

BLENDING OF OLD AND NEW APPROACHES IN GEOGRAPHICAL EDUCATION: A CASE STUDY

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Abstract

Field work often takes place in the countryside and the city environment is neglected, although we usually move there more often. Natural science education should, however, include not only the evaluation of the rural landscape, but also the city, because we can find there an explanation for a number of physical-geographical but also socioeconomic phenomena and their spatio-temporal evolution. Therefore, the authors focused on the goal to use urban landscape as a "geography textbook". Urban landscape serves in this case as a didactic image.

A study about significant viewpoints in Brno and its surroundings served as a basis for the experiment in which pupils and students had to sketch a view from these viewpoints and authors evaluated how they are able to perceive the urban landscape, locate the significant elements in an urban structure, identify their functions and relations among them. This concept can be understood as a use of nonverbal elements in teaching. The results of this experiment and namely the comparison of sketches produced by pupils and university students are described in the paper which also describes the blending of old and new approaches in geographical education.

Key words: didactic image, geographical education, panoramic sketch, urban landscape.

Introduction

The enemy number one of teaching at all types of schools in the Czech Republic is neither the absence of theoretical material for teaching nor the lack of modern teaching resources. The will is often missing to employ activation methods (such as discussion methods, situational methods, role plays, mental mapping etc.) and techniques, which do not provide an instantaneous positive result especially because they do not present facts and the real state of affairs but develop creativity and namely thinking in pupils and students instead. The year 2012 became experimental for the authors of this research as they were to test one of many techniques leading to recognition and comprehension of studied reality through field work in the urban landscape.

A statement could be made that field training in the Czech Republic is connected largely with the rural landscape and the urban landscape is neglected in spite of the fact that a lot of people (including students) move in it more frequently. Literacy in natural sciences should however include the valuation of not only the rural landscape but also the urban landscape since in the latter one it can be found the explanation of a number of physical-geographical as well as socio-economic phenomena and their evolution in time and space.

Since the geographical phenomena change very rapidly in the urban environment, there is a range of best practice examples for teaching in the on-line environment that can be operatively adapted to actual development – see fieldworks from London (The Geography Teaching Today, Geography fieldwork – for GCSE and AS/A2, on-line) or Barcelona (Barcelona Field Studies Centre, on-line). Examples from abroad can be found however also in literature – Walcott (1999) commented upon the urban fieldwork as follows: „urban field-work enriches students’

geographic education in ways impossible to reconstruct in the classroom“. She also claims that „geographic literature lacks good examples from human geography of how this might be accomplished“. As it is possible to identify with the statement, the main goal is to employ the urban landscape as a “geography textbook” and thus to contribute to develop another fieldwork example. The urban landscape too offers a possibility to analyze geographical phenomena from the physical-geographical ones (landscape structure, soils, biota, climate...) up to the socio-economic ones (e.g. localization of industrial enterprises, public and commercial services, traffic nodes etc.).

In the Czech Republic, teaching methods and forms are not strictly prescribed. The system of curriculum documents for the education of pupils aged 3–19 years is defined by Act No. 561/2004 Coll., on preschool, basic and lower secondary, secondary, advanced vocational and other education (Education Act). The curriculum documents are produced at two levels – national and school. The national level is represented by the National Education Programme and the Framework Educational Programme (FEP) where the FEP specifies binding frameworks for individual stages of education. The school level is represented by school educational programmes (SEP) prepared by individual schools themselves and used as teaching models at these schools (Framework educational programme for basic education, 2004, 1). Thus, basic and secondary school teachers in the Czech Republic have to face a challenge of being the only ones responsible for the concrete and final form of the teaching programme.

Teaching of geography typically includes fieldwork, which can be defined for the purposes of this paper as „a complex form of teaching which implies progressive teaching methods (experiment, laboratory work, short-term and long-term observations, statistical surveys, questionnaire surveys, project methods, cooperative methods, methods of impression pedagogy...) and various organizational forms of teaching (outing, field exercise, excursion, thematic school trips – expeditions...). This form of instruction dwells on work in the field – namely outside the school.“ (Hofmann, E. et al. 2003, 6).

Methodology of Research

General Background of Research

Fieldwork has a long tradition at the Department of Geography (Faculty of Education, Masaryk University in Brno) and the curricula include eight forms of long-term fieldwork. In the last 20 years, the work was developing also in the landscape outside the town where the attention was given namely to the development of rural landscape in the model area of municipality Jedovnice (e.g. Hofmann 1996, Hofmann et al. 2003). Students at the Faculty learn how to work with pupils of basic schools or secondary school students in this area. The approach to the cognition of this landscape is interdisciplinary. As a matter of course, the socio-economic phenomena occur within this space too but at a much lower rate than in the towns. The disadvantage is well-known to the authors who therefore brought to life an idea of using the urban landscape of Brno city for teaching geography. Although the initiative is not at all new, it was neglected in the recent years.

In a broad context, the point is what techniques the students are capable to adopt in the collection of primary data and their further processing while using older methods and modern technologies. By older methods (in other words standard methods that could sometimes be less effective, such as frontal teaching) it is understood especially the capacity of producing a panoramic sketch, finding the own position by means of map and compass, determining the directions of facing axes and run field diary records. Further data are also acquired by using advanced technologies such as panoramic images of chosen facing axes or GPS positioning. These new technologies can be subsequently used at processing the acquired materials. Many

activities can be linked to the geographic or environmental project developing complex of skills by working with classical and modern technologies – map sketches, using GIS for mapping, the use of aerial or satellite images (Foltýnová & Svatoňová, 2008, Knecht & Svatoňová 2008). Old and new techniques of data acquisition overlap and complement each other. If the students gain enough experience from working with the traditional techniques, they will be capable to eliminate errors possibly occurring at work with new techniques by means of new technologies. The errors may occur for example at work with GPS in a shaded terrain or by erroneous handling of instruments. On the other hand, by using IC technologies can be reached better quality of presented results – e.g. maps (Martin In: Balderstoune 2006, 106).

Instruments and Procedures

In accordance with the above text, the main research purpose is to verify if the panoramic sketch is the appropriate activation method for pupils and students, how they react on it, what the differences among their sketches are and how the standard and modern techniques of teaching could be blended.

In 2012, urban landscape lessons were passed by 40 pupils from the 7th grade of basic school, 4 participants of the World Olympiad in Geography and more than 100 students of pre-service geography teachers for basic and lower secondary school education.

Urban landscape was learned by using a number of techniques from the processing of a panoramic sketch of the selected map section through taking photographs of the chosen area, using GPS for its localization and processing of the activity in the form of a PowerPoint presentation.

The technique chosen for introducing the Brno landscape is well-known but used only very seldom with pupils and students – it was a basic reconnaissance of the viewed territory based on defined facing axes into the form of a panoramic sketch. Three view points were specified for the purpose of preparing the panoramic sketches in the town of Brno where the pupils and students normally move around – the Myslivna view point in the south-western part of Brno, the edge of the former Hády limestone quarry situated in the north-eastern part of the town, and the pilberk castle localized in the town centre and lying nearly on the connecting line of the previously mentioned two points (see Figure 1). Background material was a study on “Brno views” from 1995 about points in the town of Brno and its surroundings from which interesting or impressive views of Brno can be experienced, prepared for the Department of Chief Architect by the Czech Union for Nature Conservation in Brno. The study presented a total of 29 observation points providing a very good view of Brno and may serve as a background material for activities in various parts of the town.



Figure 1: Localization of selected observation points in the town of Brno (source: google.maps.com, adjusted by authors).

Field work with pupils of basic schools was similar as that with university students – from a given observation point they were to plot landscape dominants in horizontal section, then lines and surfaces, and try to identify them with the help of the teacher. The way of plotting was arbitrary and depending on pupil's/student's skills.

The following step consisted of taking photographs from the given view point, focusing position and altitude by means of GPS and evaluating the view point. The results of the fieldwork were processed into a PowerPoint presentation.

Results of Research

Creative Expression in Geography Teaching

The function of creative expression in geography teaching has been studied by methodologists of this subject since the end of the 19th century. One of the most comprehensive sketchbooks for geography was created by M. Papík (1959) and school geography worked with its various forms and issues solid twenty years in the second half of the last century. The result was the creation of simplified contours of individual continents, countries, relief forms or creation of simple schemes.

Panoramic sketches were used mainly in the army. Teaching at schools they entered through the subjects of military training and geography. Outside the school, the technique was used by tourist clubs and scouts for creating marching routes, sketch maps, topographical sketches and recording of objects. It can be summarized that various types of sketches are used as well-established techniques which serve for recording present time data not only in the school practice. Thus, the created "didactic images" have become one of the most important groups of teaching aids. They contribute to visualization in the teaching process by demonstrating phenomena that could otherwise be observed with difficulties because of being for example too small or too big. Panoramic sketches are also employed to mediate phenomena which cannot be experienced immediately in teaching (Janík, Maňák & Knecht, 2009 In: Janko 2012, 26). According to Tollingerová (1976, 226), image as a means of illustration is important also because it represents a key carrier of didactic information helping the pupil to actively grasp and learn, thus being a support for him on his route to learn the substance of phenomena.

Their significance issues from the fact which is confirmed in Figure 2 and illustrates experimental research of human being in a natural situation (Geschwinder, Růžička & Růžičková, 1995, 7).

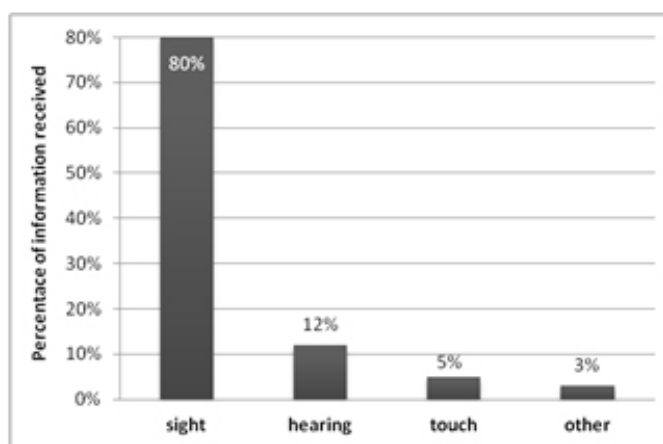


Figure 2: Experimentally obtained proportion of sensory receptors when receiving information (source: Geschwinder, Růžička & Růžičková, 1995, 7).

Psychology of the function of creative expression in geography teaching is dealt with also by Směja-Lončar (1987) in his contribution for the district pedagogical centre in Frýdek-Místek. In his study he comments upon individual aspects of human memory: „Though individual aspects of human memory cannot be isolated, we still can speak about predominating features of this or that memory performance. Logical memory is mentioned where internal semantic connections predominate in mastering the material; mechanical memory is mentioned if concepts and notions are preserved primarily through the law of repetition (see conditioned reflexes). Visual memory works with sensorial images and their supporting pier is first of all the emotional impression. We believe that this last type of the memory process is nearest to the child; it is however common in the adult person... Pros and cons of the approach, which counts on the mentioned memory qualities, can be perhaps demonstrated best on teaching geography.“ (Směja-Lončar, 1987).

As to techniques of picturing a near landscape, it is necessary to find an elevated place such as a terrain form or a form produced by man such as a city hall or church tower, high-rise building etc. In the case applied on viewpoints in Brno, the students or pupils would create a didactic image in the form of panoramic sketch of a certain urban landscape section. They learn on an actual case how to illustrate selected phenomena in the space that could not be observed from the classroom or identified from other places. In this way they get into a direct interaction with the environment and try to search relations between them historical (when and why the observed objects came into existence) or contemporary (object function, links to other objects such as traffic connections etc.). In this manner they in fact unconsciously form for themselves an idea about the spatial distribution of phenomena in the landscape – both natural and man-made – as well as about their mutual interaction. Repeated observation and recording can be used for monitoring the development in time. The panoramic sketch is then combined with a photograph of the same landscape section.

While during the school lessons the pupils learn how to systematically comprehend a verbal communication, they hardly learn how to understand non-verbal information (Mare 2001, 494–495). It is assumed that non-verbal elements – among which can be included a landscape view – speak for themselves and certain visualization is expected as a matter of course. However, not always the pupils can grasp them correctly and explain them. This is why the use of non-verbal elements in teaching is so important and the pupils should learn how to work with the non-verbal elements (according to Janko 2012, 25). The point is that an individual can not only „read“ the pictorial material but also „utilize“ the visually acquired information (Bílek et al. 2007, 10). In other words, it is desirable to develop the pupils' capacities so that they could realize links between the image and the imaged object and would be capable of back transfers between them (Maňák, 1994, 54–55), which is extremely important in perceiving the landscape.

Perception of Urban Landscape – Comparison of School Pupils and University Students

One of the tasks of the research was to compare sketches made by school pupils and university students after checking that the two groups can perceive the urban landscape structure and make a realistic sketch of it. Two aspects were taken into account in the comparison – width of the imaged area and the number of identified objects.

Since the landscape represents a dynamic geosystem with a spatial, temporal and functional structure, the panoramic sketch can be a useful method for teaching geography, namely if the sketch can be repeated after several years with the same group of pupils.

In terms of differentiated roles, Miklós and Izakovičová (1997, 29) distinguish three types of structures in the contemporary landscape:

- Primary landscape structure – a set of those landscape elements and their relations, which form the original and permanent base for other structures;

- Secondary landscape structure – sets of natural dynamic systems either partly or completely affected by man similarly as newly created artificial elements;
- Tertiary (socio-economic) landscape structure, which is a set of intangible elements and phenomena such as interests, manifestations and consequences of society activities and individual branches of industry in the landscape that are ecologically relevant to the landscape, i.e. are bound to tangible elements of the primary and secondary landscape structures while having a spatial manifestation. These elements are considered as socio-economic phenomena in the landscape – e.g. mining and industrial sites, traffic areas, agricultural categories, recreation areas, protected areas etc.

Kolejka (2011) defines also a quaternary (intellectual) landscape structure, which can be understood as a symbolical spatial model perceived as “genius loci” of the landscape, given by both imaginary and actual events (e.g. battlefield, legend etc.).

Urban landscape structure emerges and is maintained in its existence by urban processes, which show through various modifications of the internal and external space of towns. Within the gradient of landscape being affected by human activities, urban landscapes have a specific position. This is given especially by the concentration and high intensity of human activities. Built-up area has a dominant position in the urban landscape structure and can be considered a matrix of this landscape type for both its area size and its dominant role in landscape processes (Kovář, 2007). The built-up area represents a dominant element in the sketches of pupils and students from the selected viewpoints. Other elements such as communications, parks or other less expressive objects are not recorded.

However, the assessment of landscape aspects as a non-verbal element cannot be taken for a simple thing. It namely shows that pupils/students may interpret the meaning of non-verbal elements many a time quite differently. This finding is confirmed also in the empirical study published by Bolling et al. (2004), from which it follows that the pupils may conjecture the content (or meaning) of non-verbal elements. Interpreting the content or the meaning of non-verbal elements “in their own way”, they may reflect non-existing things in the images.

This clearly shows also in the sketches of pupils from basic schools – see Figure 3 left, e.g. smoke from the chimney (sketches made in May), window grates that could not be seen from an airline distance of about 2 kilometres and usually do not occur in the windows of office buildings etc. Interpretation of the perceived reality is namely to a certain extent affected by cultural and social regularities “established” in the community. For a teacher it is therefore an essential skill to be able to recognize these regularities and to work with them (comp. Kress, & van Leeuwen, 1990, 94).

By contrast, older pupils/students may require a larger volume of information as compared with younger ones (Figure 3 right) assuming that the expository text in the textbook gives them more data (compared with non-verbal elements). These pupils are often not fully aware of the educational potential of non-verbal elements. Visual literacy is not being developed in them and they are usually not led to work with non-verbal elements during school lessons.

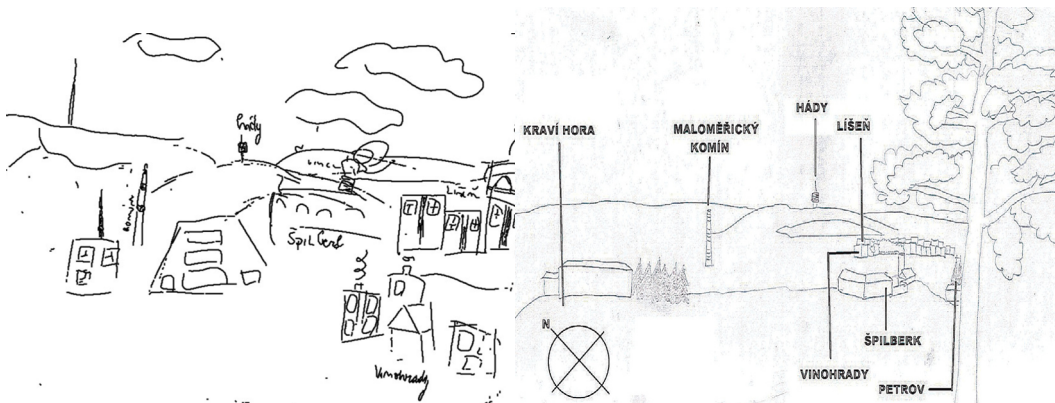


Figure 3: Urban landscape sketched by a pupil (left) and by a university student (right).

Another finding from the comparison of sketches made by basic school pupils and university students is a fact that younger pupils perceive the landscape more often in a narrower view than students and plot a lower number of elements. This may relate to the knowledge of the town in which the pupils usually move around within a smaller space than the older students, being unable to identify and therefore to image the objects. A further research demonstrated however that the older students too are capable of recording in more details a smaller spatial section, which is easier to produce – see Figure 4.

As to the sketching method, there are no marked differences except for the above-mentioned ones and the quality of recording is at all times affected by the “skill” of each pupil/student.



Figure 4: Landscape detail in the municipality of Křtiny sketched by a university student.

Where hardly any differences occurred in the quality of records was the imaging of objects that are dominant in the landscape (hills, chimneys, churches, stadiums ...) and also of objects that are well known to the pupils/students (indoor stadium, transmitter, castle ...). PowerPoint presentations did not much differ either – containing usually photographs, scans of sketches and map documentation. The presentations differed only in the text part where the uni-

versity students showed better communication skills in the technical assessment of landscape structure or viewpoint evaluation.

Discussion – New Approaches in Geography Teaching

The contemporary schooling facility should not teach only what happens around us today but it should prepare its pupils and students for the future, too. This can be successfully achieved only when we teach the students to think and support them in their creativity. Geography provides a range of opportunities for such an activity, which directly follow out from its character. Geography is about the world around us, about a skill to ask geographical questions and search answers to them, which is also declared by the International Charter of Geographical Education (on-line).

Sound fieldwork supports creativity and independent thinking of pupils and students. It can employ both traditional and modern techniques of data collection, classification, processing and interpretation. Especially the use of new technologies in data processing can “wipe off” age differences in the pupils and students. In spite of the fact that GPS work was rather marginal in this research, the authors can confirm based on their experience with the fieldwork that pupils from basic schools can master new technologies at a much greater ease than older students, being able to identify with the new technology and use it. In general, the theme has been explored only very little as a topic of geographical and educational research. And the research has not got to be using the GIS technologies, which make it possible not only to record the studied reality but also to model and create proposals for directions of the future development of the studied landscape. Young people are close to new technologies, namely those who deal with strategic games such as the World of Warcraft and the like. Inspiring in this respect is a proclamation called Geography Education, Creativity and Alternative Futures (de Mers 2013). On the other hand, using modern technologies in teaching can cause a great deal of frustration (Keiper 1999). The role of teacher is however to suppress the fear from new technologies by adopting adequate measures and responsive attitude and on the contrary to motivate pupils and students to use them.

Another novel approach in teaching is the use of aptly thematically focused on-line applications. In the case of panoramic sketches, a similar image can be made as the pupils/students produced by using several freely available applications (Figure 5) of which the most popular one is Google Earth. Nevertheless, no image made by the computer will reveal individual perception of a pupil/student and such a computerized image can serve only as another fieldwork aid.

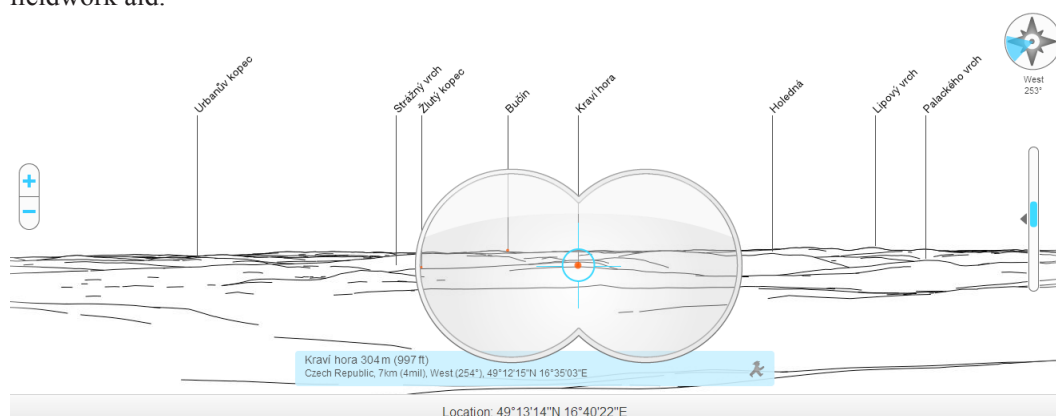


Figure 5: Panorama from the Hádý limestone quarry made in <http://www.peak-finder.org/> application.

Conclusions

Concluding it can be stated that lessons in the urban landscape were given in one year nearly to 150 pupils and students. All respondents informed unanimously that they had never processed a landscape section by using the technique of panoramic sketch. Results of their work indicated that they enjoyed the work and most of them showed a very responsible approach. All participants processed their records from the lessons into a PowerPoint presentation.

The use of the technique of panoramic sketch may seem obsolete and inadequate at the present time. The opposite is true. The use of this technique does not make it possible to record all details viewed. Significant point objects are focused and plotted first, which are then added lines and surfaces. This is how the pupils and students learn a certain generalization of the viewed landscape section, which was used most often in the army to focus strategic objects in the landscape. This generalization of the viewed landscape section enables the pupils and students to better characterize, name and describe its structure. Photographs then represent a useful aid to compare the reality and the sketch, making it possible for them to add details that could not be recorded in the sketch.

For the purpose of teaching, the creation of these sketches is only a beginning for other activities in the urban landscape. For example, the students may further deal in detail with the individual parts of urban landscape and their transformations after having defined their different roles. On the example of Brno as an important industrial centre it will be research into the fate of industrial town quarters. It may also be a comparison of current industrial activities and old industrial sites. This activity can also bring an answer to frequent questions asked by teachers: „What are we to teach in geography of industry?“ The „what“ has to be followed by „how“ but the most important question will be „why“? Because the space in which we live is permanently changing and its further evolution will at all times depend on people. The fieldwork can bring us answers to those questions.

Finally yet importantly, this style of teaching makes it possible for the teacher and the student to learn each other better. As mentioned above, these lessons lead to develop thinking instead of memorizing certain facts. Teachers are still not used to them because they have an open end.

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