

CARTOGRAPHIC AIDS FOR OUTDOOR EDUCATION IN PRIMARY SCHOOLS IN THE CZECH REPUBLIC

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Abstract

In primary schools geography is the subject in which cartographic aids are most often used. However, they also have an irreplaceable role in various forms of outdoor education (field trips, outdoor exercises, school trips, open-air schools, etc.). This paper presents results obtained from interviews with teachers concerning the use of cartographic products. The survey was carried out in Brno and the sample consisted of 30 teachers, either from primary schools or from the lower levels of eight-year grammar schools (years 1–4). The first part of the interviews concerned the printed cartographic products (atlases, wall maps, basemaps, etc.) used in their particular school. The second part dealt with the use of internet maps in the school environment. The final part concerned the particular forms of learning during which cartographic aids are used.

Keywords: outdoor education, cartographic aids, primary schools in the South Moravian Region, interview with teachers

INTRODUCTION

Geography is a subject that should also include outdoor learning as an integral part of its curriculum. Depending on the goals and teaching methods employed, pupils should be able to make appropriate use of maps and other cartographic aids during outdoor education courses. This will help them to acquire the basic skills needed for the collection, processing, interpretation and evaluation of the information obtained. Outdoor education can take diverse organisational forms, such as walks, field trips, outdoor exercises, trips lasting several days and open-air schools. The teaching of geography and outdoor education in particular needs to reflect the actual work of professional geographers. Pupils and students can emulate such work in the outdoors in a similar way to experiments carried out in school in physics and chemistry. For instance, they can work with topographic and thematic maps, develop

the ability to find bearings on various types of maps with the help of an orienteering compass, draw topographic sketches, work with and handle GPS devices, and make practical use of maps and instruments for planning routes and movements in the outdoors. These activities should be part of everyday learning, both inside and outside conventional classroom settings.

The goal of this paper is to present the use of cartographic products in Czech primary schools (or the lower level, years 1–4, of eight-year grammar schools). An empirical method of structured interviews has been employed. The survey sample was taken from 30 primary schools/lower level of eight-year grammar schools in Brno. The first part of the interviews concerned the printed cartographic products (atlases, wall maps, basemaps, etc.) used in their particular school. The second part dealt with the use of internet maps in the school environment.

The final part concerned the particular forms of learning during which cartographic aids are used.

The planning of outdoor education must be based on compulsory curricular documents, and most importantly on the basic goals (indicators) of the thematic areas that concern outdoor education. That is especially the case in relation to the cartographic aids that pupils should be able to use after completing their compulsory education. At the present time there is no overview of the use of cartographic aids, either in school settings or, among other areas, in outdoor education. The paper will present the use of cartographic aids in school practice, thereby contributing to the discussion concerning which cartographic aids can be suitably incorporated into geography teaching, particularly in the area of outdoor education. The author proceeds on the basis of the findings from the interviews with teachers and in the conclusion she provides an overview of the most usable cartographic aids in outdoor education.

Outdoor education

Outdoor education, also referred to as outdoor learning or fieldwork (Biddulph et al. 2015; Kent et al. 1997; Oost et al. 2001; Rickinson et al. 2004) in literature written in English, is perceived as an integral part of the curriculum. It is primarily characterised by the fact that it takes place outside the conventional school classroom. The above-mentioned authors consider outdoor education to be an integral part of geography teaching. The authors Kent et al. (1997) cite the advantages of outdoor education as not only an efficient and pleasant form of learning, but in particular as a suitable tool for the integration of geographical theory and practice. The Dutch authors Oost et al. (2001) define outdoor education as 'the undertaking of educational activities in an outdoor setting related to a specific area of the curriculum. In Slovakia the efficiency of outdoor education has been researched in close detail by, for example, Kvasničák et al. (2005), who refer to it as outdoor experiential learning and class it as

informal learning. In Czech literature, Řezníčková (2008) points out inconsistencies in the definition of the term in connection with other similar terms such as learning in the landscape, learning in the outdoors, outdoor classes, outdoor exercise, excursion, educational walks and geographical laboratory, etc. For our purposes let us understand outdoor education as an umbrella term for diverse forms of learning whose common feature is that they take place outdoors, outside the school classroom, as defined by Hofmann et al. (2008). Hofmann et al. (2016) mainly highlight the formal and procedural aspects of outdoor learning and do not deal with the use of specific cartographic aids in detail. The efficiency of outdoor education in terms of its interconnection with classroom learning is discussed, for example, by Činčera and Holec (2016). In addition, Marada (2006) and Záleský (2009) refer to the benefits of outdoor education in their papers, but mainly focus on the process of planning and reinforcing its inclusion in curricular documents.

Outdoor education can be classified according to several different factors, most frequently those of time and space. In terms of time, outdoor education can be divided into short-term (one to three short lessons taking place in the immediate vicinity of the school, e.g. on the school grounds, which may feature Stevenson screens, marked local meridians, sandpits for relief modelling, arboreta, geoparks, etc.), medium-term (lessons which take up a whole day of instruction and which may involve, for example, thematic walks through the surroundings of the school, excursions to various industrial or agricultural establishments, museums, historical monuments, exhibitions, etc.), and long-term (lessons lasting two or more days, which may include school trips and open-air schools, as well as specialised forms of outdoor education focusing on natural science, social science, physical exercise or adaptation courses). In terms of space, we can differentiate between outdoor education in rural landscapes, in urban landscapes, in preserved natural landscapes (e.g. protected landscape areas) and in modified landscapes (e.g. disused quarries).

OBJECTIVES OF PRIMARY EDUCATION

The system of curricular documents has been in force in the Czech Republic since 2004 (Act 561/2004 Coll.), and at the national level it consists of the National Education Programme and Framework Educational Programmes (hereinafter referred to as FEPs), which define binding frameworks for individual stages of education. At the level of schools, it comprises the School Educational Programmes (hereinafter referred to as SEPs), based on which education takes place in individual schools.

The FEPs schedule outdoor education as early as the first stage (years 1–5) of primary school, mainly in the educational area ‘Humans and their World’, where the foundations of natural and social sciences are laid. Moreover, pupils become acquainted with out-of-school activities in physical education and health education. Significant time is also devoted to outdoor education in its long-term forms, such as open-air schools. For the second stage (years 6–9) of primary school and for grammar schools, outdoor education is grounded more firmly in the individual educational areas of FEPs. In the educational area ‘Humans and Society’, teachers may include visits to museum, castles, and chateaux as part of history lessons and they can conduct various surveys at the location of the school as part of civic education. One specific thematic unit that directly relates to outdoor education is grounded in FEPs in the educational area ‘Humans and Nature’. It is in the form of two subjects, natural science and geography (see below). Outdoor education can again be widely used as part of physical education (e.g. time spent in the open air, camping, summer and winter training courses, etc.) and health education.

Another curricular document is entitled Standards for Primary Education. These standards are clear and definite expected outputs of individual educational fields in FEPs, at the end of the first and second stages of primary education. They are comprised of indicators and illustrative tasks. The standards for primary education constitute the minimum target requirements for education. They

contain the methodical support intended for school practice. The educational field of geography at the second stage of primary school (years 6–9) in FEPs comprises 7 thematic circles in total. There are two thematic areas, Geographic Information, Data Sources, Cartography and Topography, and Outdoor Geography Lessons, Practice and Application that pervade the entire field of Geography, see Table 1.

CARTOGRAPHIC AIDS FOR THE OUTDOORS

By means of suitably chosen aids, geography (and other) teachers can make more efficient use of various teaching methods in order for their pupils to better achieve the set learning goals, considering their age and mental maturity and the conditions under which they pursue these goals. Nowadays, an inexhaustible number of teaching aids are available. The use of these aids mostly depends on the guidelines of the school but also on the level of each individual teacher’s activity.

The term teaching aid typically refers to objects and items that mediate or simulate reality and that provide greater illustration or facilitate learning (Průcha et al. 2003). Various classifications of teaching aids can be found in pedagogically and didactically oriented publications: Maňák and Švec (2003), Kalhous and Obst (2002) and Dostál (2008). The following categories of teaching aids are defined most frequently: real objects, models, depictions, sound, touch and literary aids or programmes. Teaching aids in geography are dealt with in more detail, for example, by Wahla (1973), who defines teaching aids as objects and materials that are used in the teaching process to convey new pieces of knowledge by which means one’s own knowledge, skills, and habits are formed, i.e. they serve as sources of information for the formation, deepening, and enrichment of ideas. Wahla (1973) classifies geographic aids in detail as follows: real geographic objects, models, instruments, pictures, sound aids, literary aids and programmes. The classification proposed below (figure 1) has been chosen with regard to the use of cartographic aids in outdoor education.

Table 1 Selected thematic Geography areas from the FEPs.

Source: Herink 2016, own processing.

Thematic Area	Geographic Information, Data Sources, Cartography and Topography.
Comments	In the introduction to geography studies at the second stage of primary school (year 6), pupils acquire the basics of <i>geographic cartography and topography</i> . The pupils learn to work efficiently with basic geographic information media and data sources. These include printed and electronic cartographic products, including aerial images and other remote sensing outputs, the internet, geographic information systems, GPS, etc. Pupils acquire knowledge, techniques, and skills for finding their bearings, moving, and surviving out of doors.
Expected FEP output for primary education: Z-9-1-01	<ol style="list-style-type: none"> 1. The pupil can identify geographic information. 2. The pupil can adequately evaluate and use appropriate geographic information contained in textbooks, school atlases, printed and electronic maps, and in other sources. 3. The pupil can express, in their own words, the required geographic information on selected locations or phenomena and processes.
Expected FEP output for primary education: Z-9-1-02	The pupil can use and comprehend basic geographic, topographic, and cartographic terminology.
Indicators	<ol style="list-style-type: none"> 1. The pupil can create simple personal mental schemes to find their bearings in the region. 2. The pupil can draw a mental map of popular or high-risk areas in a municipality and its environs, or a mental map with different contents. 3. The pupil can compare the mental map created with a map or plan of the same territory. 4. The pupil can use the mental map to evaluate objects, phenomena, and processes for spatial perception and for evaluating attitudes in the environment.
Thematic Area	Outdoor Geography Lessons, Practice, and Applications
Comments	Outdoor geography lessons, regular exercises, observations in the local landscape, and suitably planned geographical excursions should be applied in geography lessons on every suitable occasion, in every season of the year. The possibility to teach pupils directly in the outdoors is a great and unique asset of geographical practice.
Expected FEP output for primary education: Z-9-7-01	The pupil masters the basics of practical topography and orientation in the outdoors.
Indicators	<ol style="list-style-type: none"> 1. The pupil can orient themselves in the outdoors by means of landmarks (points, lines, surfaces) and maps. 2. The pupil can determine the cardinal directions by means of instruments. 3. The pupil can use a map and instruments for the planning of practical routes and movements in the outdoors.
Expected FEP output for primary education: Z-9-7-02	The pupil can apply practical methods during observation, representation, and evaluation of the landscape.
Indicators	<ol style="list-style-type: none"> 1. The pupil can distinguish objects, phenomena, and processes in the observed landscape. 2. The pupil can depict observed objects in a simple sketch, or in a printed or electronic map. 3. The pupil can determine changes in the landscape under observation based on a comparison of historical and current sources of information. 4. The pupil can place objects in the landscape into pre-determined categories (position, appearance, features, function). 5. The pupil can correctly use specialist geographical terminology when describing the landscape under observation.

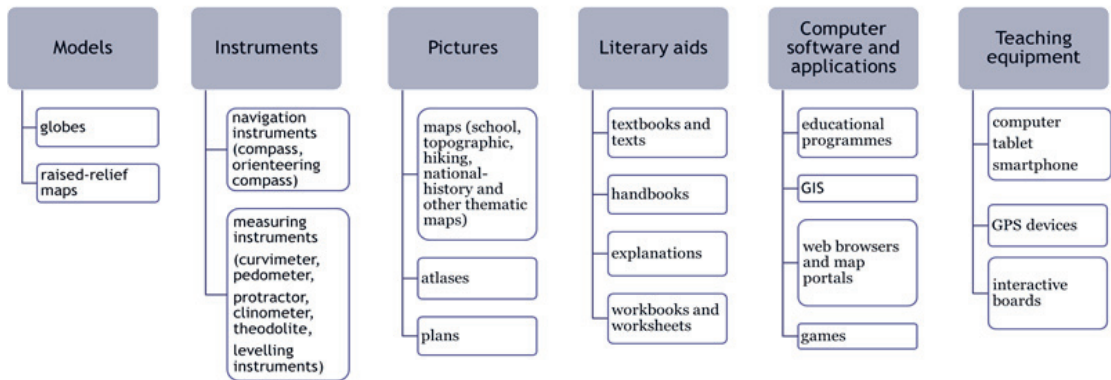


Figure 1 The classification of cartographic aids

Source: own processing.

RESEARCH INVESTIGATION

The research interviews took place in the spring of 2016. The goal of the investigation was to ascertain which cartographic aids are used in primary schools and at the lower level (years 1–4) of eight-year grammar schools in the Czech Republic, with the emphasis on their use outdoors. The data collection method employed was in the form of a semi-structured interview. The research sample consisted of 30 teachers, either from primary schools or from the lower level of grammar schools (see Table 2). The selected number of participants was based on the available sample of faculty schools of the Faculty of Education of Masaryk University in Brno. An interview was conducted with one teacher from each school. A total of 21 women and 9 men took part in the research. The average duration of the respondents' pedagogical experience was 12.5 years. The interviews were not anonymous, thereby ensuring the partial validity of the research and the possibility of verifying the accuracy of the results and the work of the interviewers. These interviewers were properly trained in how to conduct the interview and, if applicable, how to ask further supplementary questions. The interviews were structured into five areas: printed maps, web maps, other cartographic aids, and the use of aids in various forms of instruction. The last part of the interview dealt

with the respondents' personal data (duration of teaching experience, subjects taught, further comments and suggestions, etc.).

Atlases Used in Instruction

Most respondents (27) use the atlas 'Česká republika – školní atlas' (Czech Republic – School Atlas) from the publishing house Kartografie Prague when teaching. The year of publication of the atlases (or reprints) varies, with the year 2013 occurring most frequently (5 respondents), but the use of older editions (1998, 2003, 2005, 2007) also occurs. Four respondents stated that they make use of a paperback edition of an atlas published by Kartografie Prague, but it is not specified whether it is a paperback edition of an atlas from the Czech Republic or from other countries or continents. Only one respondent used 'Školní atlas Česká republika + Evropa' (School Atlas of the Czech Republic + Europe) from the company SHOCart. The second most frequently used atlas (25 respondents) is 'Školní atlas světa' (School World Atlas), again from Kartografie Prague. The last atlas mentioned was 'Školní atlas dnešního světa' (School Atlas of Today's World), the 2011 edition from the company TERRA-KLUB, which is used by six interviewees. The item "Other" covers atlases or maps used that were not specified.

Table 2 A brief characteristics of the research sample

Source: field survey; own processing.

Teacher code	Sex	Duration of pedagogical experience	Specialisation in subjects	Teacher code	Sex	Duration of pedagogical experience	Specialisation in subjects
1	female	4	Geo, PE	16	female	8	Bi, Geo, Che
2	female	27	Geo, NS	17	male	3	Geo
3	female	1	Geo, PE, Eng	18	male	18	NS, PE, Ma
4	female	23	Geo, 1 st stage, Ma	19	female	0.1	Rus, His, Geo
5	male	30	Geo, Ma, PE	20	female	15	Ger, NS
6	female	3	Geo, His	21	male	28	IS, NS, Geo
7	female	30	IS, NS, Geo	22	female	1	1 st stage, Envir
8	male	10	NS, PE, Ma	23	male	9	Phy
9	female	8	Geo, Eng	24	female	25	Geo, NS
10	female	6	Geo, NS	25	female	13	Geo, Eng
11	female	7	Geo, NS, PE, Ma	26	female	1	Geo, 1 st stage
12	female	x	Geo, PE	27	female	10	Geo, NS
13	female	26	Geo, Ger	28	female	14	Geo, PE
14	male	11	Geo, PE, Eng	29	male	14	Geo, His
15	male	17	Geo, NS	30	female	0.5	Geo, NS, PE

Note: Teachers from primary schools or lower grammar schools (years 1–4 of eight-year grammar schools) in the South Moravian Region

Legend: Geo – Geography; PE – Physical education; NS – Natural science; Eng – English; Ma – Mathematics; His – History; IS – Information science; Ger – German; Bi – Biology; Che – Chemistry; Rus – Russian; Envir – Environmental education; 1st stage – first stage in primary schools (years 1–5); Phy – Physics

Wall Maps Used in Instruction

The teachers mainly make use of wall maps of the Czech Republic, the world and the continents. These include general geographical, political, or other thematic maps. 13 respondents stated that they use wall maps from Kartografie Prague, 11 respondents use wall maps from STIEFEL EURO-CART, 4 respondents use maps from the publishing house Komenium Prague, and 1 respondent uses Publicom maps. A total of 13 respondents did not specify any publishing house. The year of

publication was not ascertainable from the interview, but maps with an older date of publication were frequently mentioned.

Other Printed Map Products

When teaching geography, in addition to school atlases teachers use hiking maps most often (23 respondents). In their teaching, four respondents also make use of printed maps from the Czech Office for Surveying, Mapping and Cadastre, with scales of 1:10,000; 1:25,000; and others. The

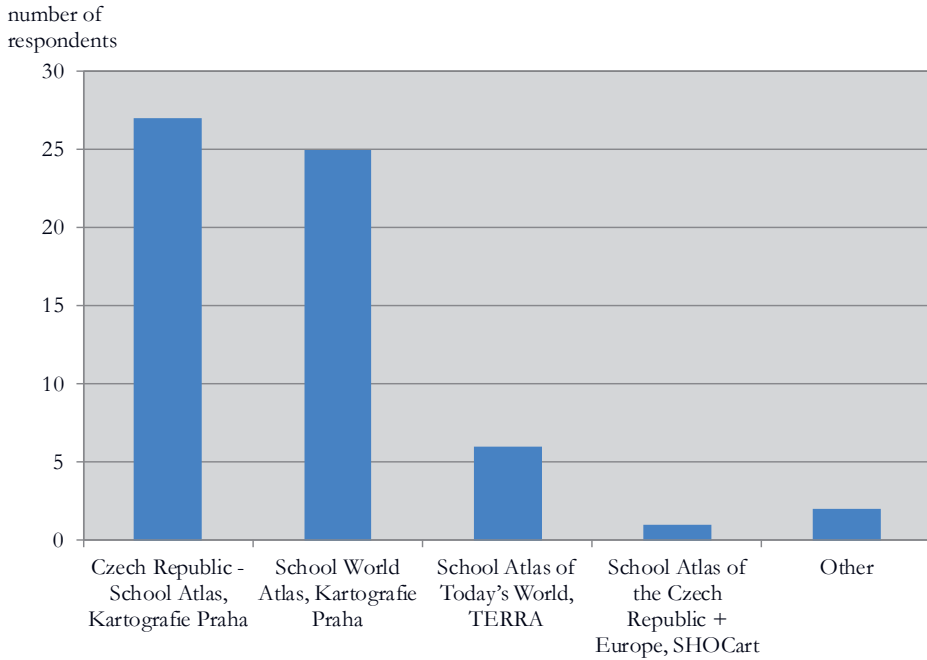


Figure 2 Atlases used in geography teaching in primary schools
 Source: field survey; own processing.

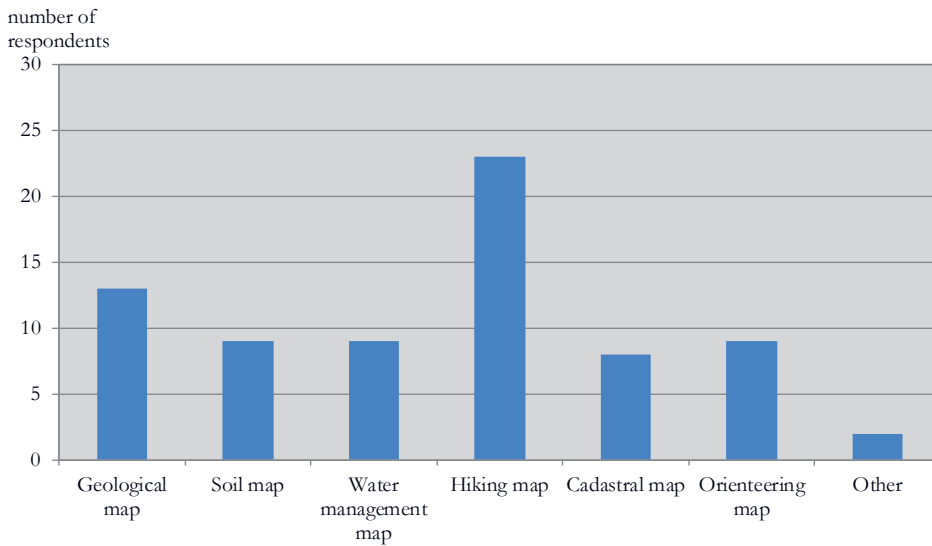


Figure 3 Use of printed thematic maps in geography teaching in primary schools
 Source: field survey; own processing.

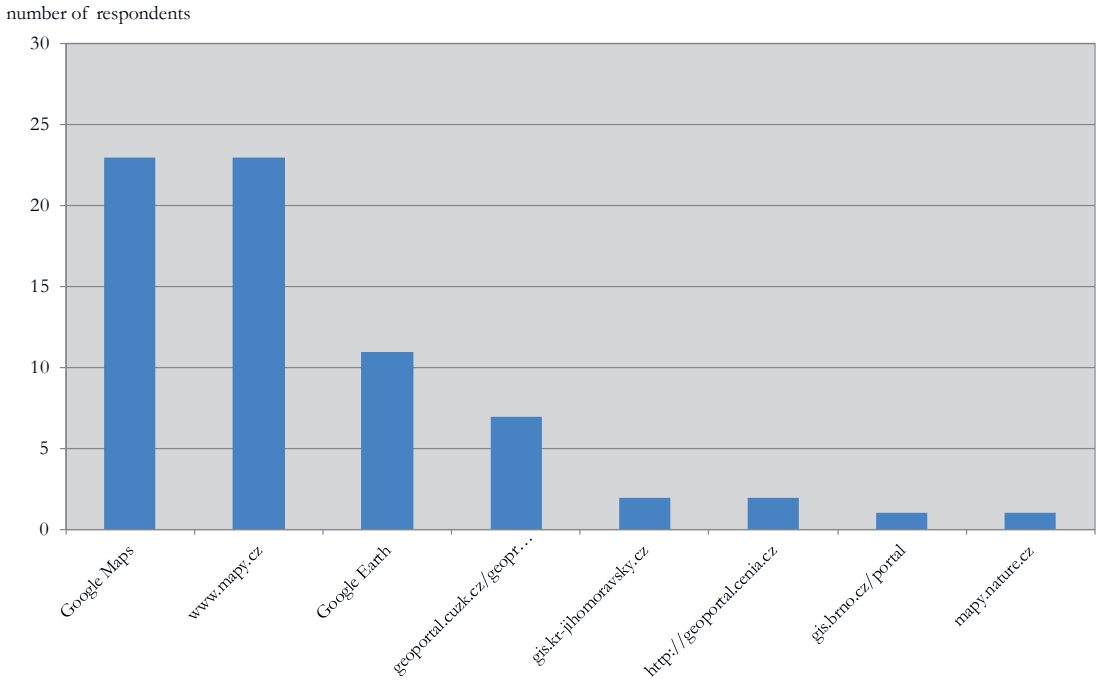


Figure 4 Map sources on the internet used in geography teaching in primary schools
Sources: field survey; own processing.

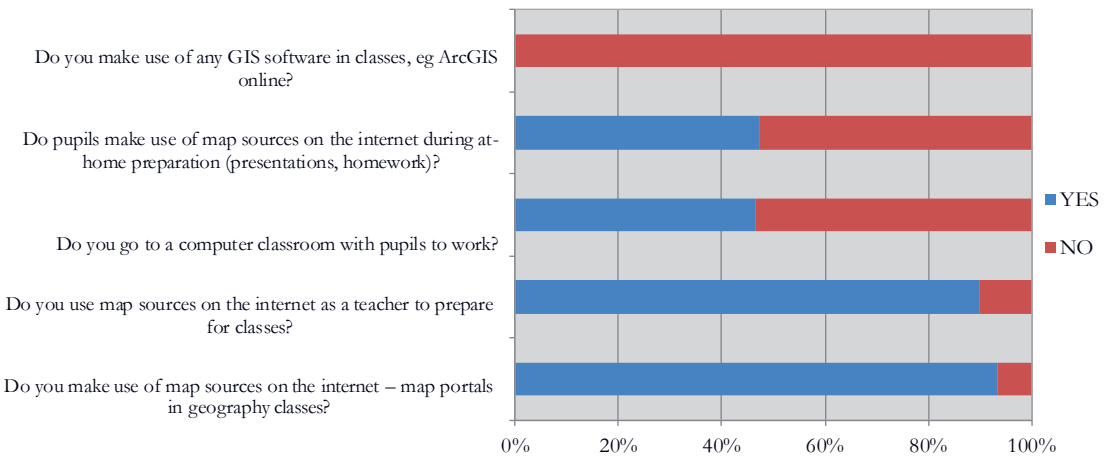


Figure 5 Use of a computer, map sources on the internet and GIS software in geography teaching in primary schools
Sources: field survey; own processing.

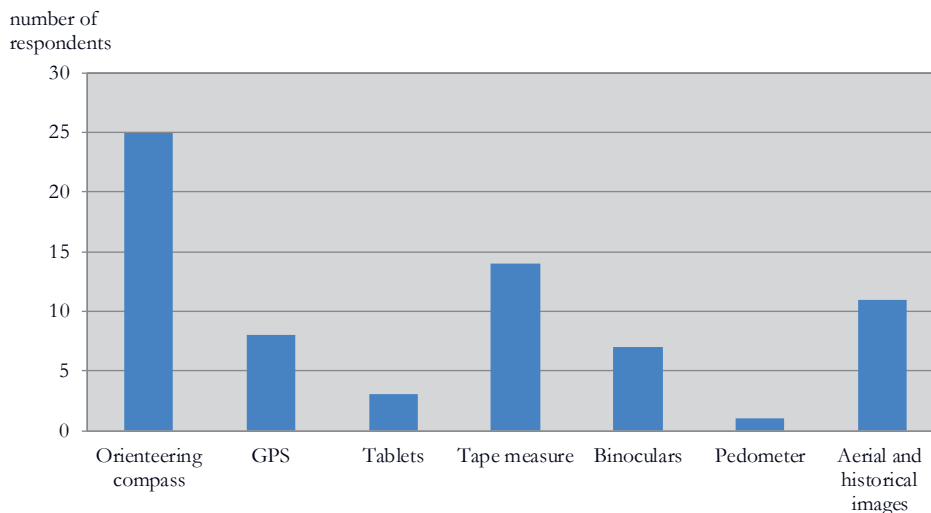


Figure 6 Cartographic aids available in schools under study

Sources: field survey; own processing.

respondents stated that they utilised the hiking and basic maps for tasks related to comparisons of maps of different scales, measurements in maps, explanations on issues concerning contour lines, work with map keysaps for instruction. However, some thematic maps (geological, soil, and water management maps) used are only from world atlases and an atlas of the Czech Republic. Under the item “Other”, 2 respondents specify using a map of a municipality.

Map Sources on the Internet

Another part of the interview dealt with the use of computers, particularly map sources on the internet or GIS software during instruction or, if applicable, during at-home preparation by the teachers or pupils. 28 of the interviewed teachers use internet map sources as part of their instruction, and only 2 respondents stated that they did not use such aids for teaching. Most frequent use is made of Mapy.cz and Google Maps (23 respondents each), then Google Earth (11 teachers), the Geoportal of the Czech Office for Surveying, Mapping and Cadastre (7 teachers) and, to a lesser extent, the Map Portal of the South Moravian Region and the INSPIRE National Geoportal. The Brno Map Portal and the

Map Portal of the **Nature Conservation Agency** of the Czech Republic occurred in a single case.

90% of the teachers in the survey sample use map sources from the internet to prepare for instruction. In three cases, the respondents added that they did so only to a minimal extent. 47% of the respondents use a computer classroom to work with their pupils. 9 respondents (30%) stated that they visited a computer classroom with their class only to a minimal extent; 3 respondents added that they only visited a computer classroom with pupils in the higher years. 63% of pupils make use of map sources for homework. All the respondents stated that they do not use GIS software in their classes.

Availability of Cartographic Aids in Schools

In addition to the afore-mentioned maps and atlases, orienteering compasses are the most frequently available and widely used aid in schools. 25 of the teachers interviewed said they are available at their school. The number of compasses was specified by 56% of the interviewees and ranged from 5 to 30. Schools appear to have an average of 15 orienteering compasses available. From the

interviews it was found that the teachers use orienteering compasses for map orientation, and in determining the cardinal directions and azimuths. They mainly undertake these activities during field-work, in open-air schools, on geographic walks, on sports courses or on civil defence days. The second most available aid is a tape measure (14 respondents), of which teachers have access to a maximum of 3. Tape measures are used in geography courses for measuring distances, although teachers additionally specify that tape measures tend to be used more often in physical education. 27% of the respondents have access to GPS devices. The respondents indicated that 3 more schools make use of GPS on mobiles or tablets owned by pupils, and one school uses tablets with integrated GPS. When specifying the number of devices, the respondents state that there are no more than 3 GPS devices per school, and that they are used primarily during outdoor learning or in open-air schools.

Three of the schools in the sample own tablets, with 10, 15, and 20 devices available respectively. It is not specified whether and how the tablets are used in geography. Binoculars are owned by 7 of the schools from the survey sample and they are used, for example, to observe the landscape.

A total of 37% of the schools included in the interview make use of aerial and historical images of territory. It follows from specific details given that the internet is the source of these images and the respondents only use the images in digital form when comparing changes in the landscape.

Use of Cartographic Aids in Various Forms of Outdoor Learning

The fourth part of the interviews concentrated on the use of cartographic aids in various forms of outdoor learning. Of the thirty respondents, 23 make use of cartographic aids during outdoor education. The following numbers are determined only from those respondents who indicated that they do use aids in outdoor education. All users of cartographic aids were able to list multiple forms of outdoor learning. The most frequent form of

instruction using these aids proved to be school trips (16 respondents), followed by schools in nature (6 respondents), project learning (5 respondents), and excursions (5 respondents), while 3 respondents stated that they used aids during practical geography exercises (teaching of topography, geographic walks and practical exercises for orientation). Civil defence days, sports courses, orienteering, and hiking groups were mentioned in single cases.

The orienteering compass is the most frequently used aid in the outdoors (19 respondents), and the second most frequently used is the hiking map (16 respondents). GPS devices (including hiking GPS devices and GPS in mobile devices), with 8 teachers, are used to a lesser extent in the outdoors. Topographic maps are used outdoors by 5 interviewees and city plans by 4 of them. Binoculars are used by 4 respondents. In addition, tablets, orienteering maps, pedometers, and tape measures are used in individual cases.

DISCUSSION OF THE RESULTS

The field research has demonstrated the utilisation of cartographic aids in both ordinary instruction in the classroom and in outdoor education. However, the field research did not address the issues of how often such aids are used in instruction, during which particular tasks, etc. It would be desirable to follow up this study with further research. The results prove that maps/atlas are the principal cartographic aids in geography. They should be used for work in every lesson, during at-home preparation, and in outdoor education.

Bláha et al. (2015), for example, discuss the use of cartographic aids and their users, but also the requirements imposed on these cartographic products. They state that the production of teaching aids for schools requires attention because, among other things, work with visual elements, particularly maps, represents one of the key geographical skills. The authors say that school atlases and wall maps are traditional aids still in use despite the arrival of electronic media. Naturally, in the future schools will make use of such digital forms of maps in instruction. In addition to digitisation however, one aspect

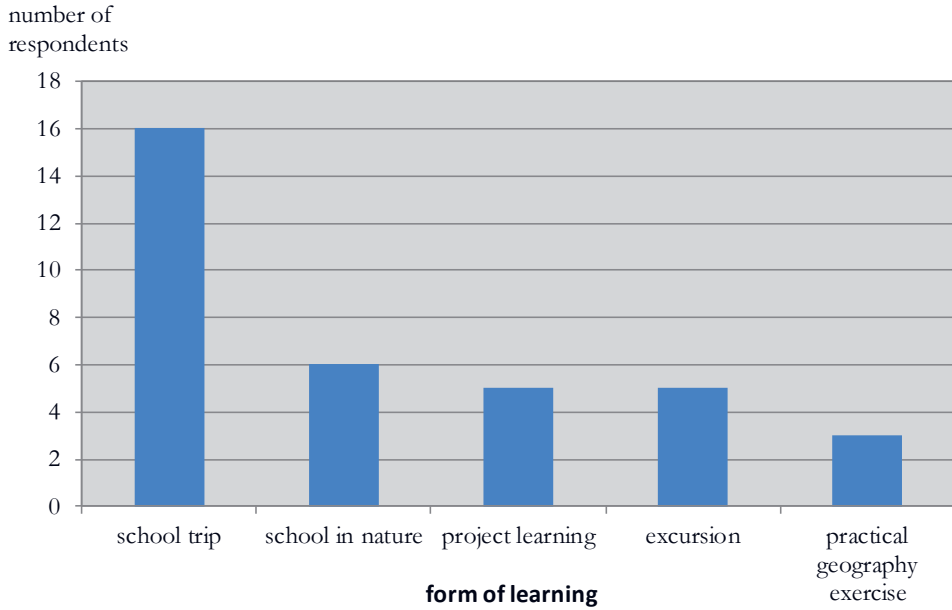


Figure 7 Forms of outdoor education with the use of cartographic aids identified in schools under study
Sources: field survey; own processing.

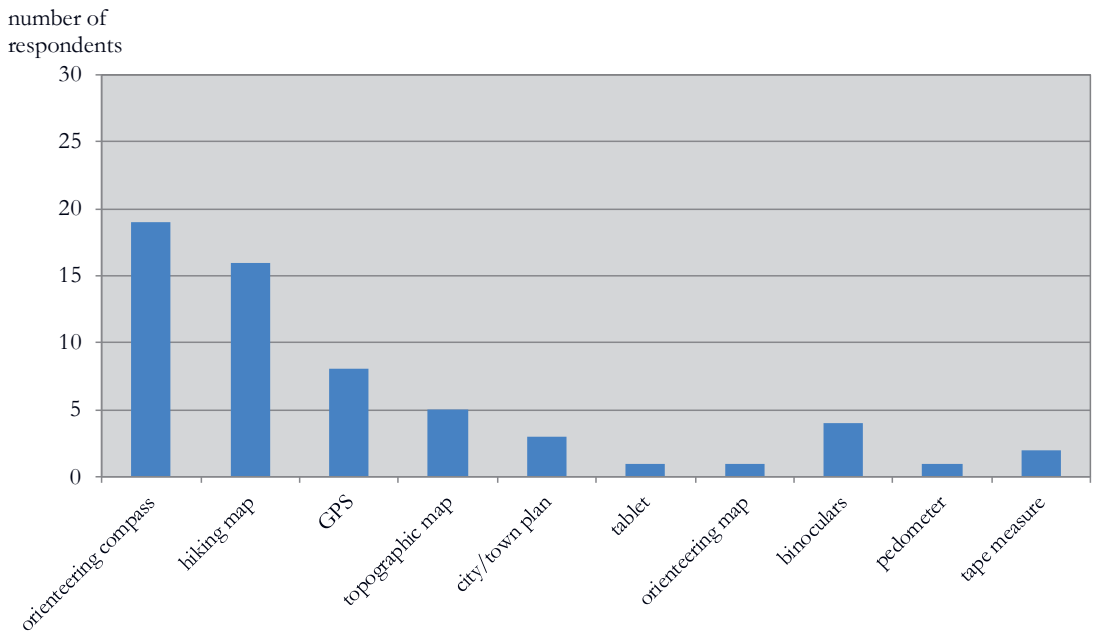


Figure 8 Cartographic aids used in outdoor education
Sources: field survey; own processing.

of even greater importance is that geography teaching should significantly concentrate on the versatile use of the cartographic sources available on the internet (through web browsers, tablets, GPS navigation devices, etc.).

Zmrzlík (2008) deals with the use of cartographic tools, not only in instruction, but also in the ordinary life of every individual. The author points out that the development of computer cartography and the opportunity to use both sophisticated and simple map creation programs have led to a large quantity of cartographic products being made by non-experts, and by graphic design and advertising agencies. However, the creators of such maps do not follow the general rules and principles in their creations so their maps are generally unsuitable for users and, by extension, for teachers and their pupils. Thus, it should be within teachers' professional skill-sets to navigate among the overwhelming number of cartographic products on offer and to choose professional, accurate and high-quality cartographic products for use in school settings.

CONCLUSION

Outdoor education incorporated into geography teaching represents an efficient way of learning, as it increases motivation and interest in the field, enabling pupils to directly observe a number of processes and their impacts. A range of geographical and, by extension, cartographic and other skills, can be fostered through such learning. Outdoor education cannot operate without cartographic aids. The following are among the principal cartographic aids that can be used in outdoor education.

Paper Maps

Paper maps have an irreplaceable position in outdoor education. Pupils can hold them in their hands and continue to work with them. They can be used not only to find one's bearings in the landscape, to conduct measurements in the landscape and to learn about the basic characteristics of an area, but also to plot certain thematic problems. For example, basic topographic maps can be used to discuss landscape utilisation. When teaching about a local region,

teachers often find it difficult to obtain thematic maps for a specific territory (e.g. the surroundings of the school) in printed form. Therefore, it is most appropriate to use map portals as a source of such information and to print the desired topics for the area of interest.

- a) Basic maps of the Czech Republic – these are sets of maps in various scale sets published by the Czech Office for Surveying, Mapping and Cadastre and can be purchased via the Geoportal of the Office (<http://geoportal.cuzk.cz>). Maps can be printed in a series of various scales starting from 1:1,000. For outdoor learning, we recommend scale sets of 1:10,000 or 1:25,000 and using black-and-white photocopies for plotting.
- b) Hiking maps – are thematic maps that contain objects, phenomena and their characteristics that are important for hiking/tourism. These maps are most often published at a scale of 1:50,000 and have uniform content and form, always depending on the particular publisher. In addition to maps intended primarily for hiking, it is also possible to purchase specialised maps for cyclists (with the profiles of selected cycling routes) and for boaters.
- c) Orienteering maps – detailed maps (most often at a scale of 1:10,000 or greater) with a specific map key are an indispensable aid in orienteering and can be utilised in various forms of outdoor education.

Digital Maps

Further aids that can be used in outdoor education include geographic information systems (GIS) and outputs created by these. These include various map portals. The list of digital map sources that can be utilised during all stages of outdoor education is very extensive.

- a) Commercial map portals – commercial map servers available through search portals are one of the best-known and most used digital map sources. These map servers display the entire territory of the Czech Republic and make it possible to use aerial/satellite images and

various types of maps (e.g. winter maps, geographic maps, 3D maps, etc.). Servers oriented towards bicycle touring (hiking/tourism) can also be used in outdoor education.

- b) Public-administration portals – further sources for maps can be found on portals whose main purpose is to provide information on the relationship between citizens and public administration, so-called public-administration portals. These map portals are run by individual ministries or state institutions. On the portals, it is possible to find a great deal of valuable information, statistical data and, in particular, maps relating to specialised subjects, including administrative divisions, flood and land use plans, nature conservation, hydrological characteristics and more. Thus it is possible to display not only socioeconomic characteristics of areas on these map portals, but also specific natural constituents and their aspects.
- c) Portals of regional authorities and map portals of individual municipalities (if a given municipality has a map portal at its disposal) – come at various qualitative levels. These portals do not show the entire territory of the Czech Republic, but focus on particular areas and contain additional tangible and specific data concerning the given area. Examples for the city of Brno include the map portal of the South Moravian Region (<http://gis.kr-jihomoravsky.cz>) and the Brno map portal (<https://gis.brno.cz/portal>).

Mobile Technology

The development of mobile technology, in the form of phones and tablets, has provided the means for improving fieldwork; in part because they are generally affordable to most pupils. Modern technology is of great benefit to fieldwork in terms of data collection and processing. Although until recently the only available technology was single-purpose GPS (Global Positioning System) devices, current applications can handle much more. All modern mobile devices have a video camera, a still camera and, through a broad range of applications, the ability to obtain information from online or network sources. Mobile devices and available software applications can be used in the final stage of outdoor learning

when working with data and facilitating their efficient presentation and analysis.

The methodical use of individual cartographic aids in particular learning assignments is the task of the teachers and the subject matter of the research of experts – didacticians. At present, the issue of insufficient material supplies at schools is taking a back seat: the use of cartographic aids in instruction depends more on the willingness and energy of particular teachers, as well as their professional qualifications and their pedagogical skills.

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Résumé

Kartografické pomůcky pro terénní výuku na základních školách v České republice

Zeměpis je vyučovací předmět, jehož nedílnou součástí je výuka v terénu. V závislosti na cílech a použitých výukových metodách by žáci měli při výuce v terénu vhodně využívat mapy a další kartografické pomůcky, které jim mohou pomoci získat základní dovednosti týkající se sběru, zpracování, interpretace či hodnocení v terénu získaných informací. Při plánování výuky v terénu je třeba opřít se o povinné kurikulární dokumenty. Na státní úrovni se jedná

o tzv. Rámcové vzdělávacími programy (dále jen RVP), které vymezují závazné rámce pro jednotlivé etapy vzdělávání. Konkrétní tematické celek, který se vztahuje přímo k terénní výuce je ukotven v RVP ve vzdělávací oblasti „Člověk a příroda“, a to u dvou předmětů: přírodopisu a zeměpisu. Široké uplatnění může najít terénní výuka také v rámci tělesné výchovy (např. pobyt v přírodě, táboření, letní a zimní výcvikové kurzy apod.) a výchovy ke zdraví. Cílem první části příspěvku je představit ukotvení terénní výuky v kurikulárních dokumentech. Tyto kurikulární dokumenty nám však nedávají návod na to, jakým způsobem využívat např. kartografické pomůcky pro dosažení cílů a očekávaných výstupů v těchto kurikulárních dokumentech deklarovaných. Tato činnost je pak těžištěm práce učitelů.

Druhá část příspěvku tak představuje výzkumnou sondu do práce učitelů, zaměřující se na využití kartografických produktů v českých základních školách (nižších gymnáziích). Byla využita empirická metoda strukturovaného interview. Zkoumaný vzorek tvořilo 30 brněnských základních škol a nižších gymnázií. První část rozhovoru se týkala tištěných kartografických produktů (atlasy, nástěnné mapy, základní mapy a další) používaných na dané škole, další část se věnovala používání map na internetu ve školním prostředí a závěrečná část pak zjišťovala, při jakých konkrétních výukových formách jsou kartografické pomůcky ve školách využívány.

Výzkumná sonda prokázala využití kartografických pomůcek jak při běžné výuce ve třídě, tak při terénní výuce. Sonda však neřešila otázku, jak často jsou tyto pomůcky ve výuce využívány, při jakých konkrétních úlohách jsou využívány apod. Výsledky dokazují, že v zeměpise je stěžejní kartografickou pomůckou mapa, resp. atlas. Pracovat by se s nimi mělo při každé vyučovací hodině, při domácí přípravě a shodně tak i při terénní výuce. Metodické využití jednotlivých kartografických pomůcek v konkrétních učebních úlohách je úkolem učitelů a předmětem výzkumu odborníků – didaktiků. Otázka nedostatečného materiálního zabezpečení školy již v dnešní době ustupuje do pozadí. Využívání kartografických pomůcek ve výuce závisí spíše na vůli a aktivitě konkrétního učitele, na jeho odborné kvalifikaci a pedagogických schopnostech.

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