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Developing problem-oriented worksheets for expanding the possibilities of teaching Hungary's geography

Hungary

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Introduction

Although numerous attempts have been made before, the methodology of geography teaching has been highly difficult to renew in Hungary. The reasons for it are very complex, and one of the contributing factors is the scarcity of teaching and methodological aids available for teachers, which do not only describe new methodological trends or contain the prepared curriculum, but which combine both. Another significant problem is that mainstream geography teaching still strongly focuses on disseminating lexical and static information, and it hardly encourages students to take part in the process of knowledge acquisition.

Based on our preliminary studies, our main goal is to provide geography teachers and their students with tools suitable for problem-oriented education, and with digital technology innovations which are supposed to make the methodological renewal of geography education more effective than it has been ever before. Another aim of ours is to provide a kind of starting point for both the teachers of geography working in public education and the students to develop more practical knowledge acquisition and learning methods based on an interactive and student-centered approach.

The educational aid we are currently developing is a student's handbook, accompanied with a teacher's resource book, both of which include specially developed worksheets processing the geography of certain micro- and mesoregions as well as some selected towns of Hungary. The handbook is recommended to be used from Grade 8 to Grade 13. Each worksheet employs a problem-centered approach when discussing the selected topic, and they also help teachers develop their own methodological techniques and adapt them to other parts of the curriculum. The already prepared worksheets are tested, teacher and student feedback is taken into account when designing new ones, and necessary changes are made accordingly. The effectiveness of knowledge acquisition is also measured with the help of an educational assessment professional.

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3, University of Debrecen, 4, University of Pécs Hungary

By using the below maps, compare how the channel of the River Tisza has changed.

- 1.. How did river length and speed change? Find out by comparing the maps.
- 2. How were oxbow lakes formed along the river?





The main principles are as follows. Each worksheet consists of four pages. The use of informative, descriptive, textbook-like texts is reduced, and other, problem-oriented exercises are used instead. These exercises include utilizing large-scale maps of different periods, introducing contemporary environmental and/or social problems of a selected region or town, providing thought-provoking exercises, and a wide variety of different source materials like datasets, figures, sketch maps, pictures, etc. Both the worksheets and the teacher's resource book contain QR codes which can be used to log into websites containing interactive on-line worksheets. In addition, the teacher's resource book includes different teaching methods and possible solutions of the individual worksheets depending on the target group as well as additional information, educational and didactic tips and tricks.

The poster displays the goals and the steps of our research development, and it presents the preliminary results through a concrete example.

Are you curious? Do the following experiments and make conclusions.

1. Where do rain or irrigation water disappear? Do they flow deeply downward? Does soil store a part or the whole of them? Examine the water retention and water permeability of different soils!

2. How to stop sand moving?

3. How does the wind shape a vegetation-free or vegetation-covered area? How are the higher parts of a plain formed?

4. What happens to the alluvium/sediment when the river reaches a lower area?

5. What kind of (constructional or destructive) work is the (river) water on a larger slope area in the foreground? How does (river) water build and/or destroy a steep gradient area





Compare the below maps of pre-flood and post-flood maps of Skege Umaps, then answer the following questions: below

- 1. How did the extent of the built-in area change between the 1860 and the 1980s?
- 2. How did the street network change?
- 3. How did the size of water-covered areas change?
- 4. How did the size of forest areas change?
- 5. What important role does the size of forest areas h. concerning air quality?
- 6. How many ways were there to cross the zero efore the 1879 flood and in the 1980s?
- 7. Do you think that the intended goals of the reconstruction were achieved?







Aims

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Our overall aim is to help the methodological renewal of geography education by introducing problem-oriented teaching techniques and developing digital technological innovations to be used in the classroom. We aim at providing help for geography teachers working in primary and secondary education as well as for students wishing to be part of the development of an interactive and student-centered knowledge acquisition and learning strategies.



Implementation

The first task of the research period was to develop the structure of the worksheets and to compile the thematic list of the teaching aids set. The main principles are as follows: Each worksheet consists of four pages. The use of informative, descriptive, textbook-like texts is reduced, and other, problem-centered exercises are used instead. These exercises include utilizing large-scale maps of different periods, introducing contemporary environmental and/or social problems of the selected region or town, providing thought-provoking exercises, and a wide variety of different source materials like datasets, figures, sketch maps, pictures, etc. Both the worksheets and the teacher's resource book contain QR codes that can be used to log into websites containing interactive on-line worksheets. In addition, the teacher's resource book includes different teaching methods and possible solutions of the individual worksheets depending on the target group as well as additional information, educational and didactic tips and tricks.

We intend to develop a complete set of teaching aids that focuses on the geography of certain micro- and mesoregions as well as that of towns and cities in Hungary. The set is recommended to be used by Grade-8 to Grade-13 students and their teachers; it includes a teacher's resource book and individual student worksheets, all of which serve as useful tools to plan a geography lesson or a whole teaching unit concerning Hungary or a part of Hungary. The set employs a problem-centered approach to teaching and learning, and it encourages the use of different techniques, which may also be applied to other parts of the geography curriculum. The length and the structure of the individual student worksheets covering certain regions and towns of Hungary are prepared according to the same principles.

The hydraulic engineer prepared two plans concerning the confluence of the Maros and the **Tisza in the 19th century. Points for discussion:**

1. Which plan was implemented?

2. Which plan offers more advantages to water quality protection and which is more advantageous to commercial aspect?

3. List arguments by using the following keywords: shipping, market, beach, cyan pollution, catchment area, gold mining, Apuseni Mountains, water quality, Maros, Tisza, flood risk.





1. Which letter denotes the point on the below map where this particular Google Street View photo was taken (see the link below)? 2. Why do local people call this riverside sector "flat"? 3. What physical geographical characteristics made this size some a public beach?

We prepared the content list of the resource book, and we selected the regions and towns to be covered by the worksheets and the resource book.

We prepared four complete student worksheets in the first research year, all of which we uploaded to the interim results page, and we also included them in the attachments.

As part of developing digital innovations to be used in the classroom, we created storage space at the University of Pécs, we developed the IT backup and structure of data and file hosting (Dr. Ervin Pirkhoffer).

We developed an evaluation survey for teachers who test the applicability of the already existing student worksheets, interactive on-line worksheets and the teacher's resource book (Dr. Andrea Farsang).

The first worksheets had already been tested in the following institutions: the practising schools of the University of Szeged, the University of Pécs, and the University of Debrecen as well as other secondary schools affiliated with the project. The first results are currently being processed.





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