

Geography from screens to streets—Navigating digital natives into real world

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Abstract

Geography curricula in Poland is overburdened with facts as a result of encyclopedic approach. The aim of this paper is identification of topics students from “digital natives” generation evaluate as practical and supporting understanding mechanisms moving the world around us. Computer-assisted personal interviews survey conducted among students of last 2 grades of high schools (17-19 years old). A total of 592 students completed the form. The findings indicate a noticeable disparity in the evaluation of topics from the two branches of geography. Generally, topics related to physical geography are viewed as the least relevant to everyday life, while topics within human geography are considered more useful. The diversity of assessment level was found in groups divided by gender. Girls rated slightly higher physical geography issues and lower for human geography. Results show that generally students disfavor topics which are connected with taxonomy, systematics or classification of objects. Topics in human geography are perceived as more practical and relevant. This view likely arises because human geography deals with social, economic, and cultural phenomena frequently encountered in everyday life. Such knowledge offers insights issues, which are directly applicable and immediately relevant to students. Student feedback should be critically evaluated by geography curriculum developers from generation of ‘digital immigrants’. It highlights the need to update certain subjects and reframe content to shift from descriptive, fact-based teaching, which may not appeal to the “digital natives” generation. Instead, there should be a move toward problem-based teaching that encourages critical thinking.

Keywords: geography curricula, education, high school, Poland, gender, digital Immigrants

INTRODUCTION

As the world’s economies and societies have evolved education has become crucial to social progress. In order to provide quality education that enables younger generations to contribute to the global economy, proper educational systems with their implementation are essential (Gradstein & Justman, 2002; Rodzoś, 2022; Spillane et al., 2002; Viennet & Pont, 2017).

The literature reveals a number of barriers that prevent the effective implementation of changes in educational systems, as well as specific educational requirements (Gradstein & Justman, 2002; Viennet & Pont, 2017). Among other things, attention should be paid to how to implement the processes at the stage of defining education policy at the system level, and the

lack of recognition that these processes require the involvement of experts from the very beginning.

Above all, however, there is a lack of review of how to implement changes, as well as educational content, and how to adapt them to the needs of modern complex management systems, as well as the generation of “digital natives”. It would be necessary to adjust the formation of 21st century educational policies to support the development of future generations, enabling them to achieve success in professional, social and private areas.

Polish school has been the subject of reform since 1989. The democratization of social and economic life forced changes in education. It was then covered by an austerity program which resulted in a reduction in the number of lessons in elementary schools, and was aimed at improving the quality of schools, equalizing educational opportunities - especially for rural children,

Contribution to the literature

- The result of this study is the identification of topics that students of the “digital natives” generation rate as practical and supportive of understanding the mechanisms that move the world around us.
- This study allows us to identify content that will best serve cause-and-effect thinking and teaching geography in an interesting, non-factual way.
- The long-term effect may be to show how to educate a generation capable of solving problems in geographical space and conscious management of the earth’s resources.

as well as spreading secondary and higher education. Another system reforms were implemented in 1999 and in 2009. A new core curriculum was also introduced. Starting in 2017, the next reform of the school system began in stages. Again the structure of schools has changed. In 2019, the core curriculum in primary and high schools has been revised once again, and more changes are coming in 2024. All the reforms entailed rewriting the educational requirements, as well as forcing changes in textbooks and adjustments to teaching methods. The changes introduced in the education system in Poland have not been without impact on the place and position of geography in the school system (Rodzoś, 2022; Szczepanek, 2018; Tracz & Świątek, 2015). Changes in education, regardless of the context and scope, are undertaken with the hope that the results will be positively oriented. However, this is not always successful. In relation to the most recent reform of Polish education (in 2017) deficiencies are confirmed by a report published in May 2019 by the Supreme Audit Office (NIK, 2024; Szczepanek, 2018) which presented a long list of objections to the manner and nature of the changes. The report states the unreliability of the changes prepared and implemented.

Doubts are raised about the process of preparing the new core curricula, as they are not adapted to the capabilities of students. Moreover, only 20 percent of the experts drafting them were recommended by institutions related to the educational system. The others were chosen by the Minister in an autonomous manner. The Minister unreliably drew up contracts with the experts drafting the assumptions for the core curricula, without indicating what type of schools and classes the curriculum content contained in the assumptions would apply to. The contracts were limited to a general statement that was about creating curriculum assumptions for a particular subject. This may have hindered the substantive reception of the work, especially in terms of its completeness (<https://www.nik.gov.pl/aktualnosci/reforma-oswiaty-w-czesci-sfinansowana-przez-samorzad.html>). For these reasons, among others, the geography core curriculum contains many inaccuracies, is chaotically written in many places, and its content corresponds neither to the current state of knowledge nor to the needs of the modern generation of students (Minister of National Education, 2017).

The overriding goal of education is the well-being of the student, understood as his inner development and preparation for smooth functioning in life. Accordingly, the priority task is to help the student understand the modern world and to form attitudes and various skills that will allow a young person to cope with new situations.

The organization of the educational process, that is, the selection of content, methods, didactic means and the language of communication should take place in accordance with the student’s perceptual abilities and interests (Minister of National Education, 2017; Tracz, 2014). School knowledge should be simplified in relation to scientific knowledge. The desirable directions activities, giving the opportunity to learn not only isolated facts but whole mechanisms of various processes are:

- avoiding an excess of information,
- combining individual issues into logical structures,
- showing causal, temporal and functional connections between the phenomena presented,
- embedding newly learned knowledge in the context of previously held knowledge,
- indicating the relationship between the various components of the geographical environment, including between man and nature, and
- referring to the student’s life experiences (Minister of National Education, 2017; Tracz, 2014).

It is advisable to translate learned facts into concrete situations from the student’s immediate environment. This increases the usefulness of knowledge and motivates young people to further cognitive effort (Rodzoś, 2022; Tracz, 2014; Urbańska et al., 2022).

The implementation of the theoretical basis is carried out through the appropriate construction of educational programs, textbooks and the adoption of a specific teaching style. However, it should be remembered that the transfer of knowledge to the level of practice does not happen automatically (Tracz, 2014). It is a long and difficult process that requires understanding the need for transformation and working to change the way of thinking about the student and the tasks of the school and geography lessons towards him.

Teaching geography at school is one form of the process of geographical education of society. Over the past several decades, geography curricula have undergone significant transformations in terms of educational content. The reasons for these changes can be traced to three main sources, i.e., the development of geography as a scientific discipline, civilizational changes and the concepts and theoretical foundations of education developed by pedagogy. These three groups of factors interact with each other and intertwine, finding their reflection in curricula, as well as in the concepts of school geography textbooks (Tracz, 2014).

A major problem in Polish geographical education is teacher training (Szkurlat et al., 2022a). Frequently changed standards of academic preparation of teaching staff, organizational and curricular transformations result in teacher shortages and insufficient competence (Groenwald et al., 2008; Szkurlat et al., 2022a).

It would be necessary to consider how to meet all these challenges. Geography deals with human-environment interactions with key issues affecting societies, such as natural hazards, climate change impacts, energy supply, migration, land use, urbanization, etc. (Urbańska et al., 2022). For this reason, geographical education seems as relevant as possible to the lives and functioning of future generations. In addition, research shows (Kopeć, 2007; Piróg, 2018; Szkurlat et al., 2022b) that geography is a well-liked, interesting subject, appreciated by students, and a popular choice for exams (Smolik, 2024).

The purpose of this article is to analyze the geography core curriculum for secondary schools to identify geography topics that students rate as practical and supportive of understanding the mechanisms that move the world around us. This will lead to the identification of content that will best serve cause-and-effect thinking, teaching geography in an engaging, non-factual way to develop a generation capable of solving problems in geographical space and consciously managing the earth's resources in the context of Poland's upcoming next school curriculum reform.

MATERIALS AND METHODS

Computer-assisted personal interviews was used to collect the information. Students of 3rd and 4th grades of high schools (17-19 years old) used a tablet, mobile phone or a computer to record answers given during the interview. The participants were recruited for the study online through a form sent to Polish schools and teachers. The survey covered schools whose students participate in the Geographic Olympiad as well as the great test of geographic knowledge every year. A total of 592 students completed online Google Forms shared via email. Data collection began in April 2024 and ended in mid-May 2024. The survey (form) consisted of 4 extended questions. Topics for the survey were selected

from the geography core curriculum in the manner of computer randomization. The topics were first grouped into categories based on geographical disciplines (e.g., geomorphology, climatology) and then drawn from these 'draw pots' to ensure a balanced representation across the fields of geography.

Questions

1. Evaluate the usefulness of the following in terms of their practical application both in everyday life and in understanding the relationships taking place in the natural and socio-economic environment (answers collected on a 5-point Likert scale) (**Topics:** the impact of sea currents on human life and economy; effects of volcanic eruptions; coastal types; soil horizons and soil profile; colonialism, colonial areas of European countries; causes of changes in world population; causes and consequences of the population aging process; calculating the height of the sun above the horizon; the earth's magnetic field; constant, periodic, local winds; types of mountain glaciers; refugee problems in Europe and other regions of the world; causes and effects of urbanization; the degree of use of biological resources of seas and inland waters and the balance of aquatic ecosystems; financial centers around the world; pilgrimage sites; impact of agricultural activities on the natural environment; geological units in Poland; causes, effects and areas of desertification; reducing hunger and malnutrition; river regimes; relationships between climate and the occurrence of soil types and plant formations in a zonal system; revitalization, examples of revitalization processes of degraded areas; values and functions of forests; and selected armed conflicts).
2. List the issues (a minimum of 3) discussed in geography lessons that seem important to you in your life outside of school and then give an example of their practical use (open-ended question).
3. List the issues (a minimum of 3) discussed in geography lessons that allow you to best understand the relationships and dependencies occurring in the natural and socio-economic environment (open-ended question).
4. List the issues (a minimum of 3) discussed in geography lessons that seem most impractical and unnecessary to you (open-ended question).

Moreover, the questionnaire included information about the respondents (gender, place of residence, voivodeship, level of geography teaching (basic/extended), intention to pass geography in the high school graduation exam). Information on the respondents is presented in **Table 1**.

Responses were counted and analyzed using a quantitative approach to obtain information on issues

Table 1. Information on the surveyed students (n = 592)

| Characteristics | n | P (%) |
|--|-----|-------|
| Gender | | |
| Male | 315 | 53.2 |
| Female | 218 | 36.8 |
| Not marked | 40 | 6.8 |
| Non-binary person | 19 | 3.2 |
| Place of residence | | |
| Village | 201 | 34.0 |
| Small city (up to 20,000 residents) | 97 | 16.4 |
| Medium-sized city (20,000 to 100,000 residents) | 101 | 17.1 |
| Large city (over 100,000 residents) | 193 | 32.6 |
| Voivodeship–Province | | |
| Dolnośląskie–Lower Silesian | 8 | 1.4 |
| Kujawsko-Pomorskie–Kuyavian-Pomeranian | 253 | 42.7 |
| Lubuskie–Lublin | 53 | 9.0 |
| Lubuskie–Lubuskie | 0 | 0.0 |
| Łódzkie–Łódź | 97 | 16.4 |
| Małopolskie–Lesser Poland | 3 | 0.5 |
| Mazowieckie–Mazovian | 8 | 1.4 |
| Opolskie–Opole | 3 | 0.5 |
| Podkarpackie–Podkarpackie | 15 | 2.5 |
| Podlaskie–Podlaskie | 4 | 0.7 |
| Pomorskie–Pomeranian | 72 | 12.2 |
| Śląskie–Silesian | 4 | 0.7 |
| Świętokrzyskie–Świętokrzyskie | 0 | 0.0 |
| Warmińsko-Mazurskie–Warmian-Mazurian | 7 | 1.2 |
| Wielkopolskie–Greater Poland | 53 | 9.0 |
| Zachodniopomorskie–West Pomeranian | 12 | 2.0 |
| Level of geography teaching | | |
| Basic | 203 | 34.3 |
| Extended | 389 | 65.7 |
| Intention to pass geography in the high school graduation exam (matura) | | |
| Yes | 230 | 38.9 |
| No | 223 | 37.7 |
| Not sure | 139 | 23.5 |

Note. n: Number of indications & P: Percentage

that are practical and useful and those that are impractical and useless according to participants.

Data and statistical analyses were conducted using PAST (Hammer et al., 2001) software programs. Overall average values for assessing the practical usefulness of individual geographical issues were studied and analysis of possible significant differences among variables was performed through analysis of variance (ANOVA). The correlation between the values was tested, and an attempt was made to cluster individual components ($p = 0.05$). This was carried out using the k-means method.

Kruskal-Wallis's one-way ANOVA was used to determine the level of differentiation of the practical usefulness of individual geographical issues indicated by respondents. A significant Kruskal-Wallis test indicates that at least one sample (cluster) stochastically dominates one other sample (cluster). Due to the fact that this test does not identify where the stochastic

dominance occurs Dunn's test was used for analyzing the specific sample pairs.

RESULTS AND DISCUSSION

Most Useful Topics in Students' Opinions

At the beginning of the survey, students were asked to rate the usefulness (on a scale of 1-5, where 1 meant the lowest usefulness, 5–the highest) of various 25 issues (**Figure 1**) in terms of their practical application both in everyday life and in understanding the relationships occurring in the natural and socio-economic environment. The overall average values calculated using all obtained (592) ratings for individual issues ranged widely from 1.98 to 4.21 (**Figure 1**).

According to the average values obtained, all issues can be divided into 3 clearly emerging groups in terms of students' assessment of their usefulness:

- least useful, 7 issues, values 1.98-2.63,
- moderately useful, 8 issues, values 2.97-3.35, and
- most useful, 10 issues, values 3.67-4.21.

The results clearly show a significant gap between the assessment of issues from the two main branches of geography. Generally, issues related to physical geography (e.g., hydrology, geology, geomorphology, climatology) are perceived as the least useful in everyday life, while issues in the field of human geography are rated very highly. Among the group of "least useful" issues, only one–pilgrimage site–concerned human geography. The opposite was in the group of the 10 highest-rated issues–here only 1 touched on the issue of physical geography (or rather biogeography) because it concerned the value and functioning of forests. It should be noted, however, that this is a topic closely related to forest management (human geography).

The above trends are also very well illustrated by **Figure 2** showing the share of extreme answers regarding individual issues. More than half of the respondents considered topics mainly related to environmental issues to be completely useless or very useless (score 1 and score 2). The exception are the previously mentioned pilgrimage sites. Almost only socio-economic geography issues are described by more than half of the surveyed students as useful and the most useful (score 4 and score 5). Here again, the exception is the assessment of the value and functions of forests - nevertheless, it is an issue on the border of both geographical branches.

The average values for assessing the practical usefulness of twenty-five individual geographical issues were clustered into three groups for further analysis (k-means) (**Table 2**).

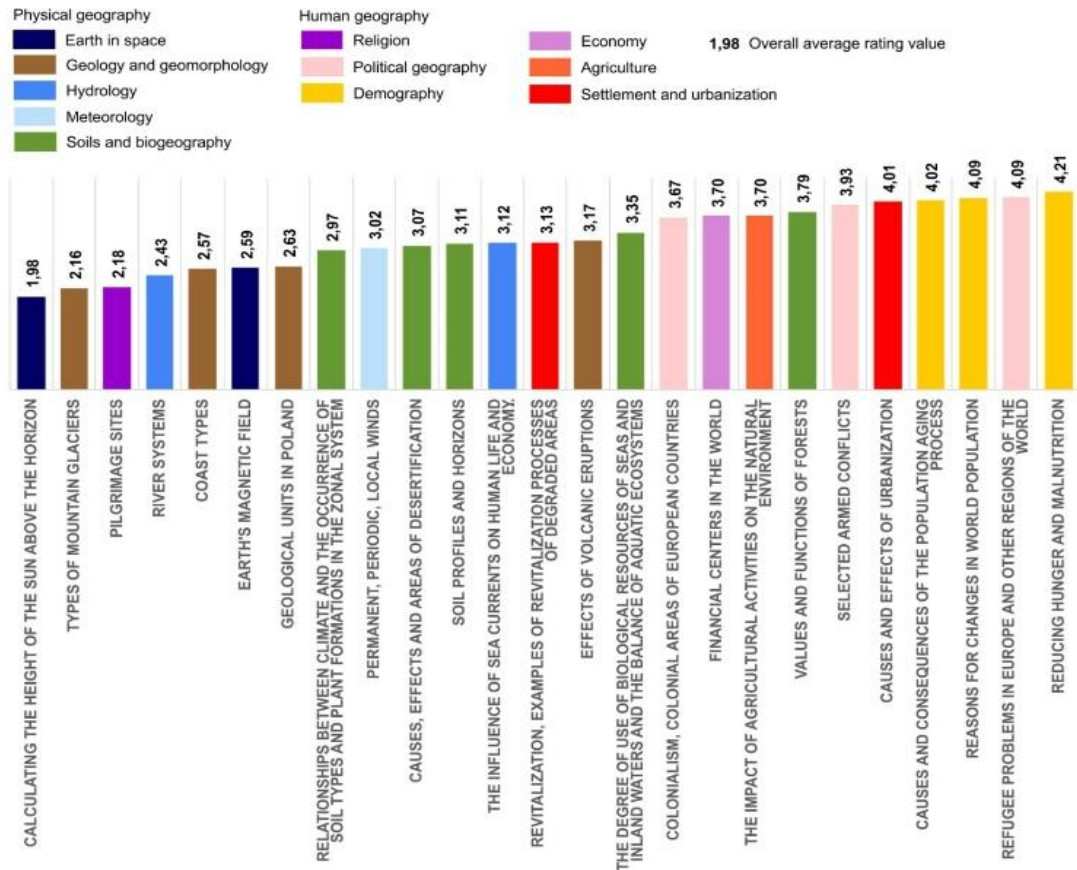


Figure 1. Overall average values for assessing the practical usefulness of individual geographical issues (Source: Authors' own elaboration)

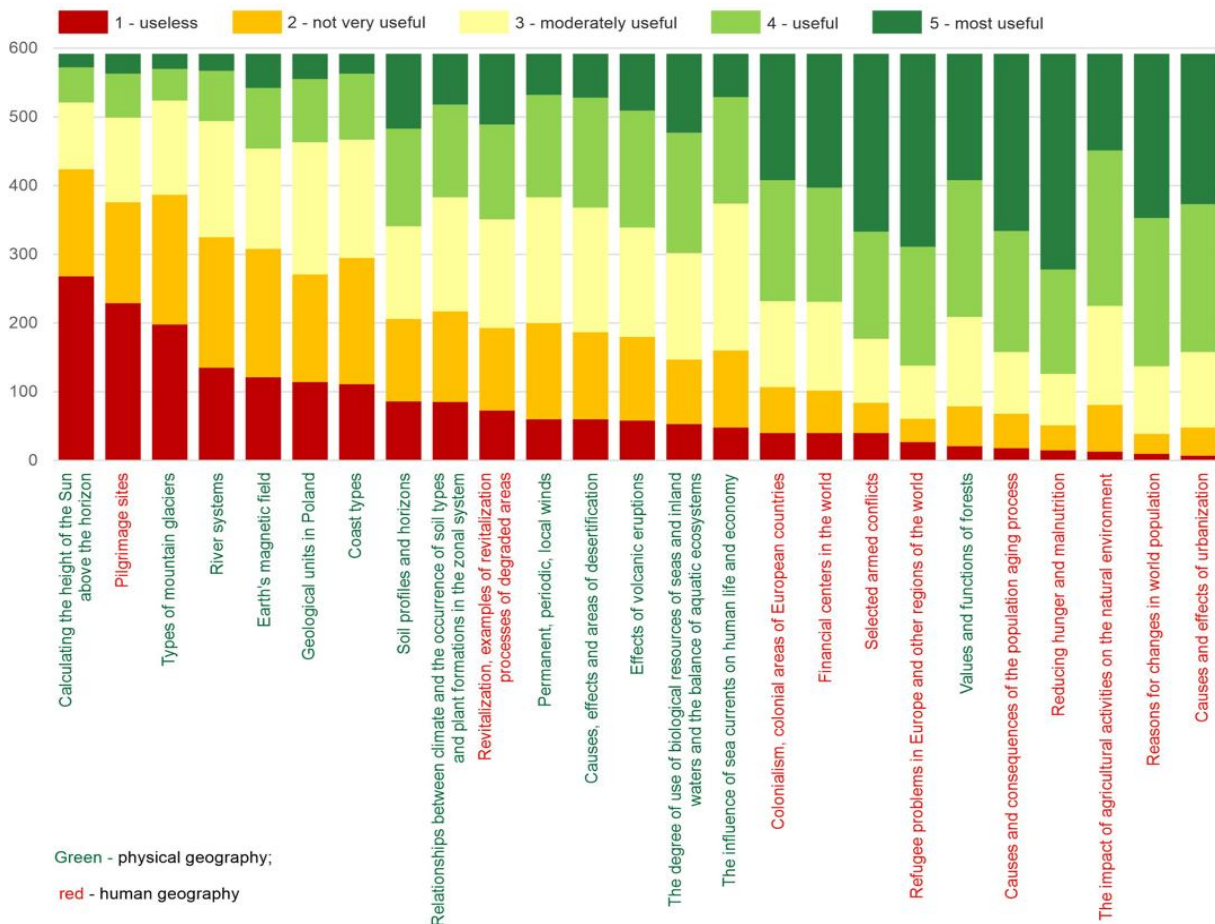


Figure 2. Assessment of individual issues on a five-point scale-Ranked from issues with the highest number of ratings: 1-not useful (Source: Authors' own elaboration)

Table 2. Individual geographical issues—Clusters of assessment according to the k-means method

| Individual geographical issues | Value | Cluster |
|---|-------|---------|
| Calculating the height of the sun above the horizon | 1.98 | 1 |
| Types of mountain glaciers | 2.16 | 1 |
| Pilgrimage sites | 2.18 | 1 |
| River systems | 2.43 | 1 |
| Coast types | 2.57 | 1 |
| Earth's magnetic field | 2.59 | 1 |
| Geological units in Poland | 2.63 | 1 |
| Relationships between climate and the occurrence of soil types and plant formations in the zonal system | 2.97 | 2 |
| Permanent, periodic and local winds | 3.02 | 2 |
| Causes, effects and areas of desertification | 3.07 | 2 |
| Soil horizons and soil profile | 3.11 | 2 |
| The influence of sea currents on human life and economy | 3.12 | 2 |
| Revitalization, examples of revitalization processes of degraded areas | 3.13 | 2 |
| Effects of volcanic eruptions | 3.17 | 2 |
| The degree of use of biological resources of seas and inland waters and the balance of aquatic ecosystems | 3.35 | 2 |
| Colonialism, colonial areas of European countries | 3.67 | 3 |
| The impact of agricultural activities on the natural environment | 3.70 | 3 |
| Financial centers of the world | 3.70 | 3 |
| The importance and functions of forests | 3.79 | 3 |
| Selected armed conflicts in contemporary world | 3.93 | 3 |
| Causes and effects of urbanization | 4.01 | 3 |
| Causes and consequences of the population aging process | 4.02 | 3 |
| The causes of changes in world population | 4.09 | 3 |
| Refugees in Europe and other regions of the world | 4.09 | 3 |
| Reducing hunger and malnutrition | 4.21 | 3 |

Table 3. Results of Kruskal-Wallis test for clusters of individual geographical issues (N = 25)

| Kruskal-Wallis test components | Scores |
|--------------------------------|----------|
| H (Chi ²) | 21.18 |
| H _c (Tie corrected) | 21.20 |
| p (Same) | 2.49E-05 |

Specifically, cluster 1 included topics that were rated as least useful; cluster 2 included topics that were rated moderately useful; and cluster 3 included the covered topics that were assessed as most useful.

The issues included in cluster 1 (average score of 2.36) are factual e.g., types of mountain glaciers or coast types and much of it is encyclopedic information. They are seen by students as the least practical. Cluster 3 contains the issues most useful according to respondents (average score of 3.92). Among them were those that concern both the natural environment (e.g., the importance and functions of forests) and human management (e.g., causes and effects of urbanization or refugees in Europe and other regions of the world). Issues included in cluster 2 (e.g., soil horizons and soil profile or The influence of sea currents on human life and economy) falling between the most and least useful according to students (Table 2).

As indicated by the result of Kruskal-Wallis test the differences between the clusters discussed above are statistically significant (Table 3).

Statistically significant differences were noted between all clusters (Table 4).

Table 4. Dunn's post-hoc test results for clusters of individual geographical issues (N = 25 & p = 0.05)

| | Cluster 1 | Cluster 2 | Cluster 3 |
|-----------|-----------|-----------|-----------|
| Cluster 1 | x | 0.04887 | 5.338E-06 |
| Cluster 2 | 0.04887 | x | 0.009909 |
| Cluster 3 | 5.338E-06 | 0.009909 | x |

Already at this stage of the analysis, it is clear that students do not see a connection between the knowledge provided in the teaching process regarding elements of the natural environment and everyday functioning. In fact, it is necessary for the proper management of environment both on a local, regional and global scale and necessary to forecast further changes and rationalize the use of natural resources, which translates into the quality of functioning of entire societies.

From further parts of the studies (answers from next survey questions), it seems that students are aware of this. So why do they rate the usefulness of physical geography knowledge so low? Perhaps this is due to an overly encyclopedic (types of glaciers, soils, lists of rivers etc.) approach during the teaching process. This kind of information is very easily available today from online resources and "digital natives" do not feel the need to learn it. If more emphasis had been placed on explaining the environment-space management-quality of life relationship, the ratings obtained from the first question of the survey about physical geography issues would have been higher.

There are interesting differences in the answers to question 1 in the context of particular groups of

Table 5. Sum of differences in ratings the usefulness of geographical issues according to the particular groups of respondents

| Group of respondents | Category of issues | | |
|--|--------------------|--------------------|-----------------|
| | All 25 | Physical geography | Human geography |
| Gender | | | |
| Male | -0.59 | -1.28 | 0.69 |
| Female | 0.03 | 0.35 | -0.32 |
| Not marked & non-binary person | 2.46 | 2.52 | -0.06 |
| Place of residence | | | |
| Village | -0.66 | -1.04 | 0.38 |
| Small city (up to 20,000 residents) | -1.32 | -0.45 | -0.87 |
| Medium-sized city (20,000 to 100,000 residents) | -2.11 | -2.23 | 0.12 |
| Large city (over 100,000 residents) | 2.08 | 2.61 | -0.53 |
| Scope of geography teaching | | | |
| Basic | -1.21 | -1.15 | -0.06 |
| Extended | 1.83 | 0.93 | 0.90 |
| Intention to pass geography in the high school graduation exam (matura) | | | |
| Yes | -0.36 | -0.43 | 0.07 |
| No | -0.88 | -0.21 | -0.67 |
| Not sure | 1.04 | 0.77 | 0.27 |

respondents (divided into gender, place of residence, level of geography teaching and intention to pass graduation exam). In order to be able to compare the level of assessment of the usefulness of subsequent issues by particular groups of respondents, the average values obtained from their answers (within particular groups) for individual 25 issues were compared with the overall averages presented in [Figure 1](#). The results obtained for individual groups of respondents were added:

- for all 25 issues in order to show the general attitude (whether it is higher or lower than all surveyed students) of the individual group of respondents to the usefulness of geographical content in general,
- for 14 issues within the physical geography branch to show whether a given group of respondents evaluates physical-geographical issues higher/lower than all students surveyed, and
- for 11 issues within the human geography branch to show whether a given group of respondents evaluates social-political-economic issues higher/lower than all students surveyed.

Negative values mean a lower assessment of usefulness according to a given group of respondents compared to all respondents, positive values - a higher assessment ([Table 5](#)). The greatest diversity of assessment level was found in groups divided by gender. Girl's ratings on all issues were similar to the whole respondents' opinions, while they rated physical and geographical issues slightly higher and those related to human geography as less useful.

A completely opposite situation applies to boys - they assess the issues of physical geography as definitely less useful, while the group of human geography issues as definitely more practical (compared to all respondents). Such differences between boys and girls may be

culturally conditioned - through the imprinting of daily adult behavior, formal education, and social orientation (Czajkowska, 2018; Pufal-Struzik, 2017). However, it is difficult to separate this from the natural predispositions of both sexes (Herman-Jeglińska, 1999). It is known that boys show a naturally higher level of aggression (Wojciszke, 2012) and this may be why they are more interested in wars and in questions about armed conflicts ([Figure 3](#)).

Of course, it is not without significance that they are assigned a culturally social role as "defenders" of the family/country, which also influences the obtained result. The situation is similar in the case of financial centers ([Figure 3](#))-boys are traditionally taught from childhood the need to provide the family's financial security. In turn, non-binary and unidentified students rated geographical issues as much more helpful - compared to gender-defined groups. This result is mainly related to the positive perception of the role of physical-geographical issues in everyday life. The greater interest of non-binary (and undecided) people in environmental issues may result from their generally greater sensitivity resulting from the pressure they are subjected to in their everyday lives by society (Johansson et al., 2022). Unfortunately, it is not yet possible to compare the above results with research by other authors - as recently pointed out by Prasad and Hassan (2022) there is a lack of research on the differences in the perception of geographical issues by gender. One of the few studies on this topic was conducted in Ghana (Opoku, 2020). The results of this research confirm that women are more interested in natural phenomena, while men are more focused in technical topics, e.g., maps or urbanization. This is also supported by studies conducted among Taiwanese society (Tien & Huang, 2023), which showed that women are generally more sensitive to environmental issues than men. On the other hand, research conducted on students from six Czech

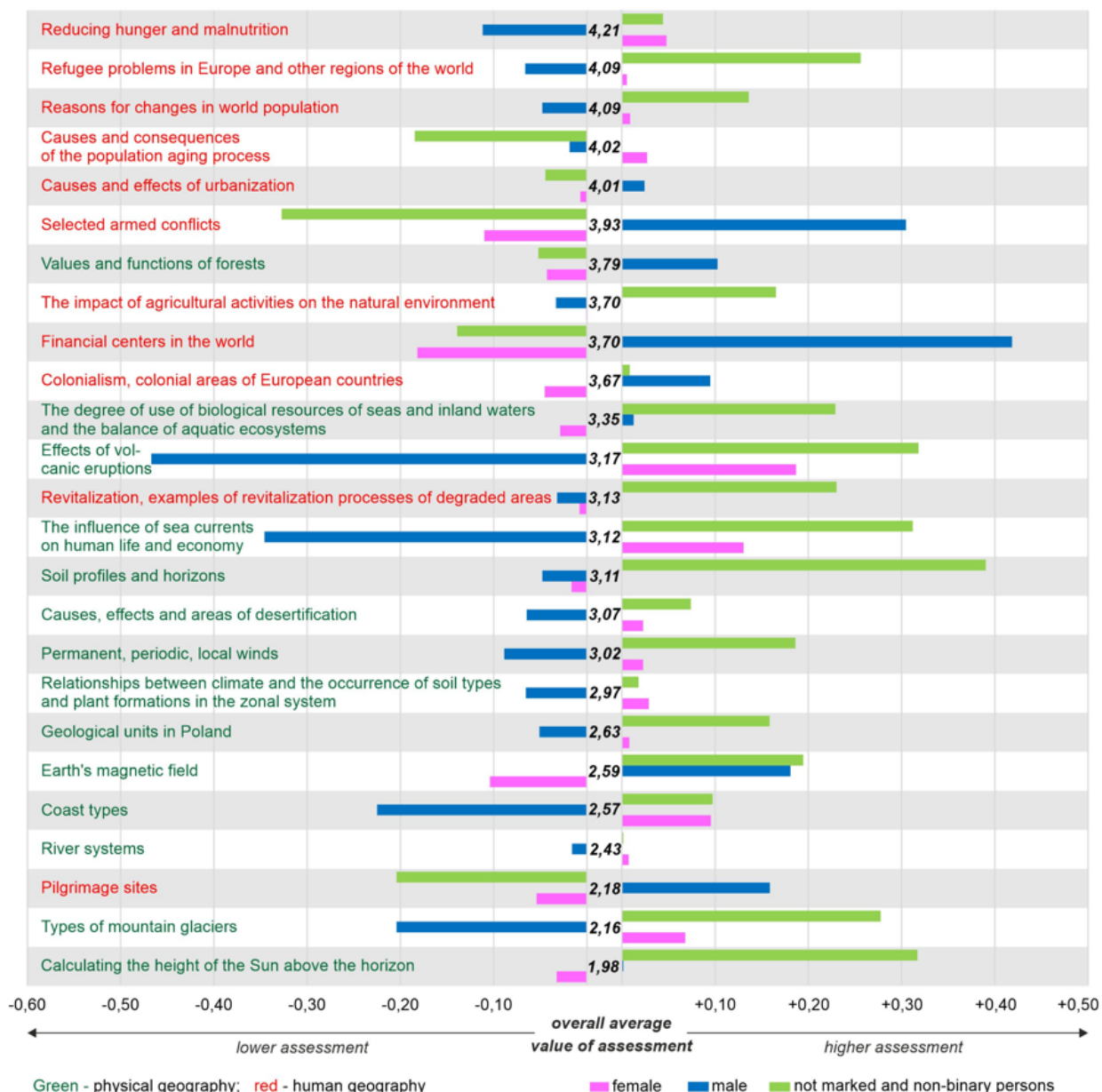


Figure 3. Differences in the assessment of the usefulness of individual issues by gender compared to overall average values (Source: Authors' own elaboration)

lower secondary schools found no significant differences in the perception of the importance of geographical content between boys and girls (Kubiak et al., 2012).

Comparing the other categories of respondents, it can be said that geographical content is perceived as more useful in everyday life by people from large cities (Table 2). Their rating was higher than the general average, mainly in terms of physical and geographical issues. Perhaps living in big cities makes young people more sensitive to environmental issues because they lack contact with nature in everyday life. Residents of small and medium-sized towns pay the least attention to geographical issues. This is clearly visible in Figure 4.

Issues related to physical geography, such as “types of mountain glaciers,” “permanent, periodic, and local winds,” and “the influence of sea currents on human life

and the economy,” are rated significantly higher by respondents from cities with populations exceeding 100,000, compared to other respondent groups. Conversely, residents of the largest cities gave below-average ratings only for political and economic issues, such as colonialism, armed conflicts, and the world’s financial centers. The results obtained are confirmed by the nationwide “green report” from 2020 (Izba Gospodarki Elektronicznej, 2020). The scope of teaching geographical content is also important. Respondents from the extended geography group assess geographical content as more important compared to students from the basic group (Table 2).



Figure 4. Differences in the assessment of the usefulness of individual issues by settlement population size compared to overall average values (Source: Authors' own elaboration)

Practical Use of Geographical Issues–Most Frequent Examples

As a second part of the survey students were asked to indicate the issues (a minimum of 3, up to 5) discussed in geography lessons that seem important to them in everyday life outside of school, and then to give an example of their practical use. 89.4% of respondents was able to fulfill this task completely; 2.4% gave 2 examples, 1.7% one example of useful topics and 6.6% was unable or unwilling to provide even a single example (Figure 5).

The largest group of respondents indicated various human geography topics (together 65%) as the most interesting and practical. One third (32.2%) listed physical geography topics and just 2.8% indicated topics

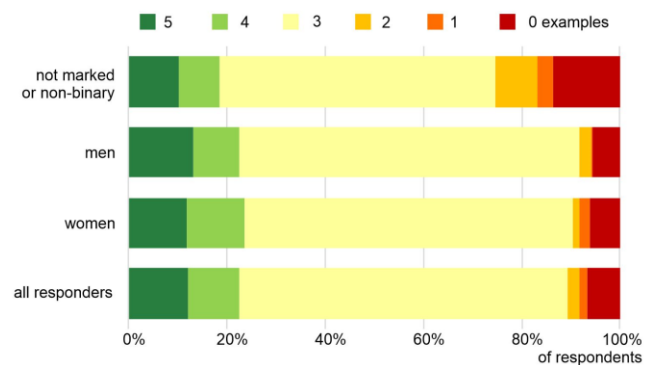


Figure 5. Number of geographical issues and examples of their practical use in life outside of school given by students (Source: Authors' own elaboration)

related directly to cartography and maps. In studies conducted in Oman and Turkey (Al-Nofli, 2010; Senyurt, 2014), topics in the field of physical geography were more often indicated. Korvasová (2022) reviewed several papers related to attractiveness of geography and observed that geographical topics related to physical geography resonated the most with students. Al-Nofli (2010), however, indicates an increase in interest in human geography among older students which corresponds to the presented research conducted among students in the last two years of high school, i.e., 17-18 years old.

The examples given by the students were divided into several main topics (Figure 6). If a student gave

several examples from the same category (topic)—it was counted as 1 so that the data below would show the % share of students interested in a given topic.

Among the largest number of examples of everyday use were topics related to understanding the geopolitical situation (35% of students), as well as issues related to finance and economics (24.2%), enabling preparation for a further professional career (Figure 5). In both cases it was definitely more important for boys than for girls. Other human geography topics mentioned significantly more often by boys, compared to girls and non-binary and unspecified persons, included armed conflicts and immigration. This is consistent with the results of the first survey question and highlights the diversity of

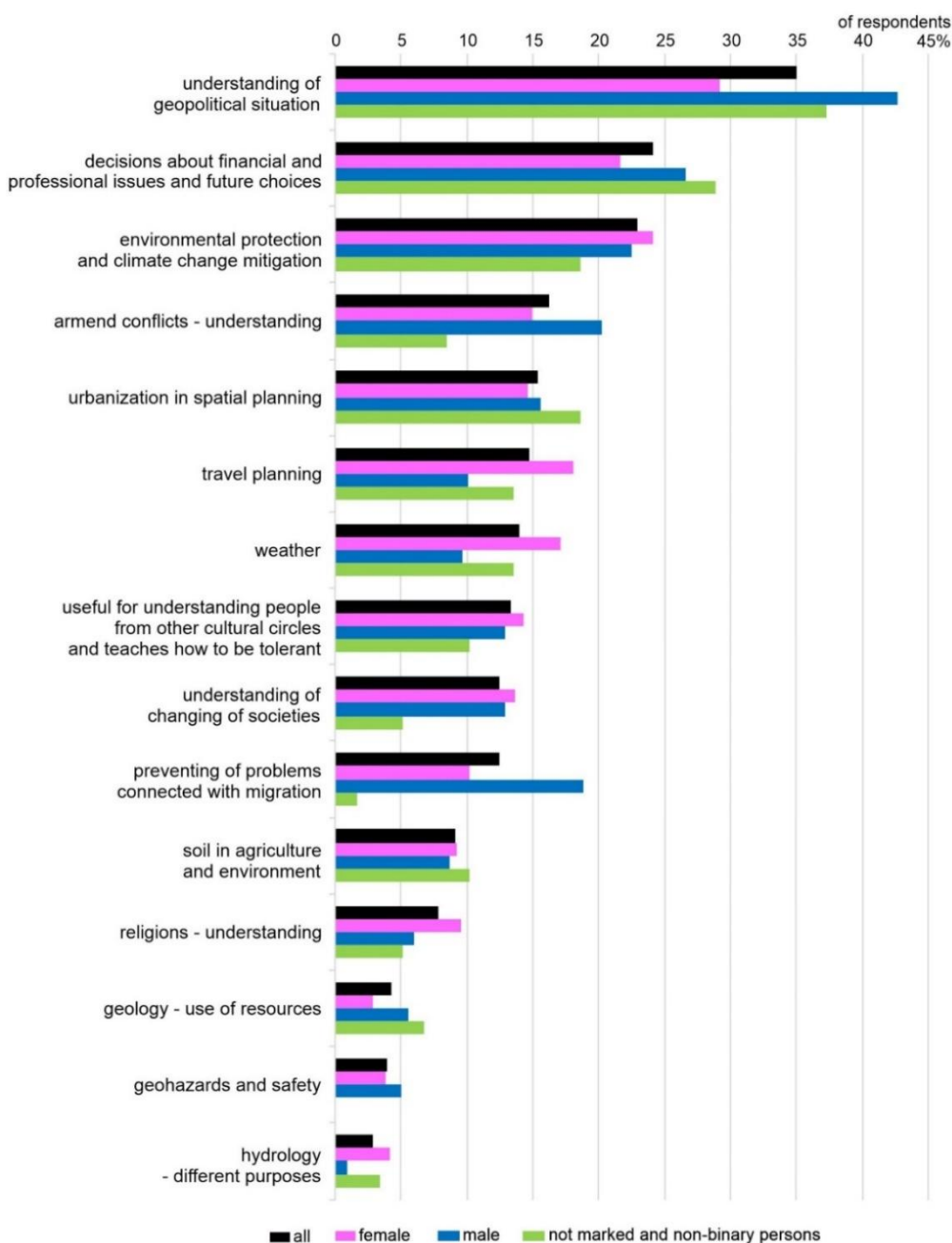


Figure 6. Frequency of explanations of how the geographical issues could be used in everyday life (Source: Authors' own elaboration)

interests between the genders. The overall importance of these topics is certainly also related to the increasing coverage of the discussed threads in the media, which is related to the increasingly tense geopolitical situation in Europe in recent years. Compared to other human geography subjects, religious topics were relatively rarely mentioned (7.8%) but this subject overlaps with issues concerning other cultures and tolerance towards them. Here, girls were more likely to give examples.

Many students (almost 15%) also gave examples of practical use of geographical knowledge in planning a travels. These exemplifications drew from both knowledge of physical geography (e.g., weather, knowledge of the environment) and human geography (knowledge of other societies). Here, girls had significantly more ideas than the other genders.

Answers along with explanations of how the knowledge and skills acquired during physical geography lessons could be used in everyday life can be aggregated into several issues related to this branch of geography, among them three sets are the largest (**Figure 6**). These are:

- environmental protection and climate change mitigation (indicated by 23% of respondents),
- weather prediction (indicated by 14% of students), and
- knowledge about soil cover (9.1%).

Interesting fact is, that topics related to geology, environmental disasters and geohazards and hydrology were mentioned as useful only by 4.2%, 3.9%, and 2.9% respondents, respectively. Of course, some of this content was already included in the general environmental protections threats, but as separate issues they appeared extremely rarely. According to other authors, in some countries issues regarding geohazard were indicated much more often as topics related to daily life and helpful to know how to react and protect themselves during earthquake. This is case of Turkey, which is located in seismic area (Tomal, 2010). Students from Australia also showed interest in natural hazards, scoring 3.02 on a 5-point Likert scale (Kidman, 2018). It can be explained by Poland's location in part of Europe not prone to earthquakes and without volcanic activities. However, it should be noted, that in our research we didn't asked what is interesting for students but what is useful, so direct comparison of results is not possible.

Some answers prove deep understanding of young respondent of interdependencies geography lessons are presenting, e.g.,

- 'demography affects many spheres of our lives: the labor market, housing availability, state budget revenues and expenses, etc. The demographic situation affects every citizen of the country and everyone should have a basic understanding of the functioning of these mechanisms. More specifically- by understanding this issue, we can conduct policy in

this area more effectively, for example by encouraging older people to work longer' and - 'knowledge about social problems is very important to know what is happening in the world, what problems need to be solved so that we all could live better and to reduce inequalities. This will also be useful in elections and various political decisions, in order to understand political programs'.

Not Useful Topics in Students' Opinions

As a third part of the survey students were asked to indicate the 3 to 5 topics addressed during geography lessons that seem unnecessary or meaningless and impractical.

Only 7 students, so just above one in a hundred (1.2%) did not indicate any topics as unnecessary but wrote that 'all of them are useful and important'. It shall be noted that majority of respondents, that gave such answer were female (5 out of 7). One of students explained:

"All topics are interconnected and allow you to understand the world around you, so you cannot point out any that are unnecessary".

The majority of respondents indicated various physical geography topics as being not useful in everyday life in their opinions (**Figure 7**). Only 2.7% of students didn't pointed out any topics related to physical geography but gave all 3 representing human geography. Indications for various branches of physical geography varied from 21.5% for climatology/meteorology topics to geomorphology (38.7%) and geology indicated by highest number of students (45.9%). This is contrasting with the significantly lower-nearly four times-percentages of indications for various topics from disciplines of human geography (**Figure 8**). Students pointed out most often topics associated with industry, trade, and service geography (12%) and geography of agriculture (10.8%), while tourism geography was deemed least often as not useful (2.7%).

There appears to be a general trend where a higher percentage of respondents find physical geography topics less useful compared to human geography ones. It can be assumed that the reason for such a situation is greater complexity of physical geography and more references to mathematical calculations, as well as data-heavy topics in especially in such disciplines as geology and geomorphology.

It seems that generally students disfavor all topics which are connected with taxonomy, systematics or classification of objects. It is clearly visible by the number of indications in the section of survey, where respondents listed most impractical and unnecessary topics (open-ended question). Students listed classification of soils (87 indications-14.7%), minerals

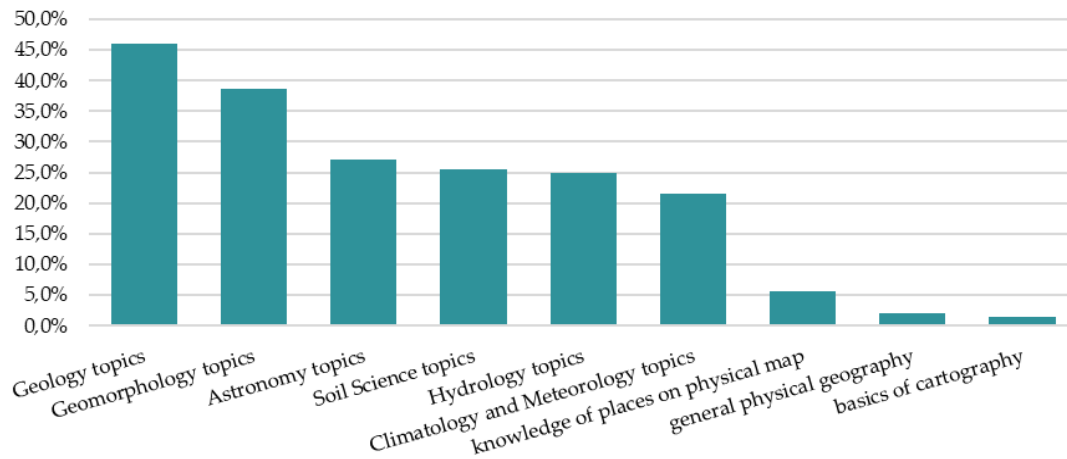


Figure 7. Number of respondents who listed topics related to branches of physical geography as not useful (n = 592) (Source: Authors' own elaboration)

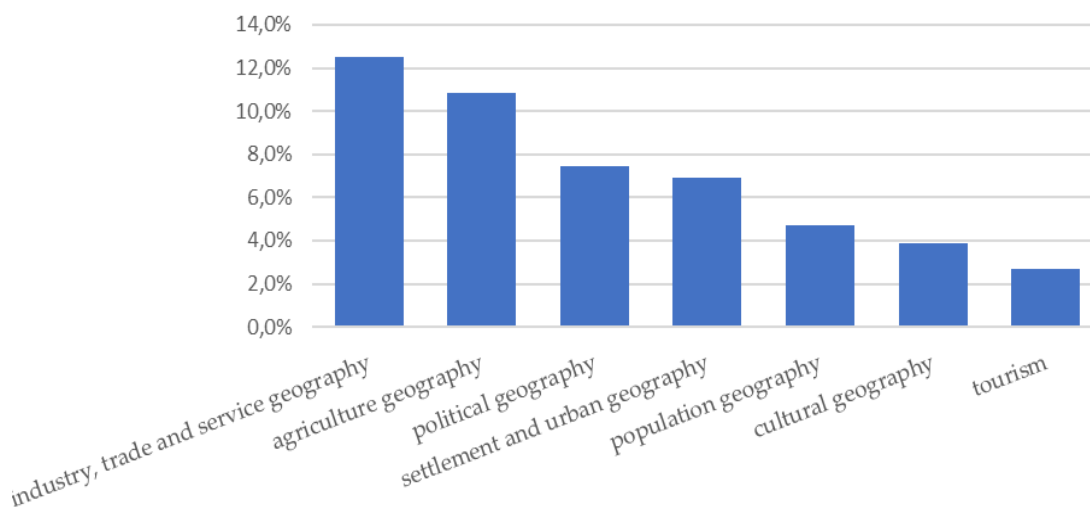


Figure 8. Number of respondents who listed topics related to branches of human geography as not useful (n = 592) (Source: Authors' own elaboration)

and rocks systematics (102 indications–17.2%), types of clouds (67 indications–11.3%), river systems and lake types (82 indications–13.9%).

On the base of survey analysis it can be stated that,

- students do not like topics with mathematical calculations,
- students do not like topics which are connected with taxonomy, systematics or classification of objects, and
- students do not like topics connected with large numbers of names to memorize.

It is fully understandable why many students dislike topics related to recognizing and classification of earth spheres elements. For example, many soils are similar and there is no clear boundaries between soil units. Soil is continuum, that can't be easily delimited. Also minerals and rocks can be pretty similar to each other and if teachers expect students to recognize them it could make acquiring and assessing such knowledge stressful and thus disliked.

Mastering the ability to recognize given objects requires a significant amount of time and practical exercises. There is not enough time for this at school, so teachers should decide very carefully about the requirements for students so as not to discourage them.

Similar issues can be observed also on higher educational levels, e.g., in soil classification teaching (Langhor, 2002).

CONCLUSIONS AND FINAL REMARKS

Results obtained suggests that respondents perceive human geography topics as more practically applicable or relevant compared to the more scientific and technical aspects of physical geography. This perception may stem from the fact that human geography directly addresses social, economic, and cultural phenomena that are often encountered in everyday life. Understanding the geography of industry, trade, and services can provide valuable insights into economic trends and regional development which are tangible and

immediately relevant to student's personal and professional lives, especially approaching for them in short notice crucial decisions related to the choice of field of study and thus future professional career. The results suggest that many students see such connections, as 11.8% of them indicated various human geography topics and explained that they seem useful for them because can help in current and future choices and decisions related to financial and professional issues. Conversely, physical geography, with its focus on natural aspects of the environment may be seen as more abstract or less directly related to everyday experiences. The technical nature of these subjects, which often require specialized knowledge and terminology not used in everyday conversations and social media, might make them appear less accessible or less immediately useful to those without a specific interest or need in these areas. This divergence in perceived usefulness highlights a potential gap in the way these subjects are communicated and taught, suggesting a need for more integrated approaches that connect physical geography with real-world applications to enhance its perceived relevance and utility.

Research on image of geography and attitudes of students toward this subject were conducted in many countries (Korvasová, 2021), although in such studies geography is not split into two parts and thus it can't be said what influence it more-human or physical topics (Aydin & Tülümen, 2019; Karolčík et al., 2019; Kubiátko et al., 2012; Sack & Petersen, 1998; Usher, 2023).

Majority of students disfavoring topics in physical geography is very concerning issue, so efforts should be made to reverse this trend, as geography, combining social content with environmental issues, holds a unique position for diagnosing threats resulting from various aspects of human activity on the natural environment. By explaining the impact of humans on the surrounding world and indicating solutions to mitigate these threats, geography plays a crucial role in ecological and social education. Also social context given to environmental studies integrating two branches of geography can lead to holistic solutions to eco-social problems (King, 2017). It is also very popular subject taken by many students at high school graduation exam (*matura*). In 2024 it was selected by 22.7% students in Poland (55,854) being the most popular, followed by biology, which, however, is selected by significantly fewer students (16.48%) (Smolik, 2024). Since geography is the most popular subject in the high school graduation exams, studies examining the usefulness of different geographical content are important. Understanding which topics students find valuable can help tailor the curriculum to better meet their needs and interests. This focus not only enhances student engagement but also ensures that the knowledge they acquire is practical and relevant, preparing them for real-world challenges.

Students indicated the plethora of various topics as unnecessary. Sometimes the same topics were indicated as both useful and pointless. The reasons likely lie in the personality and teaching style of individual teachers. It may also be due to a mismatch in the way "digital immigrants" transfer knowledge to "digital natives". Therefore, attention should be paid to the proper preparation of geography teachers to work with a modern, demanding audience in order to interest students in the content.

Students' opinions as valuable feedback should be critically considered by the authors of geography curriculum. Of course, not to eliminate such "unuseful" topics from the core curriculum, as undoubtedly majority of them are relevant and must have a place in the curriculum, but as an indication of what topics should be modernized and what content could be reformulated in order to move away from descriptive and fact based teaching that is unattractive to "digital natives" generation of students towards problem-based teaching to foster critical thinking. Curriculum designers and teachers should recognize that excessive focus on minor details can diminish the enjoyment of learning geography (Prasad & Hassan, 2024). Students' opinions offer a valuable perspective that should be considered to improve and implement changes in education that effectively address educational needs of young people (Bragg, 2001; Korvasová, 2022).

In the approaching geography curriculum reform in Poland following issues shall be considered:

- **Diverse student needs:** Students have different interests and learning styles, which affect what they find useful or unnecessary. Some topics may be extremely interesting and important to some, while being less significant to others and decisions about elimination of certain content should be very well thought out so not to 'throw the baby out with the bath water'.
- **The role of the teacher:** The manner in which a teacher presents material greatly influences how it is received by students. Engaging and interesting teaching strategies and methods can change the perception of even the most complex and abstract topics. There should be developed for conveying educational content, available to teachers, offered in regular courses or workshops at university geography teaching centers.
- **The importance of curriculum modernization:** Student feedback can be a valuable guide for curriculum developers. It is a recommendation to look for a cause why certain topics are negatively perceived and how they can be transformed to better meet contemporary educational needs and promote critical thinking.
- **Problem-based learning:** Shifting from purely factual teaching to a problem-based approach can

help students understand why certain issues are important and how they can be applied in practice. This approach also fosters the development of critical thinking skills, which are crucial in today's world.

Modernizing education is a complex process that requires the cooperation of various stakeholders, including politicians, educational experts, teachers, parents and students. A well-designed curriculum that considers the diversity of students and promotes active, engaging forms of learning can bring significant benefits in terms of developing their skills and interests. The changes taking place in education are stimulating a review of existing educational solutions. Thus, elements that have a positive impact on educational efficiency should be retained, and those that are least effective should be eliminated. The activation of both the student and the teacher will raise not only their involvement in the educational process but also contribute to the level of public knowledge of the role that geography plays in the surrounding world.

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