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The role of a geography textbook in developing key competences – a comparative study

Abstract

A textbook plays an important role in modernization of the teaching process and in the achievement of set teaching objectives. From a didactic perspective, very important is the structure of contents that activates a school student via e.g. a set of didactic tasks. It seems important in the context of developing self-study and long-life learning skills of school students. Self-study becomes a necessity in the modern society due to technological advancement and constantly growing requirements of the labour market. The purpose of the research was to determine the degree to which the contents and didactic tasks contained in contemporary geography textbooks facilitate the development of subject-specific skills and key competences. The degree of overcoming deeply-rooted traditional methods of teaching geography to school students and the extent to which the proposed teaching solutions serve as a source of educational innovation for teachers. The research covered 7 out of 11 geography textbooks approved by the Ministry of National Education (MEN) for the first class of lower secondary schools.

Key words: geography; geography curriculum; geographical knowledge and skills; key competency; textbook.

Introduction

Geography, as an interdisciplinary subject, may play an important educational function in the process of teaching and learning. When dealing with the issues of human-environment functioning and interactions one tackles a number of every-day problems, which offers a great opportunity for acquiring knowledge and developing various skills, including the skill of evaluating the changes taking place in the surrounding world on a local and global scale. It is a potential of this subject mentioned by geographers, geography didactics specialists, and geography teachers (Nałkowski 1908; Flis 1979a; Liszewski 1999). In addition, it represents a considerable didactic challenge faced by the authors of geography textbooks and geography teachers, as due to highly diversified contents, it is difficult to devise a consistent model for teaching this subject, which would reflect different cognitive approach of physical and of human geography. This challenge is systematically

addressed by geography teachers and didactics specialists; yet, as it appears from various reports and research projects, geography is continually being accused of being dominated by facts and numbers and of adhering to encyclopedic approach in the teaching process.

The key objective of the study was the identification and assessment of the role of geography textbooks in the pursuit of set teaching objectives described in the core curriculum for lower secondary schools, including the development of key competences. The objective included the following goals:

- diagnosing and evaluating a textbook concept in the context of pre-defined teaching objectives and developing key competences, on the basis of textbooks for the 1st grade of the lower secondary school (13–14 year-olds),
- analysing didactic tasks and assignments in the 1st grade textbooks from the perspective of developing subject-specific skills and key competences,
- analysing core curriculum for the 3rd level of education, including geography, from the perspective of developing subject-specific skills and key competences.

The analysis applied to the structure of contents and types of didactic tasks included in geography textbooks for the first grade of lower secondary schools. Presently, geography teachers can choose between 11 geography textbooks approved by MEN for lower secondary schools. The present analysis covers a preliminary survey of 7 of them.

Competences – concept and examples in the core curriculum

The term “competence” originates from a Latin word *competentia* meaning “appropriateness, agreement”. Etymologically, “competence” may be defined as the scope of powers of a person to undertake specific actions, based on the “appropriateness” of the person’s knowledge and skills. In pedagogy, there is no uniform definition of the term. For the purpose of the present paper, a definition formulated by W. Strykowski (2003) and Furmanek (et. al. 2007), Rodzoś (2011) is adopted, where it is understood as readiness to perform tasks on a specific level, comprised of three components: intellectual (pertaining to knowledge), operational (pertaining to skills), and motivational (readiness to act).

In the new core curriculum (from 2009) for general education, key competences are not explicitly defined. This does not mean, however, that the issue has been ignored. The document defines “the most important skills” for each level of education. Detailed analysis of the teaching contents for the 3rd and 4th level shows that these skills cover the skills mentioned by OECD, European Parliament, and *Creator Programme* (table 1). For example, the ability to read and communicate in the mother tongue and in foreign languages (orally and in writing) is a component of competences defined by the European Parliament as the ability to communicate in the mother tongue and in foreign languages, while by OECD as the ability to communicate in more than one language. Scientific knowledge is a basic component of competences in the area of natural sciences and technical subjects. The ability to easily use modern IT and telecommunication technologies is defined as IT competences (IT literacy). In a broader sense, IT competences also include the ability to use various sources of information, to combine and organize various portions of knowledge,

as well as to search for, select and critically assess information. The ability to recognize own educational needs coincides with the learning competence and with planning, organizing, and assessing own learning and work (table 1). The ability to work in a team falls within the scope of social and civic competences, including the ability to listen to others and to take their views into consideration, which is included in the OECD list. The *Creator Programme* describes these skills as effective communication in various situations and effective cooperation.

Tab. 1. Examples of skills and key competences in same documents

Skills for the 3rd level (Core curriculum 2009)	Key Competences, (OECD 1996)	Key competences in long-life learning (European Parliament 2006)	Competences in <i>Creator Programme</i> (1998)
<ul style="list-style-type: none"> – reading – understanding, using and conscious processing of written texts, – mathematical thinking – the use of mathematical tools in every-day life, – scientific thinking – using knowledge to identify and solve problems, as well as to formulate conclusions based on empirical observations concerning nature and society, – communication in mother tongue and in foreign languages, – It literacy, – searching for, selecting and critically assessing of information, – ability to see individual educational needs, – team work. 	<ul style="list-style-type: none"> – team work, – It literacy, – problem solving, – communication with others, – communication in more than one language, – organizing individual portions of knowledge, – using various sources of information, – dealing with the uncertain and the complex, – organizing and assessing own work. 	<ul style="list-style-type: none"> – communication in mother tongue, – communication in foreign languages, – mathematical competences and basic scientific competences, – It competences, – ability to learn, – social and civic competences, – initiative and entrepreneurial attitude, – cultural awareness and expressiveness. 	<ul style="list-style-type: none"> – planning, organizing and evaluating own learning, – successful communication in various situations, – active participation in a team, – creative problem solving, – computer literacy.

Source: author’s work based on *Podstawy programowe...* (2009), *Creator Programme* (1998), *Zalecenia...*, 2006

The core curriculum for geography in lower secondary schools (3rd level of education) also includes the skills which are consistent with some competences in the list of OECD, European Parliament, and *Creator Programme*. One of the major objectives of teaching geography at this level is: “the use of various sources of geographic information”, which is very closely related to IT competence defined by the EP, and with the ability to use various sources of information formulated by OECD (table 1).

The objective of “identifying relations and interdependencies, as well as explaining phenomena and processes” is an element of competence defined as the ability to communicate in mother tongue. This occurs, *inter alia* through using and understanding geographical terms and through competences in the area of natural sciences and technical subjects, which are developed in the course of developing geographical skills (such as reading and interpreting maps, using geographical methods to learn about the phenomena and processes in the human-environment relations, their description and explanation). “Practical use of geographical knowledge and skills” can be categorized as the ability to solve problems (practical and theoretical ones). One of the major objectives in teaching geography – developing attitudes – is an important element of developing social and civic competences, as well as cultural awareness and expressiveness which can be developed due to the diversity of geographic contents (Flis 1979b; Tracz 2008).

Teaching objectives prescribed in the core curriculum focus the teaching process onto a new direction, recommending educational activities aimed at developing various skills important for subsequent teaching, social and professional life. Description of the teaching contents, including the most important skills, is consistent – although not directly – with the lists of competences of OECD and the European Parliament. The purpose of geography as one of the general education subjects is to teach and develop these skills and, thus, to facilitate the development of key competences. General and detailed objectives show directions for authors of geography textbooks and teachers. The essence of geographical teaching at this level of education is, *inter alia*:

- comprehensive presentation of functioning of the natural environment and humans as a system of interdependencies and interconnections,
- regional perspective in learning the natural, social, and economic diversity of human activity
- equipping with geographical knowledge and developing geographical skills, including geographical thinking and its practical application (Pulinowa 1994; Rodzoń, et. al. 2008).

The concept of a geography textbook in the context of changes introduced in the core curriculum

Textbooks, despite the growing importance of the Internet in accessibility of information, are still an important means in teaching geography, used not only by school students but also by teachers. A textbook reflects the teaching concept adopted by the authors, thus suggesting to teachers the didactic tools to be used in practice. From this perspective, it becomes an important tool helping to propagate new teaching ideas envisaged in public education documents – core curriculum. Also the teaching contents included in textbooks, their choice and arrangement, should reflect the current level of geographical knowledge, thus enabling school students to learn the truth about the world and its complexity.

According to M. Kucharska (2009: 127), one of the key tasks of a modern geography textbook should be the presentation of various ways to use knowledge, the development of operative knowledge and organization of knowledge acquired by school students from sources other than a textbook. This suggestion is closely related to the idea of developing competences in the process of teaching and learning geography, particularly those described in general objectives of the core curriculum.

How are these underlying objectives of the core curriculum being achieved in geography textbooks currently used in lower secondary schools?

The content of the seven analysed textbooks, in terms of their scope, is very similar and covers physical geography issues prescribed in the core curriculum and a commentary for implementation in the first grade of the lower secondary school. Only the textbook published by SOP in Toruń includes some issues on physical and social geography of Europe.

In theory, in order to successfully perform its educational functions, the structure of a textbook should be very well thought out. Many researchers attribute various functions to textbooks, and currently more and more frequently its multi-functionality is being emphasised. Important from the perspective of developing skills and competences is, *inter alia*, research, self-study, and motivational function. These functions facilitate the development of various skills, such as: using various sources of information; organizing and assessing own work; organizing, analyzing, and evaluating available information; identifying, defining, and solving problems.

The research function, most often demonstrated as presentation of contents in the form of a problem-solving task, offers school students an opportunity to carry out individual research through taking measurements, observation, developing planning skills, organization and performance of a task, evaluation of the undertaken actions. In the analysed textbooks intended for the first grade, the informative function is dominant, where knowledge is presented through description, ready-made explanations of appropriately selected graphic material (drawings, photographs, tables) not always fully linked to the text (table 2).

In the light of underlying assumptions of contemporary education, topics discussed in a textbook should serve as a basis for developing geographic and formal skills. Therefore, the authors should smoothly move from informative to trans-informative, research, and self-study functions. Unfortunately, in none of the researched textbooks any attempt was made to present geographic topics in a problem-solving manner, although many issues contained in the core syllabus to be taught in the first grade could have been easily presented in this way. Lack of this function in the analyzed geography textbooks considerably limits the opportunity to develop and expand school students' skills of posing questions or spotting and defining problems in the surrounding reality. Textbook authors focus on structuring function by organizing the contents in order to create a highly hierarchical structure comprehensive for a school student, preferring learning through memorization of facts and definitions. At the same time, such organizing of knowledge is used to define the scope of knowledge prescribed in the core curriculum and checked during exams.

The self-study function serves the purpose of encouraging school students to use sources of information other than a textbook and to broaden their knowledge, to conduct observations and research based on methods learned. This objective may be achieved, *inter alia*, through adequate selection of teaching contents and didactic tasks. The analysis of selected textbooks shows that authors relatively rarely draw school student's attention to the need for seeking information in other sources. The exceptions are: *Puls Ziemi* (Wydawnictwo Nowa Era), *Geografia* (Wydawnictwo Z. Dobkowskiej) and *Świat bez tajemnic* (Wydawnictwo Szkolne PWN), where in

Tab. 2. Structure of Geography Textbooks for First Grade of Lower Secondary Schools

Author, title, publisher	No. of pages	Teaching concept	Innovations	Text and illustration material
R. Malarz: <i>Puls Ziemi</i> , Nowa Era, 2009. (1)	185	direct teaching with elements of pro-active teaching	set of assignments after each thematic section motivating contents: “important and interesting”, “what is your opinion?”	illustrative material dominates, no references to photographs or drawings
R. Malarz: <i>Planeta Nowa</i> , Nowa Era, 2009. (2)	175	direct teaching	set of tasks after each thematic section motivating contents: – “through the eyes of a traveller”	illustrative material dominates, little connection between illustrations and text contents
E. Dudek: <i>Geografia bez tajemnic</i> , Wyd. Wiking, 2009. (3)	200	direct teaching	Special typeface of terms and selected facts distinctive self-study section	text dominates, illustrative material not fully used for educational purposes
M.M. Wilczyńska-Wołoszyn, R. Domachowski: <i>Geografia</i> , Wyd. Edukacyjne Z. Dobkowskiej „Żak”, 2009. (4)	128	direct teaching with elements of pro-active teaching	distinctive progress checking section	illustrative material linked with the text
M. Adamczyk G. Wnuk Z. Wojtkowicz <i>Ziemia i ludzie</i> , Wyd. SOP Toruń, 2009. (5)	136	direct teaching with elements of pro-active teaching	introduction of elements of history of geography distinctive progress checking section	illustrative material not fully used for educational purposes
A. Lechowicz, M. Lechowicz, P. Stankiewicz <i>Bliżej geografii</i> , WSiP, 2009. (6)	175	direct teaching with elements of forming evaluation	key questions set of tasks after each thematic section introduction of “geography in practice” topics	illustrative material linked with the text
J. Kop, M. Kucharska, A. Witek-Nowakowska <i>Świat bez tajemnic</i> , Wyd. Szkolne PWN, 2009. (7)	213	direct teaching with elements of pro-active teaching	important terms and facts highlighted distinctive progress checking section	highly structured text illustrative material partly linked with the text

Source author's work based on geography textbooks

some tasks the authors recommend that school students use the Internet, encyclopedia, a dictionary, or a CD-ROM enclosed to the textbook in order to complete the task. A didactic innovation here as regards self-study is a set of didactic tasks to be completed by school students in order to check and assess their knowledge, ending each thematic section in some textbooks (table 2). In some other textbooks, the sections devoted to review of skills and knowledge are highlighted.

It should be noted that modern geography textbooks feature lots of illustrative material which is a valuable source of geographic information. Unfortunately, the educational potential of illustrative material is not fully utilised by authors for educational purposes. Photographs, graphs, charts, diagrams in the majority of the analysed textbooks are not treated as an equally important source of information, are often included in textbooks as a fun fact or an element making the text itself more attractive, but not as an important material helping to acquire knowledge or understand a given phenomenon. Due to technical possibilities and availability of graphic materials, some authors and editors lost from their sight the rationale behind and the basic function of visualisation in the teaching process. Some textbooks are overloaded with illustrative material and resemble an interesting album, thus distracting school students' attention from the actual contents (table 2). There is also the issue of quality of captions to the illustrative material – they are often too general, although an illustration presents a very specific geographic object having its own name (Tracz 2014a, 2014b).

In order to encourage school students and arouse their curiosity in the contents taught, namely in the natural phenomena and processes taking place in the world around them, some authors use “teaching via dialogue” method, addressing school students directly, asking them questions, leading them step by step to a solution. A good way to motivate students is to highlight some sections, e.g. “in short”, “what do you think”, “geography in practice”, “how to do/make it”. Another trick is chapter headings in the form of questions, arousing interest in the issues discussed (e.g. “Can there be no weather at all?”) – they are more comprehensible to students than typically academic phrases (e.g. “Weather and Climate”).

One of the conclusions after the analyses of seven geography textbooks for the 1st grade of lower secondary school is that the solutions adopted by individual authors to a varied degree follow the recommendations included in the core curriculum as regards changes in the approach to teaching geography and pursuit of set objectives. Authors are still focused serving school students specific amount of “ready-made” knowledge they should acquire. Such an approach does not offer many opportunities to activate school students in the course of teaching and learning process. Yet, some authors have made attempts to abandon encyclopaedic method of teaching geography.

Activities in geography textbooks – examples from a lower secondary school

Activities constitute an important component of a textbook as they stimulate a school student to engage in various cognitive and technical processes. There are several definitions of this term in the publications concerning the subject. Adopted for the purpose of the present study is the definition of activities coined by D.

Licińska (1990: 10), defining a task as a “set of consciously inspired actions aimed at achieving pre-set objectives”. Hence, a task must inspire a student who wants to (or must) act to perform a set of activities prescribed in the task. In order for a task performed by a student to have some deeper sense, it must lead to achieving a pre-defined objective. An overriding objective of a task is to facilitate changes in the personality of a student and develop thinking. As teaching objectives are diverse, a textbook should contain diversified activities introducing new knowledge and information, facilitating planning and coordinating self-study, as well as checking progress in acquiring new knowledge and skills.

It appears from the analysis of tasks in the studied textbooks for the first grade of the lower secondary school that the activities aimed at introducing new knowledge consist mainly of searching for information in specified sources or in describing characteristics and the course of a phenomenon discussed. The analysis of tasks from the perspective of students' cognitive activity shows the domination of reproductive and algorithmic tasks in 1st grade textbooks (figure 1). A considerable percentage of such tasks in textbooks is indicative of a preferred concept of teaching through assimilation. Very large number of reproductive tasks in the total number of activities in textbooks does not facilitate the development of formal skills. Also, the schematic nature of the tasks does not inspire students' interest in the performed activity.

A large number of algorithmic activities in the 1st grade textbooks is consequent upon the dominating type of contents – map and movement of the Earth. These tasks help to acquire basic geographic skills as regards finding objects in the terrain and on a map, calculating distances based on a map scale, reading and interpreting maps, etc. In many cases, in order to facilitate the acquisition of these skills by school students, authors incorporate examples of tasks in the main text, thus showing the line of thinking required when performing specific activities. Most of the task intended to be performed individually by students, contained in progress check sections highlighted by authors, repeat the tasks presented and solved as examples. They serve mainly to exercise simple skills and, therefore, do not facilitate the development of scientific thinking. Quite often, the tasks only check the ability to perform simple mathematic calculations (e.g. convert the representative fraction scale to verbal scale) without any reference to practical utilization of this skill. The authors should, therefore, introduce greater variety – in terms of level of difficulty – of algorithmic tasks, thus arousing interest in particularly able school students in the activities performed.

A modern geography textbook should facilitate the development of operative knowledge of a student. This means that the contents structure and the exercise included in a textbook should engage a student in performing various activities. Crucial here are problem-solving tasks, developing the ability to use scientific knowledge, to combine and select facts and to organise them in order to identify and solve a problem. They also help to develop the skill of drawing and formulating conclusions based on premises observed, and to give arguments for and evaluate the solution adopted. Unfortunately, there are not many activities of this kind in the analysed geography textbooks (figure 1).

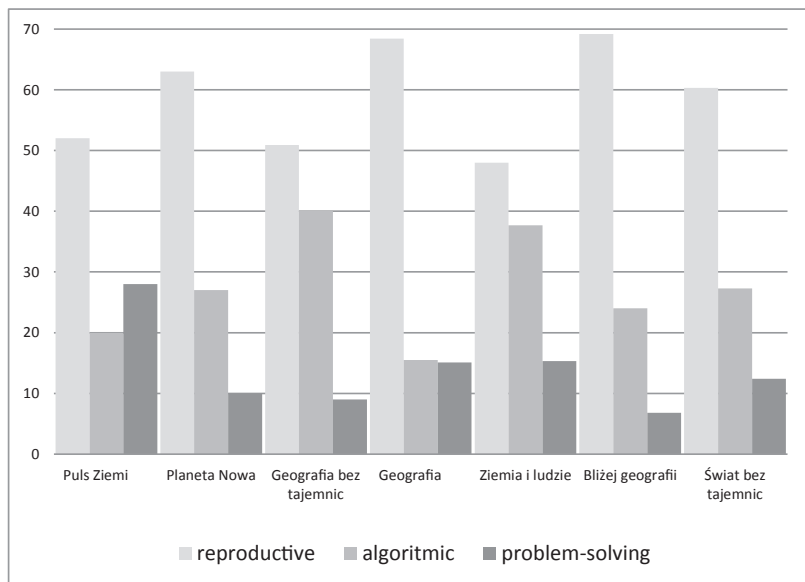


Fig. 1. Activities in 1st grade geography textbooks by type of cognitive activity (in %)

Source: Own study

The analysis of the types of tasks shows little creativity and invention of the authors. Most tasks are not particularly interesting, rather conventional, and serve only the purpose of teaching facts and numbers. There is also little connection between the contents of activities and the illustrative material in which the textbooks are very rich. The activities intended to develop key competences (most important skills) constitute a small portion of all tasks in textbooks for the 1st grade of lower secondary schools (figure 1). They focus on developing only two out of eight competences mentioned in the core curriculum for the 3rd level of education – the ability to search for, select and critically analyze information, and scientific thinking. Other skills are developed to a very limited extent.

Conclusions

The dominance of reproductive and algorithmic tasks in textbooks is a consequence of the approach adopted by authors of these textbooks to teaching geography in lower secondary schools. The predominance of didactic solutions preferring transmission of geographic knowledge, used by the authors in analysed textbooks, is – to some degree – consequent upon a small number of teaching hours of this subject in schools and a relatively broad scope of knowledge to be taught. This problem was raised by some specialists in geography didactics (Rodzoś et. al. 2008).

Geography teaching concepts observable in textbooks do not fully utilise the educational potential of geography as a school subject. The structure of the contents and the types of activities do not offer many opportunities for developing important

(from the educational perspective) skills included in the core curriculum. The dominance of illustrative material in the textbooks does not make them innovative, either as it has not been adequately utilised for teaching purposes. Attempts to introduce innovations in textbooks should, to a greater extent, focus on developing key competences mentioned in the core curriculum. Also tasks intended to facilitate knowledge acquisition require deeper reflection. It is a skill important for the modern world where the influx of information is rapid and scientific knowledge very quickly becomes outdated.

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