live Science”), which presents homepages on the Web containing themes of scientific interest, specially designed for children. A nice example is the homepage “Latitude e longitude” (Figure 7), presenting concepts related to cartography, specifically orientation and geographic co-ordinate system. The address of this site is: <http://www.ucv.mct.pt/equinocio/>



Figure 7. Portuguese and Hungarian homepages presenting map concepts for children.

Beginning from 1997, the Hungarian Ministry of Education has worked to create a national net for the access of secondary and elemental schools to Internet, called “Írisz-Sulinet” programme. Actually, all the secondary schools and more than 500 primary schools (of a total of 3500) are connected to Internet. One of the objectives of this programme is to offer homepages presenting attractively designed materials for the young visitors and based on the content of the subjects to learn. The Department of

Cartography of Eötvös Loránd University participates in this initiative and has prepared a homepage to present map concepts learnt by the children in the Hungarian schools (Figure 7). This homepage can be found on this address:

<http://lazarus.elte.hu/hun/dolgozo/jesus/gyerterk/terkep.htm>

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