



JOURNAL  
OF • BALTIC  
SCIENCE  
EDUCATION

ISSN 1648-3898

**Abstract.** *Despite the long history of the science of geography, its current educational position is uncertain. Meanwhile, it offers knowledge elements useful in everyday life, required for literacy in natural sciences. The subject is unique in giving information necessary for orientation in the social-economic field and reveals the relationship between the society and the environment. In Hungary the public educational requirements for a subject include the incorporation of social scientific results or the transfer of integrated knowledge founding such results. This requirement is met fully in the curriculum of geography, however, continuously decreasing the number of lessons reduces its efficiency. The questionnaire survey covering 1218 respondents focuses on the position of geography as a subject in public education and on the opinion regarding the knowledge it provides and assesses the depth of geography people have from what they learnt in school.*

**Key words:** *education of geography, Hungary, knowledge of geography, opinion of geography.*

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## STUDYING THE PUBLIC OPINION OF GEOGRAPHY AS A SUBJECT AND ITS KNOWLEDGE ELEMENTS: A CASE OF HUNGARY

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### Introduction

#### *Problem of Research*

The actuality of the research is justified by the current situation of geography teaching in Hungary as it reached its worst position in the last 250 years (number of lessons per week: 7 lessons/6 years). Disadvantageous conditions apply not only for geography but for the rest of the natural sciences as well in several countries of the European Union. Further problems are created by the over-theoretical methods applied in the education of natural sciences (Vida, 2008) that has not been adjusted to the decreased number of lessons and to the requirements of competence based education. As a result, the number of students enrolling higher education in natural sciences is decreasing both in the European Union and Hungary (Rocard et al., 2010). This may result in the lack of qualified labour in the long-term (Rocard-jelentés, 2007; Vida, 2008). Problems generated by such processes are emphasized in the Eurobarometer report (Rocard et al., 2010), OECD report 2006 (OECD, 2007), PISA 2012 report (OECD, 2013b), Rocard-jelentés (2007), OKNT reports (Ádám et al., 2008a; Ádám, Baranyai, Kertész & Szalay, 2008b) as well. Realization of the educational reforms related to natural scientific knowledge is problematic due to the decrease in the GDP proportional financial support for education as well (OECD, 2013a).

The time and resource constraints mentioned above, have much worse effects on the competency based education of natural sciences demanding devices and modelling (experiments, field studies, etc.). Competition of subjects for the decreasing possibilities results in alleged (or real) oppositions making the development of the educational potential of natural sciences even more difficult.

Its uncertain scientific classification also contributes to the deterioration of the educational conditions of the geography subject. Although the majority of the curriculum of geography as a subject is natural science (OECD, 2007) it



is frequently ignored in the debates of the training and in the educational reforms due to the contradictory views of its representatives. In our opinion, this contributes to that it is unclear which knowledge and competencies belong to geography for the decision makers of the society at various levels leading to misconceptions (Ütőné, 2002).

#### *Research Focus*

Based on the above situation analysis the aim of the research is to give essential information to the changes made to the geography subject in the expected educational reform in Hungary based on the analysis of the opinion and geographical knowledge of the society. Due to the low number of lessons, the new content division and the direction of change are the key issues. In order to study these issues, two questionnaire surveys (Homoki & Sütő, 2011) were carried out the aims of which can be summarized as follows:

1. Considering the uncertainties regarding geographical knowledge elements and the deteriorating position of the subject the first survey focused on the following:
  - a) the extent of geographical knowledge of the various groups of the society and the difference between the knowledge of certain groups, primarily those with and without geographical qualification and those who studied geography recently and a long time ago,
  - b) the ability to use geographical knowledge in everyday life situations, and the strength of theoretical and practical knowledge (knowledge questionnaire),
  - c) stability of the physical and social geographical knowledge and abilities.
2. The second questionnaire survey focused on how the issues described above are reflected in the opinion of the society regarding:
  - a) the efficiency of knowledge taught in the subject of geography in practice,
  - b) and the position of geography as a subject (opinion questionnaire).
3. In the course of assessing the two surveys connections were searched between the status questions, the level of knowledge and the opinion on the subject. In the case of respondents filling both surveys, connections were investigated between the answers of the two surveys as well.

### **Methodology of Research**

#### *General Background of Research*

The survey was performed during the academic year 2009-2010 as part of the work of the Subcommittee on Geography Teaching, X. Section of Earth Sciences, Hungarian Academy of Sciences. The task of the authors was to measure the geography knowledge of the society, however, there were no standards available for this in Hungary. Therefore, the composition of the questionnaire and the organization of sampling were designed completely by the authors.

Two questionnaires described in the research plan were made in accordance with the subject position of geography and the knowledge of geography. The so called *knowledge questionnaire* contained 19 questions covering the secondary school graduation exam topics in geography (100/1997. (VI. 13.) korm. rendelet): geology, physical geography, orientation on maps, social and economic geography, regional geography, geography of Hungary and the analysis of global economics and environmental problems. The *opinion questionnaire* was composed of 6 questions, however, the number of answers was 159. The document contained closed-ended question partly with comparative ranking and partly with a semantic differential scale (Babbie, 2001). Questions included:

- the usefulness of the topics,
- the volume of the education,
- the position in the secondary school subject hierarchy,
- usefulness of the knowledge in the labour market,
- the role in forming certain attitudes;
- social usefulness of the knowledge of geography.



### Sample Selection

The population of Hungary was 10 014 324 people in 2010. At 95% confidence level with 2.5% error limit the size of the required sample would have been 1536 people. Unfortunately the questionnaires of 1218 people were returned by the deadline therefore the error limit was modified to 5%. Selection of the sample was performed using the multi-level group probability sampling procedure (Babbie, 2001). The number of processed samples is 1621: 968 for the knowledge and 653 for the opinion. Out of them 403 respondents (33%) filled both questionnaires.

The ratio of those giving no answer is high (~20%) in the case of all status questions indicating mistrust and fear for identification. Questionnaires were returned from 254 settlements. Ratio of the age group 19–25 years is highest (45.2%) (551 respondents), accordingly 51.1% and 30.1% of the respondents are involved in higher and public education respectively while 6.7% of them are entrepreneurs. Exception is presented by the geography students and it was indicated on the sheets: 15.7% of the respondents were qualified in or studied geography. Considering the high number of respondents, however, the results may be worth considering for those involved in education.

### Instrument and Procedures

The questionnaires were possible to fill both electronically and in paper based form. They were accessible via the website <http://www.surveygizmo.com>. Ratio of electronically submitted questionnaires is 34.7% equalling 562 pieces.

The questionnaires are suitable for researching social relations based on the status questions: according to social stratification (*age, qualification, parents' qualification, place of residence, geography grounding, etc.*) and task type, knowledge level and topics.

Analyses were carried out using the software SPSS 21.0. Nominal coding was used for processing data from most answers of the survey. Certain questions focused on static data or facts while others required the application of knowledge or the recognition of relations.

It was presumed as a hypothesis that the number of correct answers for questions requiring the application of knowledge given by the respondents qualified in or studied geography would be higher. On the other hand, the level of knowledge of those studying currently can be studied giving indirect data on whether the level of knowledge of geography students decreases or not.

Validity of the psychometric parameters was ensured in several ways. For reliability a preliminary survey with a small number of samples was carried out. Problems in the course of this were solved together with the notes of the professionals of the Subcommittee. Reliability is supported by the similar results of the survey of Útőné (2007), the student research applying the questionnaire of the authors and that of secondary school and college tests of the students of the authors. The final version of the two questionnaire types was regarded to be reliable on the basis of the Cronbach's Alpha tests (0.775 and 0.813) as well. Validity of the content of the questionnaires is based on that the tasks were composed according to the topics of the curriculum framework (EMMI decree 51/2012. (XII.21.) 2012) and the national curriculum (government decree 110/2012. (VI. 4.)), adjusted to the different knowledge levels.

### Data Analysis

Simple descriptive statistics (*dispersion, median, mode*) were studied and analysis of possible significant differences among variables was performed (Ketskeméty & Izsó, 2005) using the parameters from the status questions and between the answers of the two questionnaires if the replier was the same. Several tests ( $\chi^2$  test, phi coefficient, Cramer's V; Contingency Coefficient) produced similar results. Two of them were selected based on the literature. The  $\chi^2$  test and the phi coefficient of descriptive statistics analysis were chosen for showing correlation among the answers and age or geography qualification of the participants because these are nominal variables.

Teachers often presume that practical knowledge cannot be achieved without exact background knowledge. According to our experience, however, higher ratio of correct answers can be achieved in the case of practical questions even if the theoretical base is deficient if certain knowledge is present. This has to be considered by the establishment of practical education, as solving everyday life issues require such knowledge primarily. Based on this "if learning starts with a problem to be solved and the solution of this problem requires the obtaining of new knowledge" (Rocard et al., 2010) it may prove to be a great motivation for greater individual work investment.



## Results of Research

### *Earth Sciences Knowledge of the Society*

Based on the filled forms, correct answers were given in a ratio of 62% that equals 48% of average absolute performance for the entire sample. This could be regarded as a positive result – as it would count as a moderate and good grade in the intermediate and advanced level secondary school graduation exam respectively. Unfortunately the questions were associated with simple knowledge levels. Solution of the problems requiring procedural knowledge was poorer. Differences were analysed separately (Table 1).

**Table 1. Response willingness and the average ratio of correct answers, classified by topics in relation to absolute correct answers**

Major topics of geography subject	Number of answers	People	Average ratio of those filling the form (%)	Ratio of correct answers out of the previous column (%)	Absolute ratio of correct answers (%)
Geographical zonality	6	936	96.7	88.46	85.54
Demographic geography	4	794	82.05	72.8	59.71
Global problems	12	945	97.59	59.42	58.01
Hungary	12	595	61.3	76.6	47.08
European Union	15	745	77.03	61.09	47.02
Atmosphere	5	705	72.9	61.96	45.13
Changing social-economic view of world economy	9	784	80.97	55.18	44.69
Geology	18	722	74.62	56.9	42.44
Mapping	7	548	56.64	55.66	31.51
Hydrosphere	2	644	66.5	29.25	19.46
respondents	90	968	76.63	61.73	48.05

Most difficult was the topic of the **Hydrosphere**: the response rate is the third lowest and the absolute ratio of correct answers is the smallest (19.5%) (Table 1). The short, open end question was the date of the ice flood and that of the green flood (*March, June*). Considering the regular media coverage about floods inside and outside of the borders of Hungary, the problem was probably the individual reproduction of the knowledge. The question is closely associated with the knowledge of the physical geography of Hungary, thus, the result is even more problematic. The  $\chi^2$  test showed interdependence between geography qualification and the distribution (green flood:  $\chi^2(2) = 28.042$ ;  $\phi = 0.160$ ;  $p < 0.000$ ) of answers. This means that the knowledge does not survive the educational time even though its role in practical life is significant.

In the topic of **mapping**, the task was scale calculation requiring procedural knowledge. The difficulty of solution is indicated by the low response rate (Table 1) that is also proved by the rejection of the topic in the *opinion* questionnaire (low *applicability*). Justification for the solution was given only in 29%. 49% and 65% of the answers and justifications respectively are correct.

In the **geology** topic, knowledge on the history of the Earth was measured by multiple choice questions based on paleontological knowledge. Regarding petrology, a one-to-one correspondence task was given, each one for theoretical and everyday knowledge. In the former case, elements well-known from the media were classified with more success than those involved "only" in the curriculum. The response rate in petrology theory is lower (67%). It is 29% in the total sample with correct answers. The same ratios in the everyday part are 70% and 46%. This suggests that practice works without theoretical basis. According to the  $\chi^2$  test, there is a significant relationship between geographic qualification and the correct classification of rocks ( $\chi^2(6) = 20.50-40.74$ ;  $\phi = 0.10-0.186$ ;  $p < 0.000-0.004$ ). Consequently, respondents qualified in geography know the genetic classification of rocks better than ordinary people. However, geographic qualification is not an advantage in knowing how to use rocks except for bauxite ( $\chi^2(6) = 23.015$ ;  $\phi = 0.144$ ;  $p < 0.001$ ) and granite ( $\chi^2(6) = 13.75$ ;  $\phi = 0.107$ ;  $p < 0.033$ ) which people



rarely meet in everyday life. Low level of curriculum knowledge can be explained too by the theoretical character of geography teaching, the decrease of time for field trips and partly by teacher deficiencies. Recognition of usability does not mean necessarily that respondents would choose the correct rock for a required function. This could prove the lack of connecting theory and practice in public education.

In the **changing social-economic image of the economy of the World** topic, several tasks were compiled, since it involves actual and important information for the citizens to make decisions. This part of the survey can be regarded as the reformed traditional regional geography in Hungary. Its modern teaching has a past of 15 years therefore the results of the questionnaire seem to be reasonable. The correctness of the solutions, however, is fourth (44.7%) in the total sample and second lowest (55.2%) among the respondents (Table 1). This can be explained partly by the longer time interval required for the effects of educational changes. This result is an indication of why people cannot understand correctly the social and economic processes around them. Most of these people cannot incorporate the results of such processes in their life (family finance, employment, selection of residence, etc.). Although the educational reform is more associated with the actual knowledge than with the mechanical, topographic and sector based knowledge in the topic of regional geography, however, even the younger teacher generation cannot really break from these partly due to the deficiencies in skills for understanding and transferring relationships.

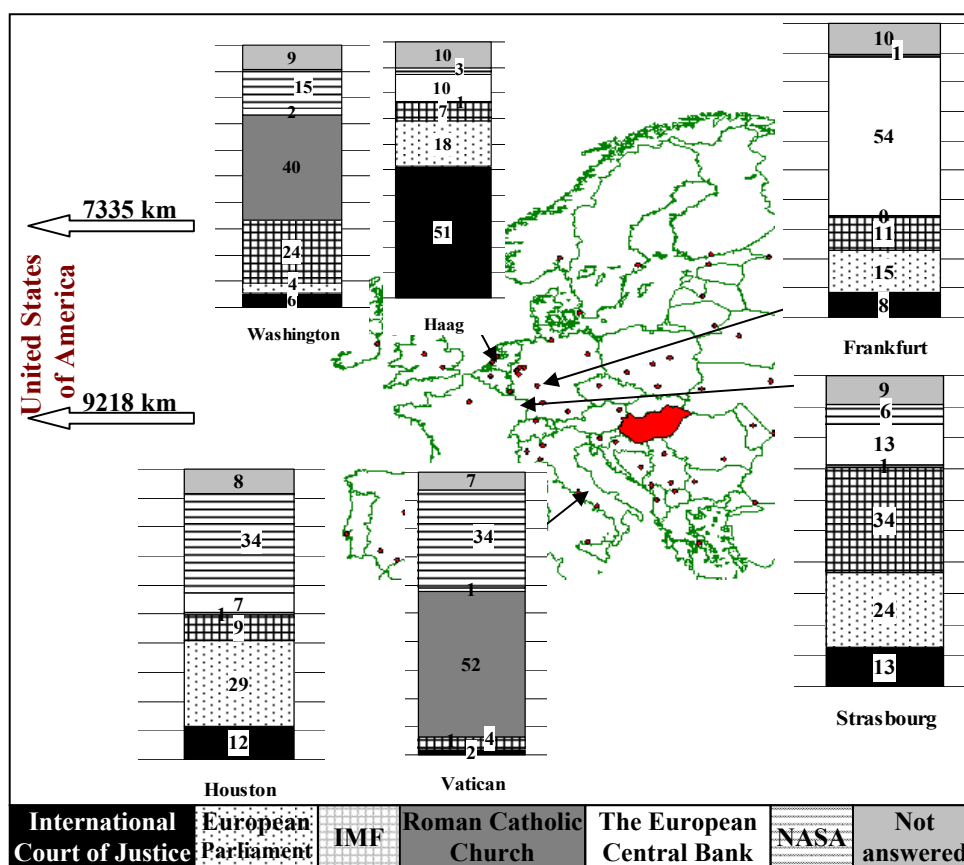


Figure 1: Ratio of classifying major organizations according to the host city.

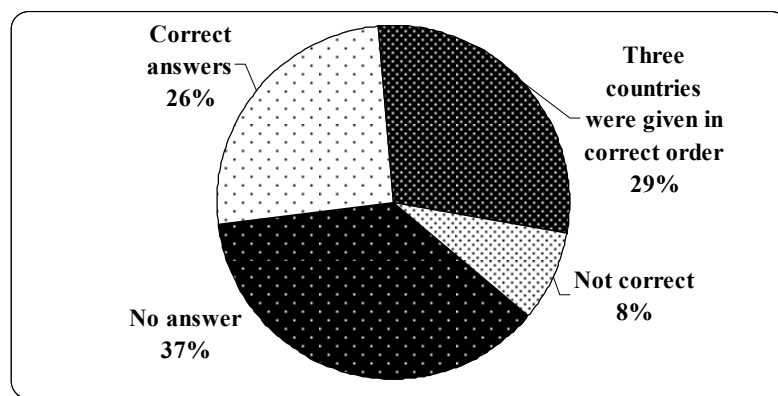
In the highlighted task major organizations had to be associated with central cities (Figure 1). Most correct answers were given in the case of the organizations belonging to Frankfurt, Haag and Vatican City. The 51% in the case of the latter is still regarded to be low – based on the representation of the Roman Catholic Church in the society – especially as 40% of the respondents selected Washington. Low grade of European identity is indicated by that the institutes of the European Union were not recognized clearly: highest values were scored by the EU Parliament at Houston and by the IMF at Strasbourg, despite the fact that the media give information on the role

of these organizations regularly. The further a city is found, the higher is the standard deviation of the results (Houston, Washington) (Figure 1). Vatican City and Houston received the equal amount of nomination as NASA centre indicating either a huge lack of basic literacy or the superficial opinion of the respondents. According to the  $\chi^2$  test, there is a relationship ( $\chi^2(5) = 20.283-49.681$ ;  $\phi=0.115-0.181$ ;  $p<0.000-0.001$ ) between geographic qualification and recognizing the roles of cities, except for Vatican City ( $\chi^2(5) = 5.262$ ;  $\phi=0.058$ ;  $p<0.385$ ).

For measuring knowledge about the **atmosphere**, a question series of alternative selection at conceptual knowledge level was prepared, associated with the weather forecast just like in news. The absolute ratio of correct answers was 45% (Table 1) that can be associated probably with the understanding of the phenomena.

Greatest failures were observed at naming and recognizing the signs of fronts (34% absolute ratio). Therefore, high level of weather forecasts seems to be useless as many people cannot interpret them correctly. This again proves the faulty relationship of theory and practice, the results of which were revealed at the time of the social handling of several hazards, caused by atmospheric disturbances. The understanding of such features and processes could prevent everyday accidents as well. Its close connection to physics knowledge has to be mentioned, the lack of which may have also contributed to the high ratio of incorrect answers.

There were several tasks in the **European Union** topic as well. A decade has passed since Hungary joined the EU. Average ratio of respondents giving correct answers is 47% like in the case of the complete sheet. In one of the tasks, the countries joining the EU at the time when Hungary did so had to be named. The absolute ratio of correct answers is 67.5%. In contrast, the ratio of correct answers for practical questions regarding the money of neighbouring countries and the conditions of border crossing is only 16%. This question requires procedural knowledge level. The results reveal that, although many people can recall mechanical knowledge, they do not know the practical consequences of joining the EU and the current state of the process. Deficiencies are shown by the fact, that listing the countries according to a given condition – listing neighbouring countries from the north – caused serious problems (26%). Most of the respondents (29%) could establish the order of only three countries (Figure 2). These countries were Slovakia, Ukraine and Romania.



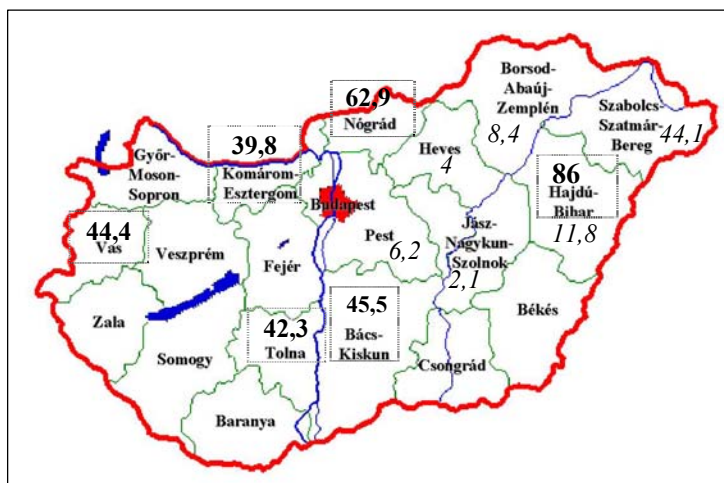
**Figure 2: Knowledge of the order of countries neighbouring Hungary.**

The ratio of correct answers for the interpretative questions is even much lower. Several factors may stand behind these results:

- most of the respondents (64.3%) live in East Hungary in the counties neighbouring the border with probably lower level of mobility than those living in West Hungary (Figure 3);
- answers show positive correlation to age and geographical qualification. In this case life experience helps the update of educational knowledge;
- the lack of up-to-date knowledge in relation to the expansion of the European Union and its consequences may prove to be a problem;
- lack of the practice orientated to education of the topic.

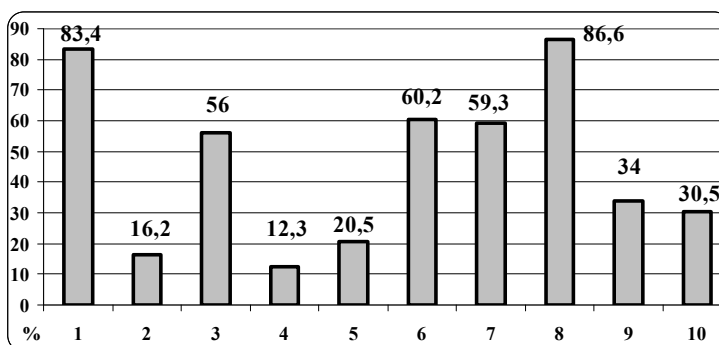






**Figure 3: Absolute ratio of naming the county centres (thick frame) and the ratio of the respondents according to the counties (*italic*).**

A combined exercise was given in the **Hungary** topic (open end question with a short answer, complemented by a Table) the solution of which required reproduction knowledge: the ratio of absolutely correct answers is 47% at 61.3% of response rate. Correct naming of county centres in the western part of the country is lower – due to the dominance of respondents from the eastern part of the country. This means, that the naming of county centres further away from the residence of the respondents causes greater problem (Figure 3). 17% more of the respondents knew the county centres than the sights worth visiting (68–85%) and a part of these sights can be regarded either as teaching and tabloid material than real monuments or values.



**Figure 4: Choosing global problems from the listed phenomena (*multiple choices*).**

**Legends:** 1. green-house effect, 2. debt crisis, 3. overpopulation, 4. earthquake, 5. flooding, 6. deforestation, 7. wasting resources, 8. environmental pollution, 9. globalization, 10. famine

Success of raising the environmental awareness of the community is indicated by the 97.6% response rate for the questions related to environmental protection. The result can be also explained – partly – by the simpler types of questions. The second pillar for raising and modifying environmental awareness, geographical and environmental knowledge for solving problems is much less available for the respondents (59.4% of correct answers). In the case of the simple choice for the effect of transport methods (railway, airplane, bus), not geographical qualification but age corresponded well with the distribution of the answers. Correct answers (selecting railway) increase with age, while 18% of the age group 19–25 selected airplane as the transport method with less pollution.

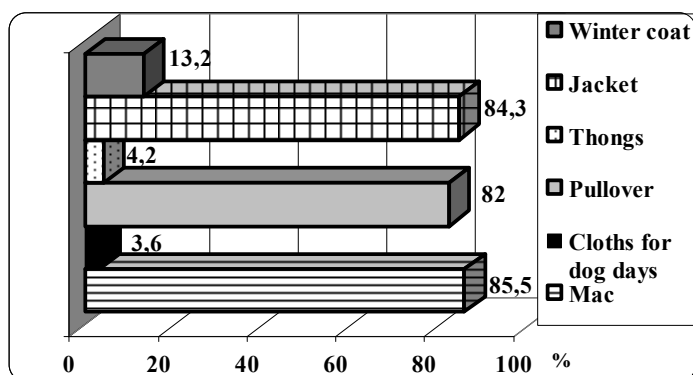
**Table 2.** Searching for correlation among variables (*phi-coefficient*).

Global problem	Geographical qualification	Age group (year)	Global problem	Geographical qualification	Age group (year)
Green-house effects	Phi=0.011 $p < 0.667$	Phi=0.113 $p < 0.000$	Deforestation	Phi=0.030 $p < 0.230$	Phi=0.141 $p < 0.000$
Debt crisis	Phi=0.010 $p < 0.699$	Phi=0.051 $p < 0.368$	Wasting resources	Phi=0.040 $p < 0.102$	Phi=0.139 $p < 0.000$
Overpopulation	Phi=0.111 $p < 0.000$	Phi=0.110 $p < 0.001$	Environmental pollution	Phi=0.022 $p < 0.368$	Phi=0.086 $p < 0.017$
Earthquake	Phi=0.059 $p < 0.017$	Phi=0.094 $p < 0.006$	Globalization	Phi=0.025 $p < 0.320$	Phi=0.094 $p < 0.007$
Flooding	Phi=0.072 $p < 0.004$	Phi=0.115 $p < 0.000$	Famine	Phi=0.102 $p < 0.000$	Phi=0.102 $p < 0.002$

The selection of global problems from the listed answers requires conceptual knowledge level, however, it can be regarded as difficult since it is hard to make the decision without knowing the correlations (e.g. green-house effect, debt crisis, famine) (Figure 4). The absolute ratio of correct answers of 54.7% verifies the above conclusions. In certain cases age is more significant than the learnt material in the increase of correct answers (e.g. flooding, overpopulation) (Table 2).

In the **demographic geography** topic the alternative selection question type was related to the demographic situation of Hungary. Both the response rate and the ratio of correct answers are high (absolute ratio of correct answers is 59.7%) (Table1). Demographic issues are widely discussed in the media. The question in the survey is conceptual, which can explain the extremely high ratio of correct answers for the first three questions (80%). The split opinion (52.3%) for the fourth question – “Are school closures affecting the consequences of natural population decrease as well?” – indicate the responsibility of education in transmitting knowledge in a form applicable in everyday life.

The ratio of correct answers to the conceptual multiple choice associated with **physical geographical zonality** was the highest (85.5%) (Table1). Answers can be somewhat subjective due to the different temperature sensation of individuals (Figure 5). Despite this, the uniform character of the answers proves that most of the respondents were able to apply their knowledge for practice in the given situation.

**Figure 5:** Choosing useful tools for a summer trip to Scotland (*multiple choices*).

#### *Opinion on the Usefulness of Earth Scientific Knowledge and its Education*

The *opinion* questionnaire focused on the situation of geography as a subject, the educational usefulness and depth of the teaching of geographical topics and their usability in everyday life. The questionnaire was taken from the PhD theses of Ütőné (2007). In the subject of the assessment we had to consider how the fact, that the



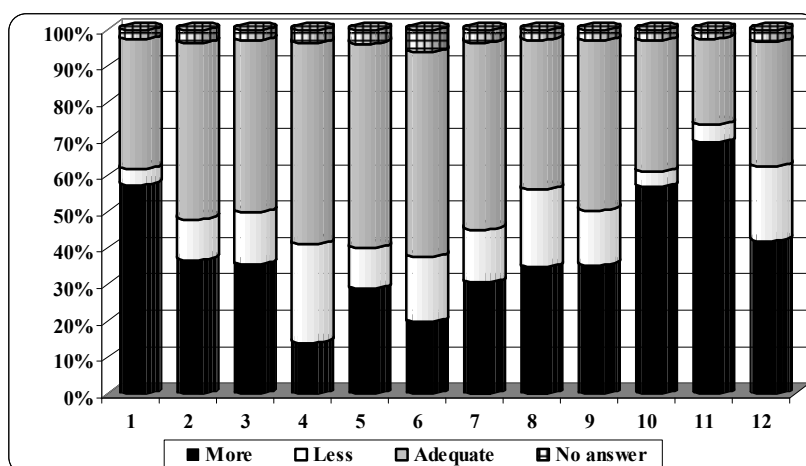


respondents knew that the results were to be applied for the geography subject, influenced – probably positively – the results.

According to the question about the respondents' opinion on the number of lessons for the topics of the geography subject, the amount of teaching topography, atmosphere, hydrosphere and regional physical geography is adequate (getting 5% rejection). Whereas, the topics of astronomy, regional economic geography, general social geography and public economy basics are shared between the answers adequate and need to be thought more. The topic lithosphere has special position, while it has stable acceptance, it has the highest ratio (27%) of rejection as well. The topics mapping, Hungary, environmental protection need to have more important roles in the curriculum (Figure 6).

Answers for everyday relations give a more detailed view as respondents consider the topics of *mapping, geography of Hungary, World economy and public economy knowledge* useful in practice. A significant problem is revealed by the fact that only a few respondents selected the knowledge of the geospheres (~26%) (Figure 5), although without these the understanding and management of environmental problems are impossible. State of the borders and the possibility of trips to various countries enable us to get acquainted with the natural and cultural values of the countries while the average ratio of the usefulness of regional geographical knowledge is 39.4%.

In the matrix forming the closing question of the *opinion* questionnaire the topic had to be selected the knowledge of which was most useful in given fields of life (*travel, doing crosswords, understanding news, household works, environmental protection, etc.*). Answers were contradictory to the results discussed above in many cases. This indicates that many people are not aware of the current content of geography, however, they demand knowledge required for the orientation in the natural and social space that indicates the spatial interpretation level of facts and relationships occurring in the selected application fields. In comparison, knowledge required for the understanding of news was indicated by more than 50% of the respondents only in the case of regional and general social geography while the former was selected as useful in everyday life only by 40% of the respondents. Outstanding usefulness (Figure 6) of knowledge associated with Hungary and environmental protection and its recommendation for increasing the teaching material were accompanied by 40% of usefulness in news. Lithospheric processes are regarded to be important in understanding news only by 14% while information on natural hazards, raw material, etc. is abundant. The absolute ratio of those considering the necessity of topographic knowledge is only 30% while most information is associated with a geographical location and furthermore, the lack of identifying the location would make the understanding of the content of news programmes difficult. Relationship between educational and everyday role of the environmental protection topic was put under a  $\chi^2$  test. According to the result, the two elements have small correlation. There is only small correlation with the understanding of the content of news programmes and with the hobby of the respondents ( $\chi^2(2) = 7.66$ ;  $\phi = 0.115$ ;  $p < 0.022$ ), and slightly stronger correlation with the choice of profession ( $\chi^2(2) = 19.168$ ;  $\phi = 0.182$ ;  $p < 0.000$ ).



**Figure 6: Opinion on the number of lessons for the topics of the geography subject.**

**Legends:** 1. mapping, 2. topography, 3. astronomy, 4. lithosphere, 5. atmosphere, 6. hydrosphere, 7. regional physical geography, 8. regional economic geography, 9. general social geography, 10. Hungary, 11. environmental protection, 12. public economy basics



The position of a subject in the subject network is influenced by several factors out of which nowadays the role of the subject in further education is the most important for both pupils and parents. Placing the subjects on a rank of ten, the more important subjects scored lower values. Geography is the fourth in the rank of subjects following foreign language, informatics and mathematics (Figure 7). Real order formed only in the places 1-5. Received scores above them show limited standard deviation.

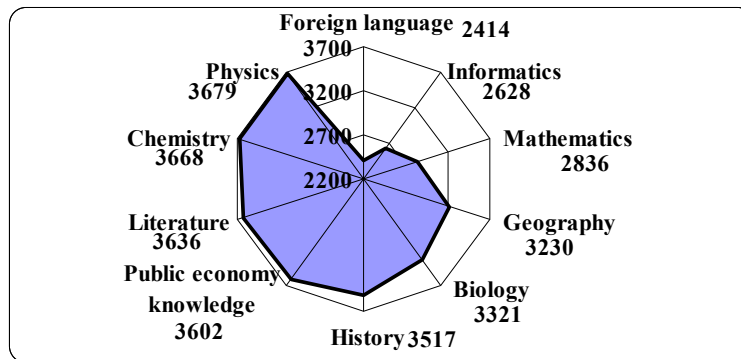


Figure 7: Score of subjects based on their usefulness in everyday life.

The first position of the foreign language seems to be justified due to the labour market demands, however, the majority of the population cannot practise this ability in everyday life. It is positive that geography received the best position among other subjects.

A slight contradiction is present in the fact that the geographical knowledge is regarded to be important and very important by an average of 40% of the respondents considering occupation (Figure 8). Even in the case of their own occupation while the ratio of geography qualification is only 15.7%. This means that the knowledge of the subject seems to be more necessary in labour market than the hierarchy distorted of further education.

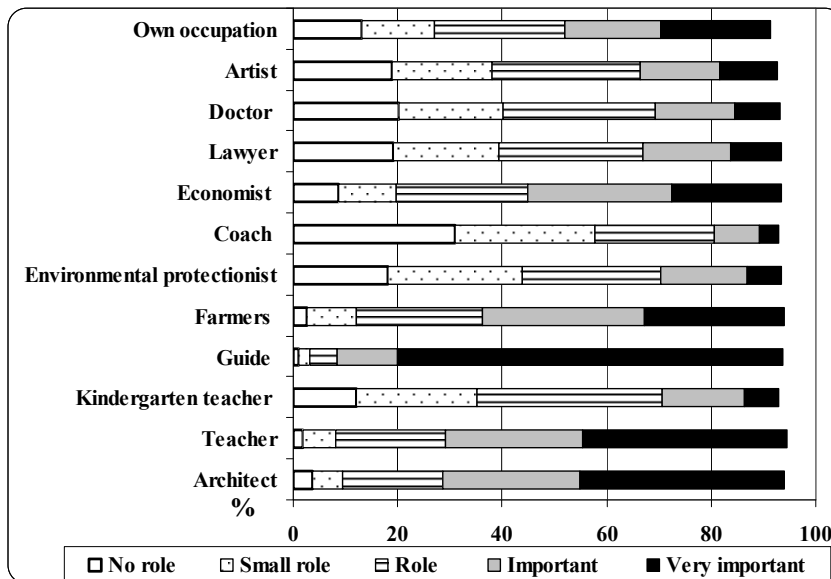


Figure 8: Opinion on the role of geographical knowledge according to occupation.



## Discussion

Knowledge of geography as a subject and the opinion of the society about it are ambiguous. Several papers drew attention to the fact (Turner, 2002; Haggett, 2006; Farkas & Hoyk, 2012) that the knowledge of geography is to be taken by subjects - scientific fields that are not dealing with it at higher education level or that have no public educational role as a result of uncertainties in the scientific field classification and in the curriculum of geography. This dissonance is strengthened by the knowledge of the decision maker, age group originators and their static geography teaching experience supported by several misconcepts as seen in the similar questionnaire survey of Útőné (2002) and the curriculum analysis of Dobány (2014).

One of the major problems associated with the issue – supported by the poorer results of the knowledge questionnaire and the answers of the opinion questionnaire – is the deteriorating educational situation described in English-speaking countries (Dobson, 2007, 2011; Farkas & Hoyk, 2012). Somewhat contradictory is the opinion of the applicability of geographical knowledge stabilized contrary to the deteriorating educational conditions (Útőné, 2005).

However, this can be interpreted in several ways. One of the reasons could be that geographical information appears frequently in the media and its knowledge seems to be easy to take when studied superficially. On the other hand, most people are not persistent enough to achieve the understanding of correlations and the prestige of geography as a subject and as a science is low.

The required extension of the covered knowledge and practical usefulness cannot be satisfied due to the reduction of the number of lessons, the lack of equipment and the increase of the pedagogical tasks of teachers. In several schools geography lessons were held in the minimum 4% (1 hour a week) determined by Government Decree (110/2012. évi (VI. 4.) korm. rendelet). Several general public educational contradictions can be in the background of all these. The fact that the content and methods of natural scientific training needs development is confirmed via social channels, however, public educational documents reflect different measures (51/2012. (XII.21.) EMMI rendelet). Geography teaching in Hungary still focuses on encyclopaedic knowledge even though reform efforts were started more than a decade ago. This can be explained probably by the unchanged material and methodology of teachers' training and this is a problem in other countries as well (Lamauskas, 2012).

As a result of reforms, the lessons of environmental science that would provide basis for the later teaching of physics, chemistry, biology and geography were reduced by one in the case of pupils at 1-4 level (Lamauskas, 2012) when children are most receptive (Fisher, 2002) and their long-term interest can be influenced most. If children at this age do not hear and experience anything interesting related to their environment, it will be too late by the time they turn 12 and start learning separate natural scientific subjects as their interest can be shaped and turned much harder. This is why it seems solicitous that geographical knowledge is regarded to be less important in the cases of kindergarten teacher and environmental protection jobs in the opinion questionnaire.

For successful competency development other, not geographical – primarily natural scientific and mathematic – abilities are also required due to synergic effects. This is proved by the fact, that the lack of other natural scientific basic knowledge and the problem of teaching theory type knowledge are indicated by the poor rate of solution of the geological tasks.

Lack of mathematic knowledge is also indicated by the solutions of mapping and demographic tasks in the questionnaire. That is a problem not only in Hungary (OECD, 2013b) but in other neighbouring countries like Croatia and Romania as well. However, proportions are learnt in primary school and changes between units are learnt in the early levels of elementary school. This supports the role of concentration between subjects as for example geography calculations could be solved in mathematic subjects. Regarding the mapping task, neither age nor geographic qualification show significant connection to the result. This indicates that most of the geography students have poor mathematic knowledge as well as Ádám et al. (2008a) diagnosed the same at other sciences. Probably comprehension problems explain the contradictions experienced among the solutions of questions of knowledge level higher than conceptual knowledge. These could influence professional knowledge as well – as described in other surveys as well (Balázs, Ostorics, Szalay, Szepesi & Vadász, 2013). This may present a serious disadvantage considering the complexity of Earth scientific occupations (Farkas & Hoyk, 2012). These are also proved by the results staying below 50% of the questionnaire containing mainly conceptual tasks.

Solution of these general problems is also associated with the problem of lesson numbers. In Finland that achieved the best results in Europe in the PISA survey pupils at level 4 have natural scientific lessons of 8 per week (Ádám et al., 2008b). Even half that value would be a step forward in Hungary providing greater space



to teach Earth sciences that would also improve the renewal of the applied methods. The quality of teacher's training has also been a problem long ago. Ratio of correct answers in the total sample is 61% (47%) while this number is 10% higher in the case of those having geography qualification (58.7%). This is how much studying and specializing into geography mean today? The problem is that this difference is achieved with solving question types of low level of required knowledge.

Deficiencies in the questionnaire results indicate shortfall on the students' side as well who study to become geography teachers. This is accompanied by the slowly decreasing number of students although with a shift in time compared to other natural sciences. Prestige of geography among teachers teaching other subjects is doubtful as it was proved by the research of Útőné (2007). 60% of teachers not specialized in geography feel that they have the knowledge to teach geography. This does not mean the knowledge level that is thought due to the complexity of geographical knowledge, the basic use of such knowledge in everyday life and the above discussed misconcepts. Even so only 3% of them consult regularly with geography teacher colleagues but the reverse is also true. Connecting knowledge to other subjects in the related branches of knowledge requires higher level of knowledge from geography teachers as well and this can be difficult especially for single-subject teachers. These are indicated by the small difference between the results of those with geographical qualification and that of those without it regarding the knowledge questionnaire.

Knowledge of the domestic country is a high educational priority. However, for this it should be taught in a different way and not in such small number of lessons in secondary school – 14 lessons over the entire secondary school time period (EMMI decree 51/2012. (XII. 21.) 2012). Lack of practice and superficial knowledge of the home country extending over several subjects are shown by the fact. This is why education in elementary school starts with experiencing the immediate surroundings and generalization is only dealt with in secondary education, for the support of this, however, geography for level 3 and 4 secondary school students is missing. The fact that centres are known better than the visitor attraction sites contradicts to competence based education. In the answers outdated industrial topographic names are given instead of knowledge useable in everyday life – like visitor attractions for example.

Inconsiderateness of the answers is revealed in the correlation studies. In our opinion, the slight statistic connection between the time of teaching environmental protection and that between hobby and the understanding of news are the result of respondents with geography qualification. On the other hand, the lack of statistic relationship in the case of personal topics (garden, travel, trekking, etc.) indicates that many people cannot connect the protection of their environment and the importance of the environmental attitude. The lack of connection between the environmental protection occupation and the geographical knowledge supports the popular social opinion that environmental activities are based more on emotional than on professional bases.

The role of stereotypes and subjectivity influencing the prestige of the subject is also interesting in the case of several tasks. Meanwhile, results associated with weather knowledge are poor, probably people decided on the basis of stereotypes, in the case of the task associated with weather, as Scotland would be a foggy, cold place in their virtual World. This image is supported by films as well raising the importance of frequent educational application of correct geographical algorithms.

Answers associated with demographic geography indicate the role of subjectivity overprinting knowledge. These can be explained also by the fact that the majority cannot prescind from the subjective life conditions when social-political decisions have to be made. However, geographical bases – reducing demographic trends in Hungary in this case – were taught to everyone. These terms, however, are not used correctly in the media that may lead to the improper treating of the problem reducing the responsibility of the individual or even the social decision makers. If solution oriented education incorporates the effects on the everyday life of the taught processes, the demographic knowledge could contribute for example to the understanding of the labour market or even the health management processes as well.

## Conclusions

Earth sciences are in an educational crisis despite its bridge role between natural and social sciences and despite its history dating back to Antiquity. There is a demand to extend the knowledge taught in geography subject, however, the opposite is taking place over the currently executed educational reforms. This is somewhat surprising considering its knowledge used in everyday life. Therefore, knowledge and opinion questionnaire surveys were conducted in order to study the situation of the geography subject with a glance at some ele-



ments of the education of other natural sciences. The sample composed of 1218 people seems to be suitable for estimating conclusions at national levels from several aspects for which descriptive statistic analyses were also carried out. Based on the results of the questionnaires and our own experience the following factors are considered important:

- Based on the first major question of the aims, the poor results of respondents with geography training reveal the problems of methodical reforms in higher education. Although students studying geography solved the tasks of the questionnaire more successfully they had difficulties with questions requiring competencies from other fields like mathematics for example. Response rate was smaller and the ratio of correct answers was also smaller in the cases of subfields that require deeper knowledge like hydrology, geology, cartography or even Hungary or the European Union topics. The lack of ability to connect Earth scientific knowledge elements limits the formation of a real view of the spatial geographical units (landscapes, countries, regions).
- Another conclusion based on the results of both questionnaires is that a part of geographical knowledge is incorporated into the human mind from everyday life, therefore they do not think of its connection to the geography subject when they apply it. Certain knowledge is considered to be useless in everyday life – for example astronomy, petrology – while the natural scientific World concept is and will be in crisis. Meanwhile the new and renewed topics of the geography subject have not been integrated into public knowledge yet (environmental protection, money market, change in the approach of social geography), based on the answers. Traditional lexical knowledge cannot be maintained regarding everyday life if the development of spatial skills is part of mobile communication. Up-to-date information is missing even in the case of respondents with geography qualification (static teaching, static knowledge) due to the slow reform processes described above.
- The difference between the knowledge level of physical and social geography cannot be determined undoubtedly. It is important to note that even though the classification of geography as a subject into natural sciences is ambiguous, its public educational role cannot be treated independent from them, because if other natural sciences are underrepresented in education, the understanding of not only physical geographical but associated social geographical knowledge will become difficult. Greater rejection of geological, physical, geographical contents shows the difficulty of their study. However, respondents were better in the solution of the social geographical tasks (considered to be easier) only at lower knowledge levels. Analysing the answers for the tasks related directly or indirectly to Hungary, the superficial knowledge of the current conditions, location and famous sites is a serious problem and this can have an important role in the development of an unrealistic social view and demands.

Changes in the prestige of geography are difficult to prove. Deteriorating educational conditions influence both the analysed knowledge level and the opinion of the society. Geography is not compulsory among the school leaving exams, taken into account, in the admission to higher education. It is only counted in the case of earth sciences and environmental sciences trainings. Geography is not considered in the admission process to major economic trainings, even though its related knowledge has been modernized for public education. Therefore, it is no surprise that geography is only the sixth subject considering further education in the pupil and parent priorities based on the opinion questionnaire. This place, however, is the best among natural sciences. Its situation is expected to further decrease with the elimination of the preliminary school leaving examination. Its rank a decade ago when its usefulness in everyday life was regarded to be better is opposing this, but the preservation of this rank requires methods to integrate everyday life – news, films, mobile phone, etc – into the process of teaching. The improvement of the proper use of information sources related to geography and the bringing closer of the knowledge of the subject to the labour market are also important issues. The way to make pupils understand the basic connections between social-economic problems, also to make the related decisions and behaviour more conscious and to develop a positive attitude towards Hungary has to be found.

Studying the relationship of knowledge elements, subject opinions and status questions, the results were influenced by the age and geographical qualification of the respondents. Statistic relationship was proved to be less close in the case of answers requiring higher knowledge level. Correlations between the knowledge levels and opinions of the two questionnaires were incidental, proving the theoretical character of education. Based on the answers given in the social-environmental topics, geography could have a significant influence on the attitude associated with actual problems, if it received lessons at higher age-groups. The actuality of this is sup-





ported by that the educational reform of the new concept of environmental issues or the World economy has not been completed yet and the results of this renewal will produce effects in over a decade time.

The reform of the curriculum, started from professionals of earth sciences higher education is a very important element in the renewal of geography as a subject, however, it is not enough in itself – even though the professional knowledge of the participants is acknowledged – it represents one side of the coin. Other important aspects would include labour market requirements, demands of the teachers and the society in order to help shifting the emphasis from theory to practice and to make knowledge transfer more effective. Moderate average results for the lower knowledge level tasks could be regarded as good, but the ratio of response elements of simpler knowledge was so high that results seem to be poorer than moderate. Development of knowledge suitable to enhance thinking and creativity can be successful only via serious renewal regarding both methodology and content.

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Received: April 11, 2014

Accepted: June 12, 2014

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