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# Selected examples of interactive teaching methods in the Centre of Geoeducation in the city of Kielce (Poland)

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**Abstract**

The article presents the educational activity of the Centre of Geoeducation in the City of Kielce (Poland). The Centre was established in 2012 and thanks to a variety of provided services, it quickly gained a wide audience. By drawing inspiration from a very rich geological assets of the whole Świętokrzyskie Province, the Centre transmits geological, ecological and geographical knowledge, mainly with the use of many interactive teaching methods. The Centre's educational offer involves various activities, i.e. theoretical, practical and field classes. What is more, the Centre of Geoeducation acts as an initiator and coordinator of many cyclical or occasional events which promote geological assets of the Świętokrzyskie Province. The growing number of visits provides evidence for a wide interest of the Centre's activity – in 2013, there were up to 6.2% more visitors than in the previous year. It is worth mentioning that the Centre of Geoeducation is visited not only by organised groups, but also by individual visitors coming from the Province and the whole country, as well as from abroad.


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## 1. Introduction

The possibility of extending knowledge outside the school environment is of particular importance to the development of children and adolescents. It is widely believed that the informal approach to teaching shapes a world view, develops imagination, and especially increases efficiency at acquiring new, often difficult and complex contents (Malcolm at al., 2003). Learning through practice base its assumptions on the full involvement of both teachers and students, by using interactive teaching methods. Their main aim is not only to strengthen, but also to make the process of enhancing knowledge, developing manual skills and acquiring logical thinking more attractive. Another, but no less important quality of interactive teaching methods is that they help foster interactions among students, while integration as well as collaborative problem solving result, *inter alia*, in equalising differences in students' educational level (Sessoms, 2008; Kedrayate, 2012).

The beginnings of informal education are dated back to the 60's of the 19$^{th}$ century (Sharma, 1989), but a real flourishing of various ways to promote learning through practice has taken place in recent years (Hermandez at al. 2013). Moreover, it is believed that the use of interactive teaching methods is gaining popularity thanks to commonly noticeable effects, what indirectly results in improving the quality of human capital and increasing people's standard of living, and in the developing countries – decreasing poverty rate (Handa at al. 2009).

In modern Europe, it can be seen a dynamic growth in the number of centres that specialise in informal ways of transmitting knowledge. One of them is the Centre of Geoeducation in Kielce (Poland) which is based on a very rich geological potential of the Świętokrzyskie Province. Owing to educational offer abounding in many modern interactive tools, the Centre's popularity is gradually increasing what is additionally confirmed by a wide interest of visitors not only from the Province and the whole country, but also from abroad.

## 2. Elaboration

### *2.1. Principles of Educational Offer of the Centre of Geoeducation*

The Centre's premises are located in the area belonging to the Wietrznia Inanimate Nature Reserve named after Zbigniew Rubinowski (prominent Polish geologist) in the south-eastern part of the City, and make up the most important point on the route of the Świętokrzyski Archeo-Geological Trail (Fig. 1). The ongoing activity of the Centre of Geoeducation confirms that education is no longer an exclusive preserve of schools, training institutions, or seats of learning, and the process of education has its place beyond the formal educational systems and is fully voluntary. The Centre is a place where ecological, geological and geographical knowledge is transmitted in an accessible way through using modern methods and didactic tools. That is why, its activity is based on benefiting from a very rich geological assets of the whole Świętokrzyskie Province, whose capital city is Kielce. There are numerous geological reserves of high scientific and tourist qualities so that they provide many unique landscapes and at the same time are an excellent opportunity for preserving exceptional values of geological heritage in the Province (Wójtowicz, 2011).

Fig. 1 View on the Centre of Geoeducation

### *2.2. Selected Educational Activities of the Centre of Geoeducation*

The Centre of Geoeducation has been classified as a museum and exhibition institution. However, as its ongoing activity shows, the nature and specificity of the educational offer differ greatly from those which are typical for that kind of institutions. The Centre's educational offer is indeed based on interactive teaching methods which guarantee a high efficiency of didactic process, so that for most visitors it seems to be an amazing scientific adventure. It also involves various activities, i.e. theoretical, practical and field classes. Noteworthy is the fact that each of these classes consists of some modules which can be compiled by any manner of means, depending on the needs of visitors.

Theoretical classes, despite their name, are not based on conventional teaching methods, but focus on audio-visual transmission. And for this purpose, many multimedia presentations, visualizations as well as short demonstration films are used, which aim at bringing a particular issue closer to the visitors in a different and thereby attractive way (Fig. 2). Many scientists point out that strengthening any transmission with interactive methods, including audio-visual techniques, may contribute to understanding and more efficient memorising of larger amounts of knowledge (Allen and Gutwill, 2004; Schwier 2010). The thematic scope of the educational offer is consistent with the specificity of the Świętokrzyskie Province, i.e. it mainly concerns geological processes, including karst phenomena and endogenous processes. Furthermore, the proposed issues, thanks to the possibility of their optional modification, can be an excellent introduction, complement or even extension of school curricula, being implemented at every stage of education.

Fig. 2 Exhibition hall where theoretical classes are organised

One of the biggest attractions of the Centre of Geoeducation is unquestionably the 5D capsule called "A Journey inside the Earth". This simulation, by engaging almost all human senses, produces an imaginary picture of the internal structure of the Earth which for a while becomes virtual reality. Numerous fossils encountered during the journey enable the visitors not only to learn about environments from millions years ago, but also to understand the changes that they had undergone in the past.

Practical classes in the Centre of Geoeducation are in turn based on the idea of educational workshops which, according to many scientists, successfully activate young people (Eshach, 2006). This form of education, by the possibility of developing manual skills of its participants, has chiefly cognitive character. The workshops aim at familiarising their participants with the geological richness of the Province. The most popular activities involve identifying and then grinding selected mineral specimens, coming from the area of the Świętokrzyskie Province. When grounding, they become souvenirs after visiting the Centre. Another proposal for practical classes are workshops on the secrets of fossils, whose attraction is the possibility of making any fossil model by oneself. And younger age groups can participate in art classes which develop imagination and manual skills by doing paleo carvings.

The Centre's educational offer is additionally enriched by field classes on the areas of nearby geological sites. The proposed trip programmes include two nature reserves, i.e. the Wietrznia Nature Reserve, where there are numerous karst phenomena (both paleokarst and modern karst) and well-preserved Devonian fauna fossils, such as four-radial corals, siliceous sponges, brachiopods, crinoids, as well as fossil fishes (Fig. 3); and the Kadzielnia Nature Reserve with a number of interesting geological phenomena, such as fauna remains (e.g. corals, brachiopods, crinoids, and fossil fishes), calcite ore mineralisation, tectonic and karst forms, as well as rock vegetation relics (Nita and Myga-Piątek, 2010). For elder age groups, the Centre of Geoeducation also proposes a trip to the Ślichowice Nature Reserve named after Jan Czarnocki (prominent Polish geologist), which abounds in interesting tectonic forms as well as numerously preserved herbaceous and shrub vegetation (Wróblewski, 2008).

Fig. 3 View on the Wietrznia Nature Reserve named after Zbigniew Rubinowski

Theoretical and practical classes in the Centre of Geoeducation last 45 minutes, while duration of field classes depends on the visitors' age and thematic scope being discussed during trips. But they do not usually exceed 120 minutes.

Interactive education of the Centre of Geoeducation is also realised through a series of events and initiatives addressed to various age groups. These activities can be cyclical as the project "Winter Holidays with Geology" or occasional as the project "Nature Close to the Blind" which was addressed to disabled people. In order to ensure continuity of activities, the projects are realised at fairly regular intervals, and additionally with increased intensity during each holiday season, due to demand for attractions of that kind. Also noteworthy is that in order to provide high-quality services and appropriate teaching standards, the Centre of Geoeducation is still expanding its educational offer by cooperation with numerous scientific institutions, research and development institutes as well as non-governmental organisations, including the Świętokrzyskie Branch of the Polish Tourist and Sightseeing Society in Kielce.

## 2.3 Interest in the Centre of Geoeducation

The Centre of Geoeducation has been realising educational activities since 2012 and it very quickly gained a wide audience. The growing number of visits provides evidence for this. In 2013, i.e. a year after the Centre's opening, there were 39 136 visits, which indicates up to 6.2% more visitors than in the previous year. Noteworthy is the fact that a great interest in the Centre's services has a permanent character, with increasing tendency during the spring and early-autumn periods (Fig. 4). Thus the table below confirms the need to increase the frequency of educational activities at that time.

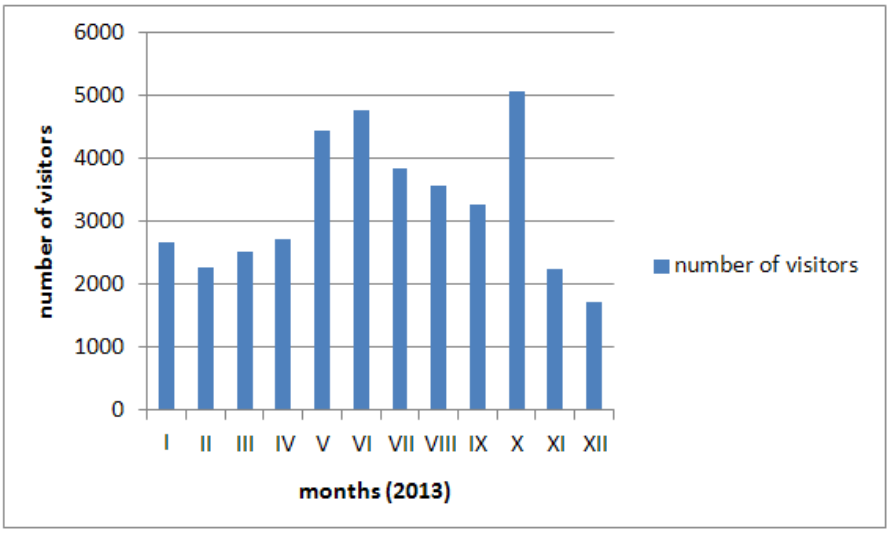


Fig. 4 Number of visitors benefiting from the educational offer in the Centre of Geoeducation in 2013 by individual months

There is a slight dominance of organised groups among the recipients of the educational offer (56%), while the rest of the visits are made by individual visitors (Fig. 5). During the spring and autumn period, there was a greater interest in the Centre's services among organised groups, consisting mainly of pupils and students. An increasing interest among individual visitors is observed in turn during the summer period. This means that the Centre of Geoeducation is regarded as the place of high-cognitive values, which offers alternative ways of spending leisure time.

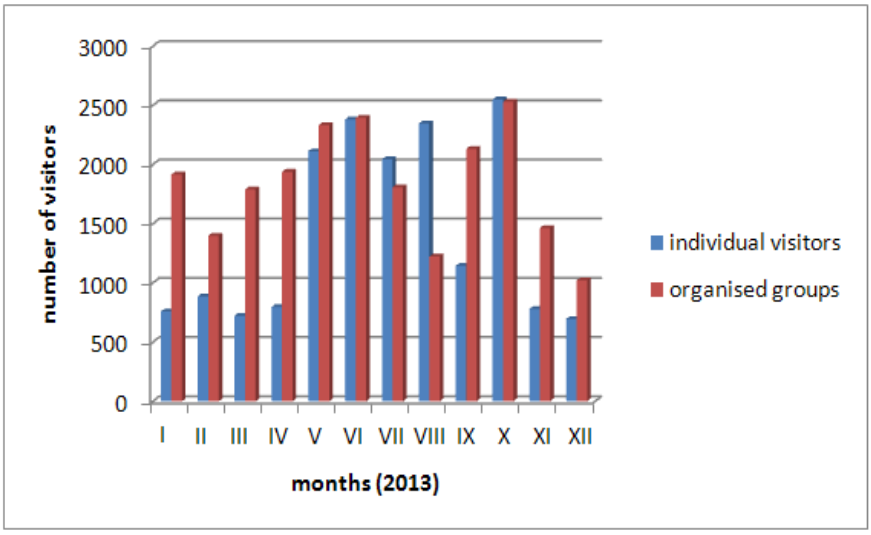


Fig. 5 Variability in the number of visitors benefiting from the educational offer in the Centre of Geoeducation in 2013 by individual months

The Centre's educational activity is innovative and unique as evidenced by the great interest of visitors not only from the Province, but also from the whole country (29%). It is also worth mentioning the fact that the Centre was additionally visited by 19 foreign organised groups in 2013.

## 3. Conclusions

Despite the fact that it can be seen a dynamic growth in the number of museum and exhibition institutions, the Centre of Geoeducation, by benefiting from natural conditions of the Świętokrzyskie Province, distinguishes itself from other institutions of that kind in the country. A wide range of the Centre's educational activities is based on theoretical, practical and field classes, which are complementary to one another and transmit the knowledge about geological conditions of the Świętokrzyskie Province in a comprehensive and accessible way.

What is more, the Centre of Geoeducation offers a number of occasional and cyclical initiatives addressed to the general public. It should be noted that its educational offer is free of charge and available for everyone as well. In addition, it is a domain of free choice so that it is treated not only as an opportunity to enhance knowledge and complement school curricula, but also as one of the effective ways to interest young people in natural sciences. The growing number of visitors, also outside the Province and from abroad, provides evidence for the success of these educational activities.

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