European Journal of Geography

Volume 13, Issue 1, pp. 022 – 046

Article Info
Accepted: 17/02/2022
Corresponding Author: (*) vjanos@gamma.ttk.pte.hu
DOI: https://doi.org/10.48088/ejg.j.var.13.1.22.46

Research Article

The Presence of Sustainability in Hungarian Geography Textbooks

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Keywords

Education for sustainable development,
sustainable development goals,
sustainability competencies
Hungarian Geography Textbooks,
content analysis

Abstract

The Lucerne Declaration on Geographical Education for Sustainable Development recommends including the subjects of Education for Sustainable Development and sustainability in Geography teaching all over the world. One possible way to examine the practical implementation of education for sustainability is through textbook analysis. The present study investigates how Hungarian textbooks published after 2015 perform in terms of ESD. In order to do that, it conducts content analysis the help of the MAXQDA 2020 programme, looking for the presence of Sustainable Development Goals and competencies related to sustainability in the analysed educational media. The results show that Geography in Hungary has an ecological approach to teaching about sustainable development. Sustainability issues relevant to society are less emphasized. Textbooks written in a modern, problem-centric spirit pay a lot of attention to competence development. However, ESD only appears in the studied textbooks sporadically; there is no evident competence development concept present in them in a planned, structured format.

Highlights:

Computer-assisted content analysis of Hungarian geography textbooks to examine ESD

ESD not deeply integrated into the curriculum and textbooks.

There is little deeper understanding and competence development

Reducing the number of lessons is a threat to ESD

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1. INTRODUCTION

Education for Sustainable Development (ESD) is both a goal and an opportunity to achieve the United Nations Sustainable Development Goals (SDGs). To support this, UN has launched the Decade of Education for Sustainable Development (2005-2014) (UNESCO, 2005) and its continuation, the Global Action Program (GAP) (UNESCO, 2016).

Geography as a science and a school subject can be a key medium of promoting ESD (Haubrich et al, 2007; Bardsley, 2004; Fien, 2005; Pawsons, 2015; Meadows, 2020). Geography serves as a bridge between natural, social sciences and economics, and it studies the principles created by them in space, in the perspective of changing time (Pirisi & Trócsányi, 2019; Farsang, 2011). The subject can create a mindset that is rarely present in other scientific areas (Palacios et al., 2017). Geography facilitates the development of global thinking essential for ESD (McKeown & Hopkins, 2007). Furthermore, geography helps teachers and pupils to learn about interconnectedness and complexity of sustainability challenges (Fögele, 2016), also it aids students think about alternative futures beyond their own experiences (Maude, 2017).

The aim of the present study is to examine the Sustainable Development (SD) contents of current Hungarian geography textbooks. To do this, it performs computer-assisted textbook analysis that simultaneously monitors the appearance of SDGs and sustainability competencies in textbooks. The study also examines the level of knowledge required by students for SD-related tasks and problems in textbooks using a modified version of the Bloom taxonomy. Similar research has rarely been carried out internationally, while no such analysis has been carried out in Hungary so far.

2. RESEARCH BACKGROUND

2.1 Sustainable Development

With technological development, humanity brought about the geological epoch called Anthropocene (Crutzen, 2002). The excessive economic growth of humanity revealed an entire network of issues that are present locally, but have a global impact (Tóth, 1991; Rakonczai, 2003; Hajnal, 2006). Global problems of the 21st century, such as climate change or the overpopulation of the Earth, make our societies face problems the aggregated impact of which truly seem to be issues without a solution.

In response to environmental problems, the green movement gained ground in the second half of the 20th century, raising the question of whether there are limits to economic growth (Meadows et al., 1972). Reexamining the direction of economic development has led to the emergence of the concept of SD. The World Commission on Environment and Development (named after the then Norwegian Prime Minister, Gro Harlem Brundtland: Brundtland Commission) published a report entitled “Our Common Future” (1987). The committee sets a trajectory for humanity to meet the needs of the present without compromising the ability of future generations to meet their own needs. SD has been defined by the committee as a three-pillar system, with environmental, economic and social policies as the three spheres. The three pillars are interrelated, so they need to appear together in action for sustainability, emphasizing intergenerational solidarity. Daly (2007) pointed out that sustainable development can only be achieved if certain cardinal values are adhered to. We do not have a planet with infinite resources, we are confined. Daly’s findings are complemented by Opschoor (2000), who adds the time and space factor to the issue of sustainable development. In his view, the temporality of human activity should coincide with the temporality of the Earth, for example in terms of the use and reproduction of resources.

The United Nations continued to work after 1987 to achieve SD and international cooperation. In 1992, 178 countries participated in the United Nations Conference on Environment and Development (UNCED, 1992) in Rio de Janeiro. The aim of the initiative was to protect the society and the environment. It was then that Agenda 21 (United Nations

Conference on Environment and Development, 1992) was issued, setting out a plan for international, national and local action for SD. In 2000, UN member states adopted the Millennium Declaration, which led to the completion of the Millennium Development Goals (MDGs) (United Nations, 2015). The main goal of the MDGs was to drastically reduce poverty. In 2012, the report "Future We Want" (United Nations, 2012) was released at the United Nations Conference on Sustainable Development, which led to the creation of SDGs. The 2030 Agenda for Sustainable Development, which designates 17 SDGs for humanity, was presented at the 2015 UN Sustainable Development Summit (United Nations, 2015). The 17 SDGs address the major environmental, social and economic challenges in order to steer development in a sustainable direction.

2.2 Education for Sustainable Development and the competencies of sustainability

Education, as stated in Agenda 21 (United Nations Conference on Environment and Development, 1992), has a major role in achieving SD. Using the UNESCO definition, the ESD is the process of learning how to make decisions that take into account the long-term future of the economy, ecology and equity of all communities (UK National Commission for UNESCO, 2013). ESD aims to educate active citizens with systematic and critical thinking who are ready to act, and who are able to understand the long-term impact of their own and humanity's actions (Wiek et al., 2011). In order to achieve that, ESD integrates the issues of SD to teaching and learning, with great emphasis on the application of activity-oriented educational methodology (Ali, 2017).

ESD is interested in providing adequate quality academic knowledge (Mogensen & Scnack, 2010) and to provide competencies in the conditions for SD (United Nations Economic Commission for Europe, 2011). The definition of competencies may differ from author to author, so we use the definition of Spady (1994). Competence is a functionally linked complex of knowledge, skills, and attitudes that enable successful task performance and problem-solving. Sustainability competencies are systems of knowledge, skills, and attitudes that enable successful task performance and problem-solving in the context of real-world issues regarding sustainability.

As de Haan (2010) argues, creating a system of sustainability competencies is not an easy task. Several studies have recently been conducted on what are ideal sustainability competencies (Barth, 2009; Bryne, 2000; de Haan 2010; Cebrián & Pubill, 2014; Stibbe, 2009; Hidalgo & Arjona-Fuentes, 2013; Mogensen & Schnack, 2010; Rieckmann, 2012; de Haan & Rooda, 2010; Lambrechts et al., 2013), but in many cases, these studies, using the words of Wiek (et al., 2011), are "laundry lists" that are not comprehensive and systematic interpretations. In contrast, Wiek (et al., 2011) presents a network of competencies that systematically build on each other based on literature reviews. The competencies presented in the article (systems-thinking, futures-thinking, values-thinking, strategic-thinking, and interpersonal competencies) have not yet played a major role in textbook analysis, but the authors conclude that they may play a major role in evaluation of educational goals.

The development of competencies does not depend solely on the quality of textbooks. The complex knowledge system is based on extensive school practice and the motivation of students. In contrast, textbook analysis remains of great importance as crucial sources of information for teachers and students (Wynes & Nicholas, 2017) and as tools that help implementing curriculum content (Molin, 2006).

2.3 ESD and geography education

There are several directions to take in investigating whether Geography is able to play its role in teaching aspects of ESD. We can look at Curricular objectives (Bagoly-Simó, 2014; Dube, 2017; Colliver, 2017; Varjas, 2021), the role of educational institutions in

communication (Morgan, 2011; Sprenger & Nienaber, 2018), and we can conduct research involving teachers (Shaari & Osman, 2011; Nguyen, 2018; Harskamp & Knippels, 2021). Another direction could be to analyze the application of modern teaching methods, and we can make methodological recommendations too (Maude, 2014; Vejmelka, et al., 2018; Palmberg et al., 2019; Yli-Panula, et al., 2019; Seres, 2019; Meadows, 2020; Hawa et al., 2021).

From the aspect of research, it is useful to analyze Geography textbooks, which are still an important part of school education (Jongwon & Catling, 2015). Textbooks create the link between the planned and the applied Curriculum, their task is to implement the goals and objectives set by the Curriculum, to realize them potentially in practice in the schools (Valverde et al., 2002). They communicate relevant information and knowledge (Kojanitz, 2007; Esteves, 2019), social concepts (Vindevoghel, 2016), and they have a latent role to transfer information in connection with sustainability (Scott & Lawson, 2002)—as Bagoly-Simó (2014) puts it, they work as "secret Curricula", controlling the content of education.

Boehn and Hamann (2011) studied Geography textbooks from several German states. They concluded that although German Curricula put great emphasis on sustainable development, the subject is rarely discussed in the textbooks explicitly. Despite the low number of mentions, Sustainable Development is present in the form of practical knowledge and in connection with thinking about the future. Most frequently the environmental and economic aspects of Sustainable Development are mentioned. Other research (Biström & Lundström, 2021; Arrebola & Martinez-Medina, 2018; Nguyen, 2019) had similar results regarding dimensions of sustainability. Other research of the topic has shown that the tasks and questions in textbooks do not seek methodological diversity (Nguyen, 2019; Arrebola & Martinez-Medina, 2018) to develop competence, do not attempt to elicit students 'everyday knowledge (Kowasch, 2017), and do not expect them to think reflectively. In their study, Tracana and colleagues (2008) argue that textbooks place less emphasis on the role of human activity and do not place enough emphasis on individual responsibility.

Further research studied the presence of subjects relevant to sustainability in Geography. The studies for example looked at teaching about global climate change in schools (Dalelo, 2011; Colliver, 2017; Bozkurt, 2019; Meechan, 2018), and the issue of using raw materials (Hussein, 2018).

2.4 The Case of ESD in Hungary

In Hungary, ESD is a key goal of education. At the international level, this is based on documents created by UNESCO (World Commission on Environment and Development, 1987; United Nations Conference on Environment and Development, 1992; UN General Assembly General Assembly, 2015). The tasks of the subject of geography at the international level in connection with SD are set out in The Lucerne Declaration on Geographical Education for Sustainable Development (Haubrich et al, 2007).

National level sustainable development goals in Hungary are provided by the National Framework Strategy on Sustainable Development (National Council for Sustainable Development, 2013). The document explains the concept of SD as follows: "*the conditions that ensure the individual's good life and the common good are not experienced by the generation that creates its own well-being at the given moment, it does not exhaust its resources, but it also preserves and expands them for the next generations in the right quantity and quality*" (National Council for Sustainable Development, 2013, 32). The main regulatory document of the education system in Hungary is the National Core Curriculum (NCC). Currently, two documents, the 2012 NCC (Ministry of Human Resources, 2012) and the 2020 NCC (Ministry of Human Resources, 2020) are in force. The NCC 2020 will take the place of the previously developed curriculum in ascending system. The 2012 document attach big emphasis on SD (Varjas, 2021). Citing the 2012 curriculum: "*The goal is to make environmentally friendly, value-based, and sustainable behavior based on knowledge and*

love of nature and the environment a priority for students" (Ministry of Human Resources, 2012, 10643). Under both core curricula, subject-specific framework curricula were developed, which elaborate the output conditions in detail.

In 2015, the Hungarian Qualifications Framework Proposal (*Magyar Képzési Keretrendszer*) was adopted, which regulates the various levels of education. Environmental responsibility has emerged as an expectation at all levels up to the graduation exam (*Érettségi* – the final exam of high school education in Hungary) (Mónus, 2020). Furthermore, in Hungary, teachers move on a qualification system throughout their careers. One element of this rating system is that they must prove how qualified they are in the field of ESD (Educational Authority, 2013).

The 2020 NCC no longer considers ESD a priority development goal, it is not necessary to address it in all subjects. The task of teaching ESD, like as we see the international examples, in many cases falls on the subjects of science subjects. On the other hand, technological and economical advances and their effects are presented in Hungarian humanities, such as history, as a triumphant process, with little focus on the disadvantages of development (Mónus, 2020). In connection with Hungarian ESD learning, Bokor (2015) also explains that the school system presents global problems too isolated and too distant. It shows the problems to the students, but in the sense that human civilization is not affected by these difficulties. Furthermore, development is presented as our economic development allows that to meet the growing needs of societies, even with an ever-growing population.

2.5 State of geography education and ESD in geography in Hungary

A free textbook market was established in Hungary in the 1990s. This has changed since 2010. Schools can only select books from a pre-compiled list. The list includes textbooks from central textbook publishers, formerly the Hungarian Institute for Educational Research and Development (*Oktatáskutató és Fejlesztő Intézet*) and currently the Educational Authority (*Oktatási Hivatal*). Textbook authors should follow the thematic structure laid down by the curricula. In Hungary, students study geography as a separate subject in the last two years of upper primary education (seventh and eighth grades) and in the first two years of lower secondary education (ninth and tenth grades). Even in comparison to neighboring countries, this is rather low learning time (Probáld, 2017). Given the little number of classes and the significant amount of content to be taught, it is difficult to apply creative teaching methods and create a deeper knowledge and skills in geography (Szilassi & Szőllősy, 2018).

Examining the textbooks and graduation exam contents of several natural science subjects in Hungary, Kónya (2018) finds that the subject of geography has the most content about SD. However, the author also points out that most of the SD topics does not appear in the text to be learned in the textbooks, but only in supplementary materials and readings. Kerényi (2011) conducted textbook analysis in the subject of SD. He analysed volumes of two textbook series from the aspect of how they present the three pillars of sustainability. Based on his results, he concludes that none of the analysed documents discuss the interactions of economy, society and environment. Lükő (2007) conducted a background study in connection with environmental education. The author concludes that the textbooks represent a modern approach to some extent, but they do not have independent chapters dedicated to environmental issues. Horváth et al. (2008) conducted a larger scale textbook research as part of the international BIOHEAD-CITIZEN project. Results show that the textbooks in relevant at the time gave a less complex picture of sustainability. They did not provide a historical context for the SD, and they did not aim to develop a critical attitude. The textbook tasks and questions revealed that the textbooks do not contain an adequate amount of tasks that would make students think, require them to form opinions.

Seres (2021) reflects to the 2020 changes of the Hungarian National Core Curriculum in his study. Among others, the author discusses the decrease in the number of lessons and the consequent increase in the study load. In terms of education for sustainable

development, he mentions the intention present in the latest textbooks to integrate, which was not found in previous editions.

3. METHODOLOGY

3.1 Content analysis

Knowing the circumstances, the main goal of the study is to present the appearance of ESD in the subject of geography textbooks in Hungary. During the research, we counted the number of times the terms „sustainable development" (*fenntartható fejlődés)* and „sustainability" (*fenntarthatóság*) appear in textbooks and how are these concepts is explained. In addition to explicit mention, we also examined the appearance of some aspects of sustainability. To achieve this, we carried out content analysis on Geography textbooks. Similarly, to Nguyen (2019), we used the MAXQDA 2020 (Verbi) programme for the content evaulation. The MAXQDA 2020 software package is a qualitative analysis programme, which allows the categorization of the text and images of Portable Document Format (PDF), Microsoft Word or other text files. Microsoft Excel 365 where used for the aggregation of data and the creation of tables and figures.

Categorization was done with the help of a coding system prepared beforehand. The system was created by grouping the 17 SDG to segments that cover all the environmental, economic, social and political problems of today and the near future (Table 1). The categories created by us were the same ones that were used in a previous study for analyzing NCCs and framework Curricula (Varjas, 2021). We created subcategories within the segments (Table 2), in which we grouped data based on the text type of the textbook.

Table 1: Categories created for the 17 SDGs.

Thematic units of the research	SDGs	Description
Social equality	1. End poverty	Topics in textbooks that address poverty, social hierarchy, and related tensions.
	4. Quality education	Topics in the textbooks, which deal with education, literacy, and their regional differences.
	5. Gender equality	Issues dealing with gender equality and the situation of women.
	10. Reduce inequalities	Topics dealing with marginalized social groups and regional development differences.
Improving living conditions	2. End hunger	Topics dealing with food distribution contradictions, hunger, food waste and sustainable agriculture.
	3. Good health and well-being	Topics dealing with health, birth control, diseases, the problems of aging and younger societies.
	6. Clean water and sanitation	Topics related to water supply, drinking water, and related global challenges.
Sustainable economy	7. Affordable and clean energy	Topics dealing with energy supply, renewable and non-renewable energy sources.
	8. Decent work and economic	Topics related to

	growth	employment, jobs and working conditions.
	9. Innovation and infrastructure	Topics related to infrastructures, research, development, modern industries.
Social and individual responsibility	11. Sustainable cities and communities	Topics dealing with urbanization, the situation of cities, rural areas, and urbanization issues.
	12. Sustainable consumption and production	Topics related to production, shopping, and consumption, with a special emphasis on directing students towards environmentally conscious consumption.
	16. Peace, justice and strong institutions	Issues related to the functioning of states, legislative mechanisms, human and civil rights and responsibility.
	17. Partnerships for the goals	Topics dealing with international cooperation and organizations.
Protection of life on Earth	14. Protection of life below water	Topics related to the protection of oceans, seas and freshwater organisms and water pollution.
	15. Protection of life on land	Topics dealing with the protection of terrestrial organisms and the state of forests.
Climate change and air pollution	13. Climate action	Topics related to global climate change, air pollution and their effects.

Source: author

Table 2: Names and definitions of the category groups used in the categorization of textbook content.

Subcategory name	**Subcategory description**
Textbook core text	The factual content of the textbook is edited in a linear text format, with more important information appearing in boldface type.
Supplementary text	Text not contain boldface information that needs to be learned. Supplementary text usually appears in a separate, coloured box.
Map	Topographic, administrative, and thematic maps in the textbook.
Figure	This subcategory comprises figures showing trends and phenomena, which do not contain data represented by numbers or rates.
Charts, diagrams and tables	Figures including data and rates, as well as text edited as tables.
Photographs and satellite images	Images showing phenomena or persons.
Caricatures	Images representing phenomena or trends as cartoons or in some other humorous way.
Exercises, tasks, and questions	Textbook's forms of questioning of their thought content.

Source: author

In analysing paragraphs from the textbooks, we grouped them in the right category if they were thematically relevant. We included the whole sentence in the coding sheet, we did

not omit conjunctions, articles, end of sentence punctuation and other linguistic tools in their analysis. However, expressions appearing in the cover, in the table of contents, and in the chapter and subchapter titles were not coded. Every textbook published in 2016 and 2021 contains short introductory texts before the chapters, which were also not included in the research.

Certain coded elements were naturally included in multiple categories if they were relevant to SDG of multiple segments. Thematically relevant photographs and figures were also categorized. Captions for them were coded together with the photos as units in the same element (so they do not constitute separately coded elements in the aggregation and evaluation of the data). If a task was linked to a photo or some other supplementary element, the given element was included in the "photographs" and "task" categories as well.

ESD is a relatively new phenomenon, so the main question of the research was how integrated the content of SD content is in documents. To examine this, we analysed the content of the chapters in the textbooks. Our main question was whether ESD is integrated to the main content or are there any separate chapters for the SD topics?

Like former research of this area (see Arrebola & Martinez-Medina, 2018; Nguyen, 2019), we put special emphasis on the analysis of textbook tasks and exercises. Every textbook task or question relevant to sustainable development was added also to the "task" subsegment of the right segment. Similarly, to other studies (e.g. Nguyen, 2019), this was followed by the categorization of each task according to the learning objective levels of Bloom's taxonomy updated in 2001 (see Anderson et al., 2001) (Table 3). In case a task consisted of multiple parts, we chose the highest category present in the given questions.

After that, we wanted to see what role textbook tasks play in the development of competencies relevant to sustainability. Creating the definition of and a system for sustainability competencies has been attempted by numerous studies (de Haan 2010; Cebrián & Pubill, 2014; Stibbe, 2009; Hidalgo & Arjona-Fuentes, 2013; Mogensen & Schnack, 2010; Rieckmann, 2012; de Haan & Rooda, 2010; Lambrechts et al., 2013). Our study looks at the presence of the most relevant competency system—based on works by Wiek (et al., 2011; 2016) and Brundiers (et al., 2021)— in the documents (Table 4). If a task or exercise did not contribute to the development of any competencies, it was not placed in any category of the code sheet.

Table 3: Categorization of tasks and questions relating to SD using the revised Bloom's taxonomy.

Bloom's taxonomy level	Examples of task and question types
Remember	Tasks that require identification and recall.
Understand	Tasks that require exemplifying, summarizing, inferring, compating, explaining.
Apply	Tasks that require executing and implementing.
Analyze	Tasks that require differentiating, focusing, organizing, attributing.
Evaluate	Tasks that require checking (coordinating, detecting, monitoring, testing) and critiquing (judging)
Create	Tasks that require generating, planning, producing.

Source: author based on Anderson et al., (2001)

Table 4: Competencies in analysed in the research.

Competencies in focus	Description of the competency	Question and task types
Future-oriented thinking	The ability to understand the future impact of natural and social trends and processes.	1. Predicting a situation or phenomenon and its effects 2. Recognizing the effects of decisions 3. Vision of future
Value-oriented thinking	The understanding of natural and social values, knowledge, and formation of the individual's own values.	1. Opinion making 2. Environmental awareness 3. Issues of human role in SD situations
Strategic thinking	The ability to recognize problems and plan actions relevant to sustainability issues.	1. Planning 2. Implementation of plans 3. Independent action 4. Problem solving
Interpersonal competency	Empathy, the ability to cooperate with others, and motivation regarding finding solutions to sustainability issues.	1. Teamwork 2. Cooperation 3. Communication tasks (for example presentation) 4. Empathy (other people's perspective)
Problem solving	Multidisciplinary research and solutions to certain challenges.	1. Solution finding 2. Analysis 3. Logical thingking

Source: author based on Wiek et al., (2011, 2016); Brundiers et al., (2021)

3.2 The analysed textbooks

The 2012 and 2020 NCs are currently in force in Hungary. For these two curricula, three generations of textbooks have been completed since 2015 for all grades of geography. The first generation is the experimental textbooks (*Kísérleti tankönyvek*) published in 2016. The next edition of the new generation of textbooks (*Új generációs tankönyvek*), introduced in 2018. The most relevant textbooks published in 2020 have already been published by the Educational Authority (*Oktatási Hivatal*). Generation 3 textbooks for Classes 7 and 8 have not yet been completed, but two versions have been made for grade 9 and 10 textbooks. Textbooks published in 2016 and 2018 reflect the 2012 NCC, while the ones published in 2021 were written in accordance with the provisions and inner structure of the 2020 NCC. Key components of bibliographical data of the textbooks are listed in Table 5.

Table 5: Bibliographical information of the studied textbooks.

Textbook title	Year of publishing	Number of pages	Reference format in the references of the research	Reference format in the text of the research
Geography 7	2016	207	Alexa, P. et al., 2016	2016 7.
Geography 8	2016	208	Kusztor, F. A. et al., 2016	2016 8.

Geography 9	2016	237	Arday, I. et al., 2016a	2016 9.
Geography 10	2016	257	Arday, I. et al., 2016b	2016 10.
Geography 7	2018	191	Kusztor, F. A. et al., 2018a	2018 7.
Geography 8	2018	191	Kusztor, F. A. et al., 2018b	2018 8.
Geography 9	2018	232	Arday, I. et al., 2018a	2018 9.
Geography 10	2018	256	Arday, I. et al., 2018b	2018 10.
Geography 9-10 Volume I, Version A	2021	160	Arday, I. et al., 2021a	2021 9.a
Geography 9-10 Volume I, Version B	2021	216	Kusztor, F. A. – Nagy, B. 2021a	2021 9.b
Geography 9-10 Volume II, Version A	2021	142	Arday, I. et al., 2021b	2021 10.a
Geography 9-10 Volume II, Version B	2021	112	Kusztor, F. A. – Nagy, B. 2021b	2021 10.b

Source: author

4. RESULTS

4.1. The representation of the concept of SD

SD is a significant curricular requirement in Hungary's NCC, both in 2012 and 2020. As a result, Geography textbooks cover a wide range of topics related to SD, such as pollution and global climate change. Year 10 textbooks (2016 10; 2018 10; 2020 10 a, b) have the largest percentage of themes relevant to sustainability as compared to the full text, as shown in Table 6. Their entire final chapter is devoted to questions of long-term sustainability (Table 7). Nevertheless, the concept of SD is rarely used in textbooks, it does not appear in the seventh grade textbook, it appears in the eighth grade in connection with the economic program of the European Union, but it is not explained. In the ninth grade, an explanation of the concept of SD appears in a summary task at the end of a lesson, quoting the Brundtland Commission definition. In tenth grade, the concept gets more emphasis, there is also a separate chapter on sustainability as the last chapter in the grade 10 textbooks.

Table 6: The representation of SD in textbooks

Textbook reference	The proportional presence of SD relative to the entire textbook text	Independent chapter with SD content	Independent lessons with SD content (number of)
2016 7.	7.4%	No	No
2016 8.	9.4%	No	2
2016 9.	9.3%	No	3
2016 10.	22.6%	Yes	13
2018 7.	5%	No	No
2018 8.	8%	No	2

2018 9.	6%	No	3
2018 10.	15%	Yes	16
2020 9a	10%	Yes	10
2020 9b	20%	No	4
2020 10a	15%	Yes	9
2020 10b	28%	Yes	10

Source: author

The chapter on sustainability of the experimental textbook (*Kísérleti tankönyv*) published in 2016 first introduces social problems (of urbanization, population and nutrition), then proceeds to discuss more general issues of sustainability. It teaches about the sustainability of economy. It talks about issues of mining, energy production and consumer society. The following figure (Figure 1) raises the students' awareness of Earth-Overshoot Day.

Figure 1: Textbook figure presenting the dates of overshoot days between 1981 and 2014 (2016. 10., 249, language translated from Hungarian)

The version A of the most recently published year 9 textbooks (2020 9a) also include a chapter discussing the sustainability issues of the Earth (titled "Local issues, global challenges"). Besides global environmental problems, it also discusses social challenges (such as urbanization and food production) in an independent chapter.

Table 7: Lesson titles of textbooks having independent chapters on sustainability. Content marked with * are considered supplementary materials

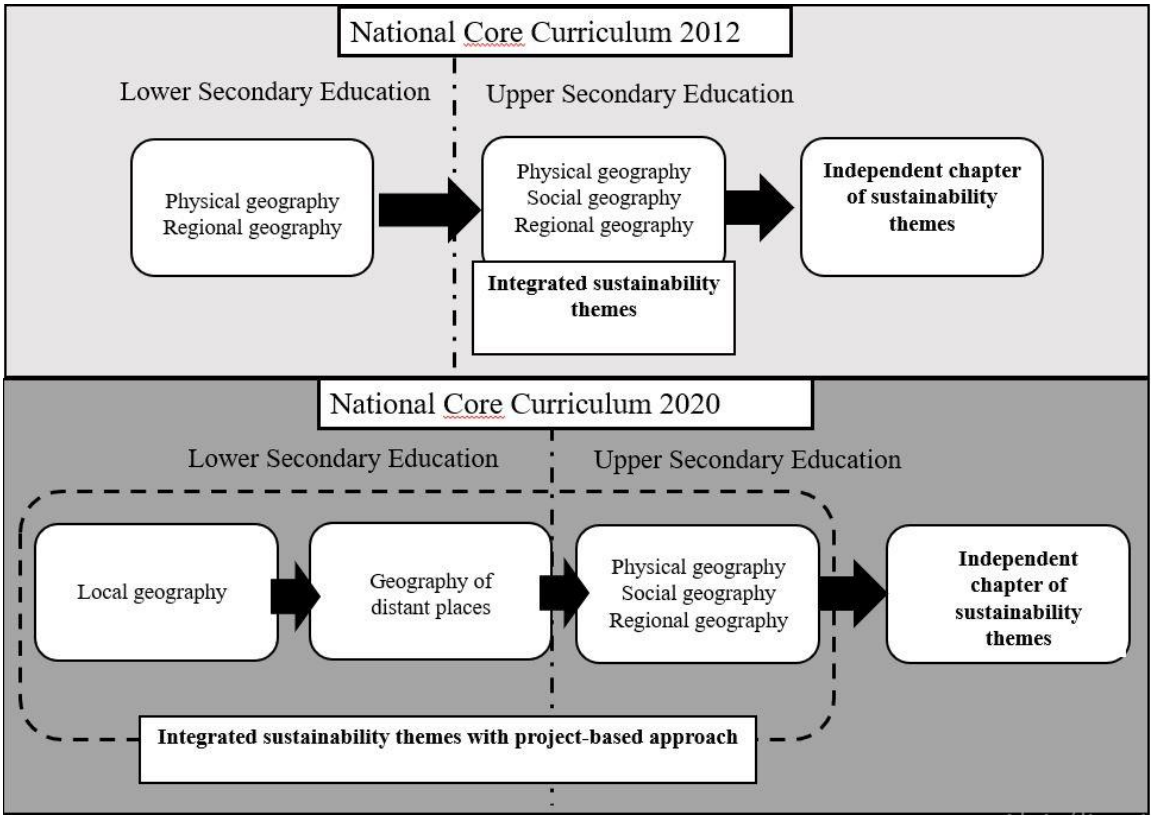
Textbook reference	Title of the independent or partly independent chapter
2016 10.	Issues of expansive and constrictive population pyramids – Problems of population Is there enough food for everyone? – Food crisis Gigantic, growing cities – Problems of urbanization Be more economical, be more efficient! – Question marks of sustainable development Protect the environment! – We can only do it together Tasks – Sustainability
2018 10.	Be more economical, be more efficient! Are we about to use up our resources? Mesmerized by sustainability Question marks of sustainability Vulnerable geospheres From climate change to wild fires People and settlements Smart people in smart cities Global issues Recognize it!
2020 9a	From local to global Changing atmosphere Our waters in danger Interfering with land and landscape Issues of food production Population challenges Urbanization challenges Summary
2020 10a	The limits of growth Are there enough raw materials? Is it sustainable? On the verge of a new industrial revolution? World in motion* From well-being to prosperity* Are robots the future?* Summary
2020 10b	Is growth sustainable? The contradictions of consumer society Nations falling behind – unique challenges Climate change – The adaptability race Scarce water reserves Changing energy management Is there too many of us on this Earth? Is your city sustainable? – Practical lesson Summary

Source: author

Most textbooks do not have an independent chapter dedicated to SD, but with the exception of two, all of them include independent lessons discussing various segments of SD (Table 7). Sustainability is not only present in independent chapters and lessons, it also appears integrated in other chapters. Year 9 and 10 secondary school textbooks teach Geography dividing the subject into geographical spheres (lithosphere, atmosphere and hydrosphere). In discussing each geographical sphere, separate lessons deal with the relationship between the sphere and society. Global issues are also discussed here. However, this way of processing the subject is only present in secondary education; younger students (years 7 and 8 of primary school) have less SD content in their textbooks (Table 7).

The inner structure of the subject went through significant changes with the publishing of the 2020 NCC and the Geography framework curriculum. The change is shown by Figure 2. In primary school, instead of a thematic structure following the inner structure of geography as set by the Hungarian Academy, students gradually move from studying their direct surroundings to learning about more distant places. For every thematic unit, the framework Curriculum recommends problem-based project tasks addressing the challenges and future development of the given unit. In connection with their living environment, they encourage students to address local challenges. In secondary school, the Curriculum returns to a thematic structure bey teaching about geographical spheres. It adds more complex and deeper knowledge to the topics that had less focus in primary school. The different approaches of the 2012 and 2020 framework Curricula as they are represented in textbooks cannot be studied yet, as due to the gradual introduction of the changes, new editions of primary school textbooks will only be available from the first half of 2022.

Figure 2: Structural differences between the two NCC and the educational approach of ESD

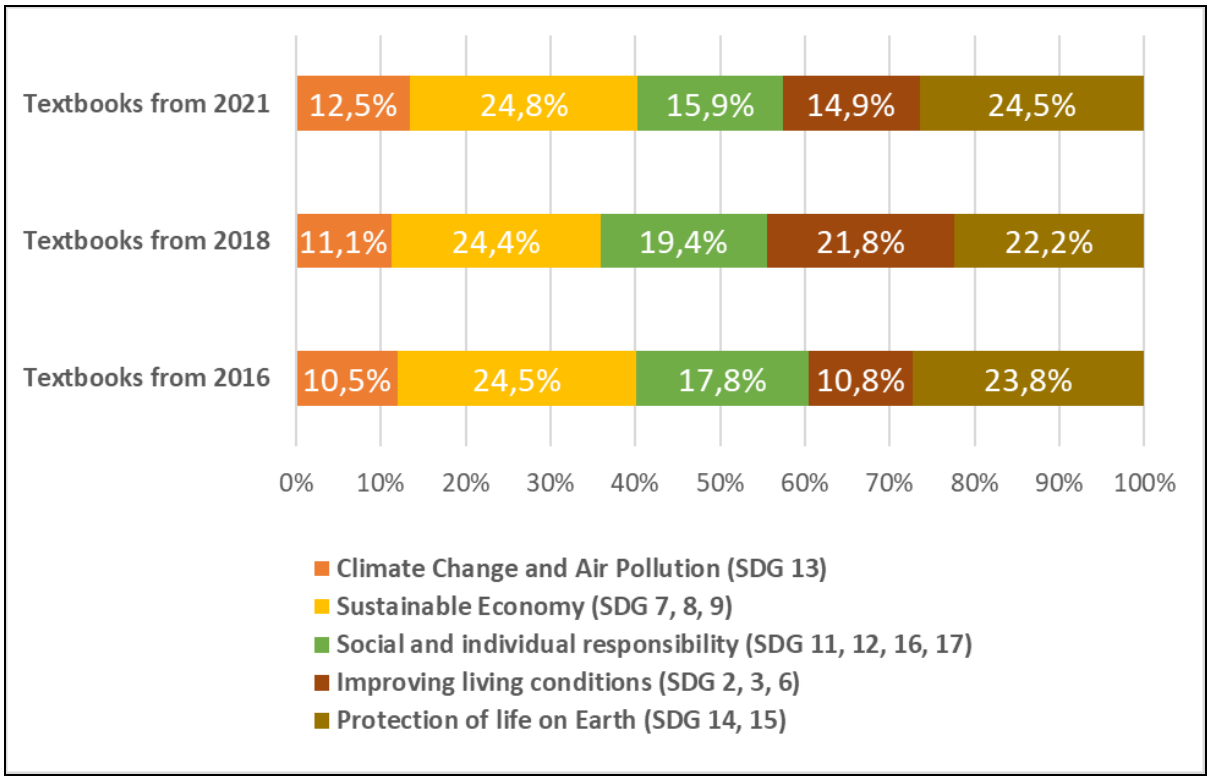


4.2. The presence of sustainable development segments

Our hypothesis was proven, as the textbooks, similarly to results found recently in connection with other countries (Boehn & Hamann, 2011; Kowasch, 2017; Nguyen, 2019; Bagoly-Simó, 2013), were prepared mainly with ecological aspects in mind. In the studied textbooks of all four years, sustainable economy (SDG 7, 8, 9) is discussed the most (Figure 3). A significant number of textbook contents was dedicated to the protection of life on Earth (SDG 14, 15). Another segment relevant to environmental sustainability, “Climate Change and Air Pollution” accounted for 10–12% of the textbooks’ ESD content. Two segments relevant to social sustainability (“Social and individual responsibility”, “Improving living

conditions") were present more in textbooks published in 2018, but in 2016 and 2021 textbooks they were only 15%.

Figure 3: The relative proportions of the different SDG projections for total encoded SD content, broken down by release year.

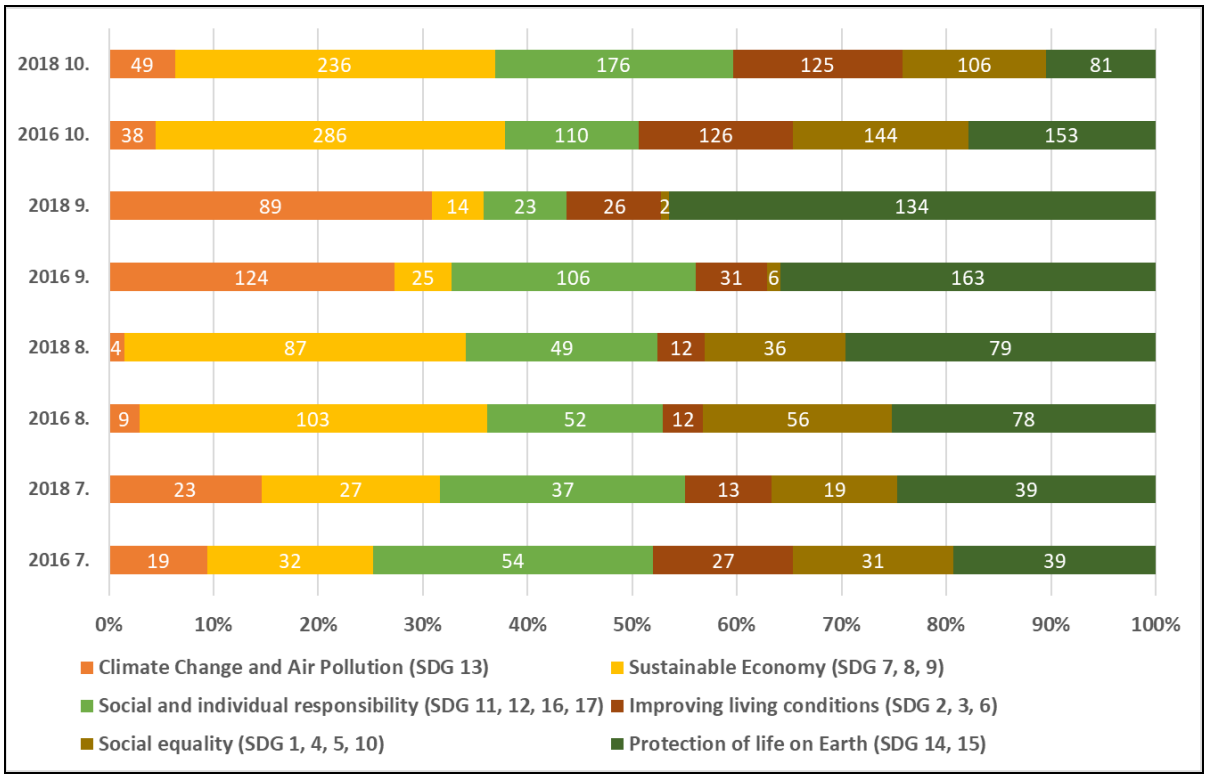


The natural and social approaches of Geography are applied in the 2012 National Core Curriculum so that students in years 7 and 9 mostly study natural geography, while in years 8 and 10 they are taught more about economic and social geography, as well as the geography of various regions. As Figure 4 shows, this division is apparent in the discussion of the given segments of sustainable development too. In year 9, where students hear very little about social and economic trends and processes, the main emphasis falls on natural sustainability and the impact of climate change. This phenomenon in especially strong in the year 9 textbook published in 2018. The 2020 National Core Curriculum proposed a different subject structure for primary education, but that cannot be researched yet, as the new textbooks are not available.

The main text of the textbooks mentions every sustainability segment. Every edition raises awareness of the importance of environmental protection, conscious shopping, and the protection against climate change, for example. The most neglected area of sustainability is the study of socio-political issues. Textbooks talk more about the problems of previous (Balkan nations) and current conflict zones (Middle East), as well as disputes that developed due to environmental difficulties (for example the relationship between Egypt and Ethiopia), but they fail to highlight the importance of cooperation between societies. They mostly use the concept of integration in its economic sense; they do not talk about the peaceful cooperation for SD. Relevant to climate protection and environmental issues, they repeatedly point out the importance of global cooperation as well as independent, individual actions, but they do not do the same in connection with addressing social problems. They hardly mention global educational trends and the situation of women, which are also matters

of sustainability, similarly to other results (Nguyen, 2019). When these topics come up, usually negative examples are used (such as the literacy rates of African countries).

Figure 4: Number of coded paragraphs for different SDG projections, by year of textbook publication and by grade. Each coded text can be linked to more than one SDG.



4.3. Textbook tasks and exercises

Modern Geography education in Hungary has to be done in an action-oriented way, which requires a methodological shift as well (see for example Szilassi & Szőllősy, 2018; Farsang & Ütőné, 2020, Seres, 2021). Textbooks are an important part of the teaching and learning process in the way they help the lesson preparation of teachers and the students' work both in and out of the classroom. The textbooks that place adequate emphasis on competence development and use interactive tasks to help students get a deeper understanding of the subject are more successful in environmental education, which is considered an important goal in Hungarian Curricula. Hungarian Geography textbooks educate through a high number of tasks and questions (Figure 5, Figure 6, and Figure 7). However, these tasks mostly only ask the students to simply recall information. These tasks do not require the activation of students' higher level thinking processes, and they do not contribute to the significant improvement of competencies. There is also a high number of tasks that require understanding and explaining, especially in the first generation of textbooks.

Textbooks published in 2016 and 2018 (Figures 4 and 5) partly put a bigger emphasis on developing higher level thinking and problem solving. The number of analytical tasks asking for looking at a set of problems or a situation from multiple perspectives has increased in more recent editions of textbooks. But particularly high figures can only be seen in year 10. The chapter on sustainability is at the end of year 10—but as it has been mentioned, reaching the final chapter of the textbook is difficult due to the number of lessons reduced in the 2020 NCC. The most recent editions of textbooks have a significantly lower page count (Table 4), and each lesson takes up 2 pages instead of the previous 4. Having

less material to learn would help to get a deeper understanding of the topics, to integrate more reflections and tasks that require the application of knowledge. However, in the 2020 edition secondary school textbooks, the number of tasks in which are reduced (Figure 4). Furthermore, Seres (2021) concluded in his analysis of the framework Curriculum that the number of definitions to be taught as set by the framework Curriculum has increased due to the decrease in the number of lessons compared to the 2012 framework Curriculum, so now students have to learn proportionally more in less time given. That means that even less capacity is left for ESD and learning about global issues. Tasks asking for higher level learning objectives (evaluation and creation) that play a big role in developing critical thinking and a readiness to act in students are only present in low numbers. There is only one edition (2021 10b) in which tasks that can be classified as creation—i.e. which involve the production or design of something—constitute more than 10% of all the tasks in the textbook.

Among all the tasks of textbooks, tasks requiring lower levels of knowledge are less suitable for developing competencies. Table 7 shows that less than 50% of all the tasks found in each textbook relevant to sustainable development and global issues—with the exception of textbook 2021 10.a— contributes to competence development. Most competence-oriented tasks activate problem solving skills. These tasks ask students to gather and process information, and to recognize and manage problems. The most neglected competency is strategic thinking, which requires decision making and long-term planning skills. This competency could brace students with adaptability in an uncertain future.

Figure 5: Tasks representing various levels of Bloom's taxonomy in textbooks published in 2016, by year. The number above each column represents the task number (edited by the author)

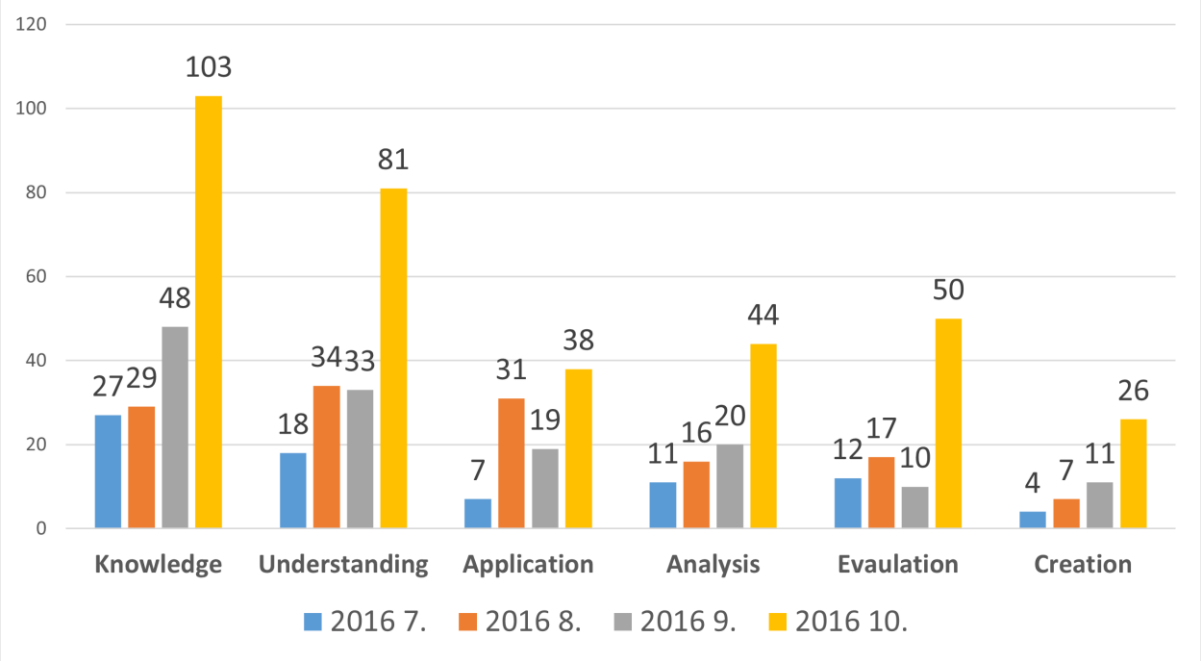


Figure 6: Number of tasks representing various levels of Bloom's taxonomy in textbooks published in 2018, by year. The number above each column represents the task number (edited by the author)

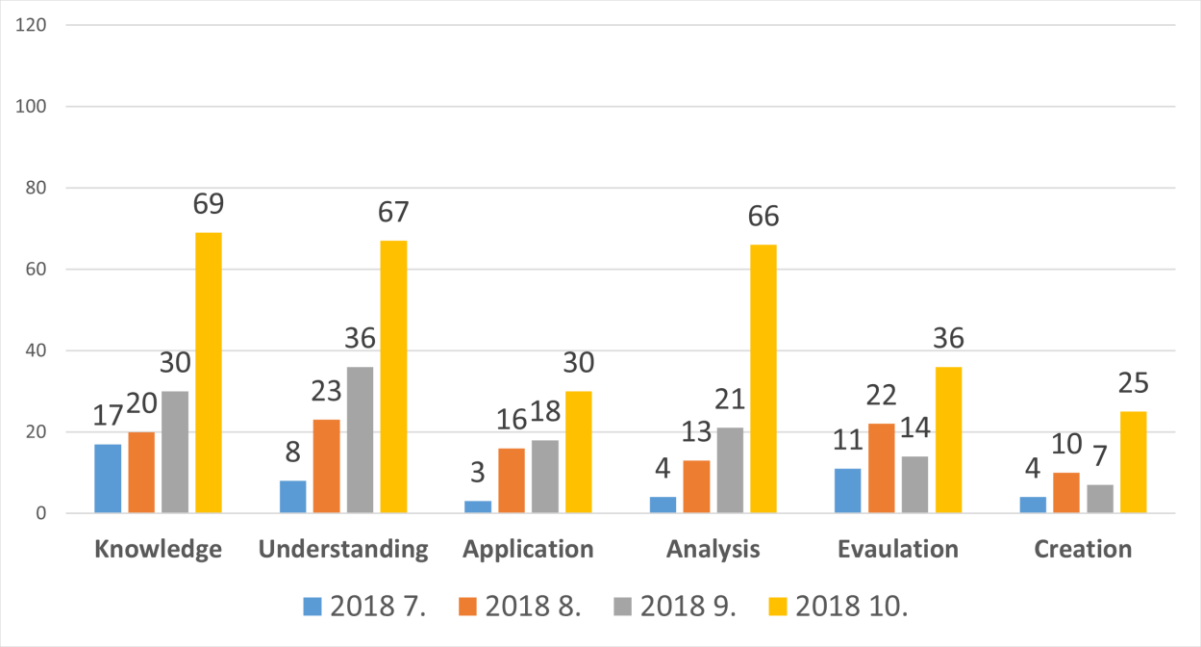


Figure 7: Number of tasks representing various levels of Bloom's taxonomy in textbooks published in 2021, showing both year 9 and 10 textbook series. The number above each column represents the task number (edited by the author)

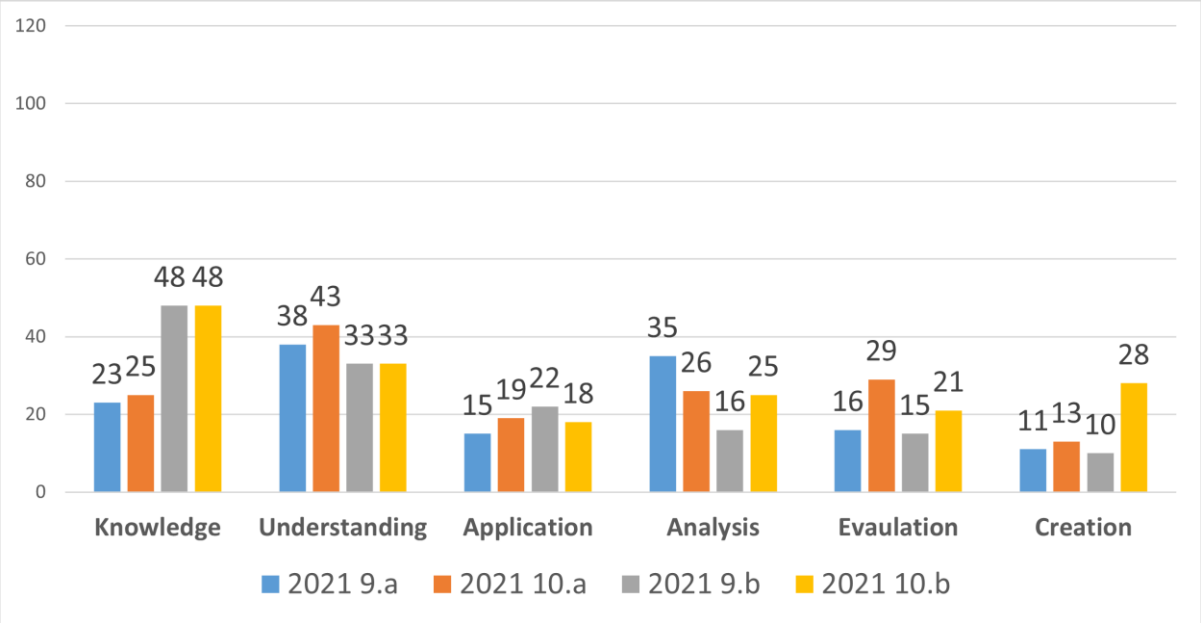


Table 7: The number of competencies present in the textbooks, and their proportion relative to the total number of tasks found in the books by percentage

	2016 7.	2016 8.	2016 9.	2016 10.	2018 7.	2018 8.	2018 9.	2018 10.	2021 9.a	2021 10.a	2021 9.b	2021 10.b
uture-oriented thinking	4	10	9	18	3	8	8	20	6	13	7	17
Value-oriented thinking	3	10	6	27	3	5	9	22	10	22	10	30
Strategic thinking	6	6	4	11	0	7	1	8	4	6	4	8
Interpersonal competency	8	9	5	21	4	10	5	25	8	18	7	13
Problem-solving	5	18	6	37	5	15	21	32	19	26	21	43
Total number of competency tasks	**26**	**53**	**30**	**114**	**15**	**45**	**44**	**107**	**85**	**47**	**49**	**111**
Total number of tasks	78	145	163	389	60	125	127	349	167	215	171	244
Percentage	**33.33**	**36.55**	**18.40**	**29.31**	**25.00**	**36.00**	**34.65**	**30.66**	**50.90**	**21.86**	**28.65**	**45.49**

Source: author

5. DISCUSSION

Previous Hungarian studies investigating the presence of environmental education in geography textbooks (Lükő, 2007; Horváth et al., 2008; Kerényi 2011) tended to paint a negative picture of the situation of the textbooks current at their time. The situation seems to be improving. Hungarian textbooks now discuss the complex interrelation of nature, economy, and society, providing several examples of how these systems affect each other. Contrary to the former practice in Hungary (see Lükő, 2007), the relevant textbooks have independent chapters dedicated to sustainability. Sustainable development and sustainability are processed in separate chapters and integrated with other topics, despite the fact that the concept itself is rarely applied or its meaning explained.

Nguyen's (2019) study on the appearance of SDGs in Vietnamese geography in textbooks concludes that the protection of life on Earth and life in water has received the most attention. The results in Hungary are different. The protection of marine life receives less attention, which may be due to the fact that Hungary is a landlocked country. Hungarian rivers appear in textbooks, and the textbooks also draw attention to the importance of co-operation with neighboring countries in the treatment of water-related problems. Vietnamese textbooks (Nguyen, 2019) do little to address sustainable economic issues and play a much larger role in Hungarian books. Overall, they are diversified in terms of topics, imparting the academic knowledge required for SD.

However, a major obstacle to the transfer of academic knowledge may be that the chapters on sustainability have been segregated at the very end of 10th grade textbooks. The lack of emphasis on the development of environmental attitudes can be considered a shortcoming of textbooks, especially in the lower grades. Despite the fact that environmentally conscious education should start as early as possible (see e.g.: Leeming et al., 1997). Teaching students about sustainability earlier is also made difficult by the fact that textbooks written for years 7 and 8 have proportionally the lowest SD content (Table 7).

Textbooks tasks and questions, similar to international results (Kowash, 2017), rarely contain playful elements, yet strive to present topics that are often abstract to students, difficult to understand, using everyday examples. With the help of the textbook, students can develop an environmentally conscious household, an energy-saving lifestyle, and similiarly to Boehn & Hamann's (2011) findings in German textbooks, draw attention to sustainable tourism by reducing their ecological footprint. But the tasks rarely go beyond asking for information back and simply understanding it, as we can see this similarly in international practice (Arrebola & García-González et al., 2021; Nguyen, 2019). We can see that the teaching of SD and sustainability should not stop at this level (United Nations 2012; Biström & Lunström, 2021). Further steps need to be taken to achieve higher levels of Bloom's taxonomy for students. Be able to analyze situations from several perspectives, form independent opinions, learn research method in order to be able to help their environment on their own.

In terms of competencies, thinking about the future is not given enough emphasis. As can be seen from the results of Boehn & Hamann (2011), the concept of the ecological footprint also appears in Hungarian books, and students has to measure their family's footprint, students also have to interpret the future effects of certain situations and phenomena, but they do not deal with these topics in sufficient quantities. In order to achieve sustainability, students need to be introduced to solution proposals (Boehn & Hamann, 2011). Such items only appear at the end of 10th grade textbooks, but inadequate amounts. The presentation of the solutions would also create an opportunity to develop strategic competence, which, as the results show, is not enough in the textbooks.

6. CONCLUSIONS

The aim of the study was to present the ESD contents of the relevant geography textbooks. The results of the content analysis show that an adequate amount of SD topics appear in them, but in an unintegrated way due to the unfavorable distribution. The 2020 NCC envisaged a reduction in the number of lessons and curricula for the subject of geography. Although the number of concepts to be learned has decreased, a relative increase in concepts can be observed as a result of the reduction in the number of lessons (Seres, 2021). This situation further complicates the situation of environmental education, as ESD content that is not yet sufficiently integrated can easily become one of the less important topics that does not necessarily need to be taught.

The formation of an environmental approach as well as an action-oriented approach are also incomplete in the textbooks. In few cases, students are expected to try to solve global problems even in their immediate environment. The tasks of textbooks therefore usually impart the necessary conceptual knowledge, but do not impart the skills needed for strategic thinking, anticipation, or holistic or even global thinking. Global problems seem remote, it is not emphasized that even global climate change can make a huge difference in the lives of young generations.

The ESD in geography textbooks be related to Bokor's (2015) statement about ESD in Hungary. It is important that the textbook does not necessarily aim for value neutrality in the subject, as we are talking about global problems that do not appear in 10 or 20 years, but we are already feeling their effects. Students' attention should be drawn to the fact that the growth of humanity and technological development play a major role in the development of global problems, which is not the goal of textbooks in Hungary or from other countries (Tracana, 2008; Boehn & Hamann; García-González et al., 2021; Kowash, 2017). In the same respect, it is worth talking about the fact that the historical context does not receive enough attention, which would be much needed (Mónus, 2020).

The study did not conduct complex research in that it did not conduct teacher-related research, nor did it examine how textbook content reaches students and influences their

thinking and behavior, which is an important function of ESD. These studies may be further research directions.

DECLARATION OF INTEREST

The author received no financial support for the research, authorship, and publication of this article.

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