How teachers perceive innovations in education

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Received 27 April 2023
Revised 2 August 2023
Accepted 2 August 2023

Abstract

Purpose – This research study explores the perceptions of the importance and meaning of innovation in education by qualified teachers. The authors deliberately selected geography teachers for the research because the extraordinary dynamics of changes and innovations the teacher has to deal with are significantly reflected, particularly in geography teaching.

Design/methodology/approach – The main aim of the research was to determine geography teachers' views on the importance, role and meaning of innovation in teaching. The research group consisted of 12 qualified teachers, and a semistructured interview was chosen as the research method. The research was conducted over six months, from October 2020 to March 2021.

Findings – This research confirmed the interest in introducing innovations into teaching by the teachers interviewed. Teachers mainly think of innovation as new ways of teaching that aim to revive and make teaching more attractive, to increase the motivation of all actors in the learning process. While teachers with more ample teaching experience connect innovations mainly with presentations, education games, and excursions, teachers-beginners and teachers with shorter teaching experience understand innovations mainly as the application of new trends in education, such as research projects and working with GIS and digital technologies. The research confirmed that lectures supported by presentations are the most frequently used teaching method for explaining the geography curriculum in primary and secondary schools. Presentations in which teachers focus on linking relationships and explaining connections more deeply replace existing textbooks and teaching texts for most teachers interviewed.

Research limitations/implications – The number and qualifications of the teachers involved in the research.

Practical implications – Teachers see the quality of the school environment and the education system as the significant barriers to providing better geography education. They often come to innovations through their own study and activities and feel a significant lack of available materials for the practical application of innovations in teaching. They also perceive the support for creation by state authorities and educational institutions as insufficient. Most teachers interviewed would welcome regular training courses and vocational education on the appropriate introduction and use of innovations in the classrooms in the form of practical examples and developed methodologies.

Originality/value – The selection of teachers for the research was deliberate and included active teachers of both genders working in primary and secondary schools. The selected teachers had varying teaching experiences and studied different combinations of teaching subjects with geography.

Keywords Innovations, Education, Perception of innovations, Teaching practice

Paper type Research paper

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Journal of Research in Innovative Teaching & Learning
Emerald Publishing Limited
2397-7604
DOI 10.1108/JRIT-04-2023-0039

Innovations in education

The term "innovation" comes from the Latin verb *innovare* and its meaning is to renew. Innovation can therefore be understood in the most general sense as the improvement or replacement of something by the use of a new idea or method (INNOVATION | meaning in the Cambridge English Dictionary, 2022; Frolova *et al.*, 2018; Brewer and Tierney, 2011).

Innovation in education means solving a real problem in a new, simple way that promotes fair and equitable learning. (Strengthening education systems and innovation | UNICEF, 2022). It seems most useful to consider pedagogical innovation as a process rather than an outcome and innovative teachers as people who engage in that process (Gilbert *et al.*, 2020).

Innovation takes practical form mainly through the implementation of reforms. Reforms are therefore processes, methods, and strategies to achieve improvements. In pedagogy, reform movements were most developed in the first half of the 20th century by reformers such as J. Dewey, M. Montessori, J. Piaget or P. Peterson, who, in addition to theoretical concepts, also brought real working models of alternative schools into practice (Průcha *et al.*, 1995, p. 187).

Today's differentiated society confronts us with questions: Who are we? What kind of society are we living in? What are our values? These issues are explored in a number of subjects, but they are particularly closely linked to geography. It is the teaching of geography that provides the methodological basis for addressing current sustainability issues and responding to the present and future implications of a rapidly changing society (Yli-Panula *et al.*, 2020).

The study of geography helps people to understand and appreciate how places and landscapes are formed, how people and environments interact, the consequences that arise from our everyday decisions (International Charter on Geographical Education, 2016).

A postmodern understanding of geography requires more humility, the education of individuals to be sensitive to social issues, and more carefully considered and empirically grounded claims. Less emphasis is placed on the classification and identification of objects or processes (Cloke *et al.*, 1991).

Perception of innovations by geography teachers

Innovation in the educational process presupposes some kind of continuous change on the part of the teacher in his/her approach to teaching and learning (Markee, 1993). However, if the philosophy of innovation is incompatible with educational attitudes of teachers, it is likely to lead to conflict and resistance of teachers to change (Breen, 1983). Therefore, it is important that there are open channels of communication between the creators or initiators of reform changes and teachers (Brindley and Hood, 1990).

Cochran-Smith (2003), Hargreaves (2000), Könings *et al.* (2007), Randi and Corno (2000) present innovations in education as a practice-oriented model of teaching. They understand the process of innovation as an idea that we perceive as new idea, the adoption of a new idea, a change aimed at improving educational procedures, targeted and planned efforts aimed at qualitative improvement of educational processes.

Innovative geography teachers are persons who follow trends in their field, are aware of their shortcomings and work to eliminate them (Artvinli, 2017).

Several studies have also confirmed that stronger in their commitment to teaching innovation and more successful in overcoming organisational and bureaucratic barriers to innovation are experienced teachers. Although young teachers perceive themselves as more open to innovation and non-traditional approaches; they often cannot cope with organising innovative teaching without sufficient professional help from colleagues and guidance (Glantz, 1998; Palmer, 1993, Tanıt, 2003).

According to the teachers, it is also important that the implementation of innovative teaching methods is preceded by awareness of preferred practices, their implementation in teaching and their effectiveness (Aslan *et al.*, 2018). It is very important to support teachers in developing competencies in curriculum design and implementing their own visions of goals built on the strengths of geography education (Lambert and Balderstone, 2010). In this context, universities have an important role to play in preparing student teachers for innovative education and contributing to the development of education (Brooks, 2013). Due to lack of knowledge about trends in geography, many teachers feel unprepared for innovative geography teaching (Anderson and Leinhardt, 2002; Reinfried, 2006; Segall, 2002; Segall and Helfenbein, 2008) and in order to be able to keep up with the innovations in geography education, they have to retrain.

In a rapidly changing world, geography teachers have to work hard to make their subject relevant and meaningful for young people and their future. One of the challenges is therefore to find a way to prepare teachers for these challenging tasks (Béneker, 2013).

Objectives and methodology of the research

The main aim of the research was to find out what are the views of geography teachers on the importance, role and meaning of innovation in teaching. The research group consisted of 12 qualified geography teachers, and a semistructured interview was chosen as the research method. The research was conducted over a period of 6 months, from October 2020 to March 2021.

The selection of teachers for the research was deliberate and included active geography teachers of both genders working in primary and secondary schools located throughout Slovakia. The selected teachers had varying lengths of teaching experience and had studied several combinations of teaching subjects with geography. Summary information on respondents is provided in Table 1.

The length of the interviews varied, averaging between 45 and 55 min. The interviews were recorded (audio format) and transcribed verbatim, and the transcription's accuracy was repeatedly checked. We subjected the validated verbatim interview transcriptions to a thorough phenomenological analysis. The research questions were only presented to the respondents for the first time during the interview.

The research focussed on four main themes.

Respondents	Gender	Age	Number of years of practice	Combination of teaching courses	Type of school
Jozef	male	43	18	Geography and Mathematics	primary
Martin	male	37	13	Geography and Physical Education	high school
Erika	female	41	16	Geography and Biology	high school
Peter	male	36	8	Geography and Biology	primary
Jana	female	50	36	Geography and History	primary
Dagmar	female		26	Geography and Biology	primary
Michal	male	39	11	Geography and Physical Education	high school
Anna	female	51	37	Geography and Biology	primary
Katarína	female	26	2	Geography and Mathematics	high school
Vladimír	male	40	15	Geography and Technology	high school
Lucia	female	36	9	Geography and Biology	primary
Lukáš	male	27	3	Geography and Mathematics	primary

Source(s): Table by authors

Table 1. Summary information on respondents

(1) The importance of innovations in geography education and their application in the teaching process.

(2) Methods of introducing innovations into the teaching process and the effects of innovations.

(3) Barriers to the introduction of innovations in the teaching process and the school's role in promoting them.

(4) Supporting teachers in introducing innovations into the teaching process.

Results

A semistructured interview

The importance of innovations in education and their application in the teaching process.

a) Innovation

The geography teachers included in our research perceive innovation in education as something new and modern. *"In general, innovations are some new, modern elements that can be used in education" (Lukáš)*. They perceive innovations as a contribution to education, a kind of motivation that brings attractiveness to the teaching process and contributes to pupils' interest in the subject itself: *"Innovation means something new, something unfamiliar, something that hasn't been there before, something that revives teaching and has the potential to improve education in the future" (Jozef)*.

By innovation, teachers imagine the transformation of something established, traditional.

"By pedagogical innovation, I mean the so-called awareness of, or attitude towards, new ideas or the transformation of the pedagogical system within individual subjects, the way of learning, etc." (Dagmar).

Interviews with teachers also show that they associate innovative change with a sense of dissatisfaction with the traditional way of teaching and the updating of curricula and teaching content. *"In this pedagogical innovation, it is important to set a goal – what do I want to achieve? What do I want to bring new?" (Dagmar), "When it comes to innovations, I imagine changing the old teaching" (Jana)*.

All of the teachers in their statements indicate that they use innovative elements in the classroom, with four perceiving the requirement to teach innovatively as an essential part of their profession. The same number of teachers see innovation as extra work and perceive innovation as something that is not asked of their colleagues or management. *"I can see the difference between the time that my colleagues and I have. We have the same remuneration, while they have more time for their personal life" (Milan)*.

A summary of the views of the teachers interviewed on the concept of innovation is given in Table 2.

b) Innovative teaching

By innovative teaching of geography, the interviewed teachers mean a different approach to teaching than the traditional one based mainly on memorisation of facts. Innovative teaching is characterised as more interesting, based on pupils' active participation and the acquisition of practical, life-applicable knowledge. *"For me, they represent a change in the education system, which is focused on conceptual knowledge and knowledge that is relieved of a lot of unnecessary facts" (Katka)*.

The teachers interviewed combine most often innovative geography teaching with digital technologies, conducting student research, working with graphs and creating maps. *"Nowadays, I think it's more than necessary for children to work with these modern software*

Code	Number of teachers
new and modern	12
beneficial for education	12
Attractiveness	12
Motivation	12
changing the traditional way of teaching	12
updating curricula and curriculum content	12
teaching for the future	12
openness	12
durability of knowledge	9
career development	9
part of the profession	8
necessity	4
extra work	4
new does not mean better	3

Source(s): Table by authors

Table 2. A summary of the views of the teachers interviewed on the concept of innovation

and options that I didn't have as a pupil" (Michal). The application of digital technologies in geography teaching is perceived as an important manifestation of innovation, especially by younger teachers. The more experienced and older ones do not attach so much importance to them and think of innovations in geography teaching as presentations, games, knowledge competitions, as well as the enhancement of the school surroundings and excursions. *"I don't think focusing on technology alone is the future of geography. It is a plus to know them, but I prefer more personal contact with geography, with nature" (Anna).*

Teachers perceive the interdisciplinary nature of geography as an opportunity for innovation by linking teaching topics from several subjects and developing pupils' communication skills through guided discussions. *"For me, innovative geography lessons mean the connection of geography, biology and chemistry within all possible relationships to complete the curriculum" (Dagmar).*

The characteristics of innovative teaching of geography from the point of view of teachers are presented in Table 3.

c) Innovative teacher

All the teachers addressed are aware of the great challenge of preparing and implementing innovative teaching. In their view, innovative teachers are qualified professionals who must continually update their knowledge of the discipline as well as the theory of teaching. *"Part of the innovation results from changes in society, from new trends in teaching, part is linked to changes in the content of the curriculum (geography as a subject is constantly struggling with the relevance of knowledge, e.g. in connection with the dynamics of the development of global society) and part results from the willingness of educators to innovate their knowledge and skills in line with the trends of modern society" (Erika).* More important than the content of the curriculum, the teachers interviewed consider the way in which the curriculum is delivered and made accessible to pupils in the classroom. Traditionally conducted teaching lacks creativity, the application of constructivist principles and causes a general lack of interest of pupils in the subject. *"The biggest inspiration was that I was getting away from the things that I wasn't enjoying as a student learner, so I didn't want to pass it on to my pupils. For example, if I didn't enjoy writing word-for-word notes, why would I waste my time with that as a teacher? (Lukáš).*

In terms of the expected skills and competences of innovative teachers, all respondents agreed that it is extremely important for such teachers should know the principles of good communication and its management: *"They must be able to engage, provide space for discussion, conduct dialogue with students and involve them in the teaching process." (Lucia).*

Code	Number of teachers
changing the traditional teaching of geography	12
fewer facts to memorise	12
orientation to practical skills	12
attractiveness	12
active activity of pupils during lessons	12
development of communication skills	12
use of inter-subject relationships	11
application of digital technologies	9
carrying out pupil research	7
working with charts	7
developing up-to-date local and global awareness	7
competitions, games	4
presentations	3
excursions	3
improvement of the school	2

Source(s): Table by authors

Table 3. The characteristics of innovative teaching of geography from the point of view of teachers

Skills and abilities of innovative teachers preferred by respondents are given in Table 4.

d) Introducing innovations in the teaching

a) Teaching methods

From the perspective of the teachers interviewed, the most significant incentives for introducing changes and innovations into the teaching of geography are the expressions of disinterest on the part of pupils. *"The experience of the students influences me a lot, when one sees bored students in class, one has to do something about it. One has to change the way of teaching, the content of teaching, the form, etc., even if it takes a longer time" (Michal).*

Teachers combine innovations with the application of selected teaching methods and resources. The greatest emphasis is placed on the development of communication skills of pupils through guided discussions, as the ability to argue, to learn to accept a different opinion, to explain and justify one's attitudes or solutions, are of key importance in everyday life. All the more surprising is the fact that amongst the most frequently used teaching methods applied in the interpretation of the curriculum, the teachers interviewed mention lectures. *"I have everything ready as PowerPoint presentations. Actually, I do not use the lessons to write notes, they can print them out at home, or write in class if they want. This is also how it works in a traditional classroom, not just remotely" (Lucia).*

The experience of the respondents with the application of innovative teaching methods in geography teaching is presented in Table 5.

All interviewed teachers mentioned practical experiences with collaborative teaching in their interviews. This learning strategy is, according to teachers, essential in developing

Code	Number of teachers
adaptability and topicality	12
activity and creativity	12
communication skills	12
digital skills	9
flexibility	8
self-reflection	5

Source(s): Table by authors

Table 4. Skills and abilities of innovative teachers preferred by respondents

pupils' social skills such as self-reflection, acceptance and the ability to work in a team. The answers of the respondents showed that secondary school teachers use this method significantly more often than primary school teachers. The reasons given by primary school teachers for not including collaborative learning activities in the classroom are mainly the lack of communication skills of the pupils and the fear of taking personal responsibility for the results. *"Working in groups is challenging due to the current conditions in the school. With 26 pupils, it is difficult for pupils to work in groups, there are too many of them and they do not have the conditions for that. It is also difficult for the teacher to check all the groups and even more difficult to conclude the lesson" (Martin).*

Half of the teachers included problem-based learning among the innovative teaching methods used in practice. The respondents agreed that it is one of the most effective teaching methods both in terms of the durability of the knowledge acquired by pupils and the connection of the curriculum with real life and the preparation of pupils for future careers. Teachers see an obstacle to the wider application of problem-based learning in the fact that, after defining a problem, pupils can get stuck in finding connections and justifying the reasons for its occurrence."*The school organises special days based on problem-based learning, aimed at linking subject relationships. The subject of these days is the exploration of problems and the preparation of projects that the pupils themselves come up with and implement. This has proved to be extremely useful to us" (Lukáš).*

Experiences of inquiry-based learning were confirmed in interviews by only four of the younger teachers. *"With the application of the scientific inquiry method in teaching, enthusiasm gradually decreases with age, and older grades have little interest." (Martin). "Personally, I implement scientific inquiry teaching by taking pupils through a series of tasks of varying difficulty, building on each other, and having pupils extract knowledge from them. Others choose a fundamental research question, and then, from the materials we have, we explore how and why" (Katka).* Teachers perceive this teaching method as very progressive and innovative, but they lack sufficient professional information and application of exploratory teaching methods and practices in the classroom.

For all the primary school teachers interviewed, keeping pupils' attention is a major challenge, which is made possible by interactive games and quizzes. Examples of mobile software applications that teachers use in particular to access new topics and brainstorm are KAHOOT, QUIZES or SLIDO. Primary school teachers prefer fieldwork, which they associate with school improvement: *"In geography, we planted trees with pupils and taught them how to take care of them" (Lenka).*

Code	Number of teachers
lectures	12
project-based learning	12
discussions	12
excursions	12
collaborative teaching	12
didactic games	9
brainstorming	8
knowledge quizzes	7
fieldwork	6
problem-based learning	6
investigative learning	4

Source(s): Table by authors

Table 5. The experience of the respondents with the application of innovative teaching methods in geography teaching

b) teaching resources

All teachers use presentations in their teaching, which are supplemented by discussions by secondary school teachers. The second most used tool is virtual maps, which teachers prefer over wall maps from a practical point of view: *"I find carrying maps from classroom to classroom annoying. I prefer to show them the map on an interactive whiteboard. All the 2D tools can be projected onto the board, therefore I attach greater importance to 3D models and original models such as rocks, soil" (Katka)*. It is also important for primary school teachers to make lessons interesting and engage more senses of pupils: *"The pupils really enjoyed modelling the layers from plasticine. They liked the fact that they were creating something on their own, playing and learning at the same time. Everybody understood it then" (Lukáš)*. The statements also show that older teachers tend to use textbooks and stick to them in their teaching: *"I rely on textbooks, which are the basis on which I proceed with my teaching" (Anna)*. However, most teachers supplement textbooks with workbooks. Teachers interviewed rarely use digital technologies to support their teaching. From audio-visual aids, videos of experiments and documentaries predominate amongst teachers. *"If I explain to fifth graders about lithospheric plates, it is necessary to show them on 3D models. When we talk about these physical topics in elementary schools, pupils have a hard time projecting abstract phenomena. Especially there I require the use of aids" (Martin)*.

All of the teaching resources used by respondents in geography teaching are presented in Table 6.

c) Information Sources

When preparing a teacher for an innovative geography lesson, most teachers interviewed prefer to search for resources available on the Internet. They also make use of online learning channels and online courses available. Teachers prefer channels and videos that are in Slovak or Czech language*: "I see the most potential in making short videos that include brief but thought-provoking information and also experiments in geography that we don't have time for in class. It would be a great help." (Jana)*.

Some teachers rely on collaboration between colleagues with whom they exchange teaching materials. Respondents make greater use of online teacher websites and Facebook groups. All teachers interviewed reported that they would be the only geography teachers in the school who would accept more interaction with teachers of this subject: *"I follow websites on the Internet, many useful tips or on-line webinars are shared there. Sometimes there is chaos*

Table 6.
Teaching resources used by respondents in geography teaching

Code	Number of teachers
presentations	12
virtual maps	10
audio-visual aids	10
worksheets and notebooks	9
3D models	9
interactive software tools (quizzes)	7
real objects	7
wall maps	6
textbooks	6
charts and diagrams	6
digital technologies	6
computer simulations and 5D models	3

Source(s): Table by authors

on those websites, because there are different teachers from all over Slovakia. I can imagine that such a website would only be for geographers" (Jana). An inspiring, but unfortunately unique, way of helping to prepare for lessons was reported by a private school teacher who has a special lecturer available for this case: *"Otherwise, we have our own lecturers at the school who are very helpful in organising and introducing the new activities they have come up with. It helps teachers to orientate themselves in innovative activity, which is irreplaceable help" (Katka).* Sources of information used by respondents to prepare innovative teaching are presented in Table 7.

d) Barriers in introducing innovations into the teaching process

The teachers interviewed must address several obstacles when incorporating innovations into geography lessons. Ten teachers agree that geography is in the background compared to other subjects and does not receive adequate attention. This significantly influences attitudes of pupils to the subject itself and to the geography teachers themselves: *"To a large extent, this is also influenced by the set-up of the education system, where geography is at the tail end and pupils take it that way. Quite often I hear things like this is just geography, I won't need it in my life. The current system gives preference to only two subjects (let's figure out which ones) and puts the others at the second place, with regard to geography, I'd say third one" (Martin).*

Ten teachers see a problem in the low time allocation, which they consider insufficient: *"For that one hour a week, I'm happy to go over the basics, and it's difficult to incorporate new methods with that kind of time allocation" (Martin).* The content of the curriculum is criticised by five teachers and four teachers criticised the inappropriate structure and choice of topics within individual grades: *"Every year I encounter problems with pupils who have just entered the second level and I run into them at the geography lessons with planetary geography" (Milan).*

In the interviews, various problems with the content of geography textbooks were mentioned by all teachers. Teachers agree they are unattractive to pupils because they do not contain any activating tasks. They also criticise the prevalence of descriptive explanations of concepts without links to causes and contexts and their lack of relevance: *"I try to make students work with up-to-date knowledge, which doesn't always match their content" (Erika).*

Another obstacle often reported by teachers to putting innovative geography teaching into practice is the time-consuming nature of preparing such lessons and the lack of financial remuneration for the work of an innovative teacher: "*Innovative teaching is not easy. Preparing for such a lesson requires a lot of time. The search, the preparation itself takes hours of my free time. I take the time burden as the biggest disadvantage" (Peter).* Other problems are seen in the lack of real experience in applying innovative practices and also in the lack of appropriate teaching materials. *"A big obstacle for me, when I think up the lessons, is to*

Code	Number of teachers
websites	11
online communities	7
videos	6
educational courses	6
national projects	5
colleagues	3
academic papers	3
mobile applications	3
attendance at conferences	2
special lecturer-mentor	1

Source(s): Table by authors

Table 7. Sources of information used by respondents in the preparation of innovative teaching

correctly design the method and form of innovative teaching, to which the field of geography should be directed" (Michal). Lack of teaching experience makes teachers feel insecure**:** *"Implementing innovation depends entirely on me. I try to think of innovations myself, prepare them and try to apply them to the lesson according to what I find interesting. The fact that my lesson works out according to my plans is often the exception rather than the rarity." (Lucia).* Another reason for problems with the application of innovations to the teaching process mentioned in the interviews is that pupils are used to traditional teaching and do not know how to proceed with work requiring active participation in lessons. *"I spend most of my time explaining and guiding what the pupils have to do, because it has never happened to me that the pupils work independently and at the same time, we have reached the desired goal, so I tell them what to do." (Martin).* They also perceive organisational complexity as a significant barrier to innovation. *"The disadvantage for the teacher in introducing innovative activities that the pupils find interesting is that it sometimes slips into a discussion circle among the pupils, which is already going in a different direction than the goal." (Lukáš).*

The majority of teachers interviewed rate their support from the school as sufficient. Nine teachers reported poor Internet connectivity as problematic which relates to their school's technical facilities: *"We have both computers and tablets available, but the poor Internet connection has been a problem for me just downloading videos, let alone larger programs" (Lukáš).* Table 8 shows barriers to introducing innovations in teaching were mentioned by the respondents.

e) Training of teachers in the field pedagogical innovations

All teachers interviewed expressed an interest in continuing professional education*: "Courses are needed because teachers' motivation is gradually decreasing. It is necessary for them to stay updated on what is happening. The stereotype is unsatisfactory in this case" (Vladimír). "If nowadays, especially now in the era of online education, the teacher has not learned new practices to engage pupils, then it is necessary that such teachers be selected. After all, they will never be innovative if distance learning hasn't forced them to be" (Peter).* Teachers consider training in didactics and pedagogical innovation to be the most important: *"I feel much more confident in that geography than I do in the pedagogy itself" (Vladimír).*

Table 8.
Barriers to introducing innovations in teaching mentioned by the respondents

Code	Number of teachers
number of topics in textbooks and curricula	12
number of descriptive facts without connections and absence of activation tasks in textbooks	12
insufficient attention paid to geography compared to other subjects	10
insufficient involvement of teachers in curriculum design	10
insufficient time allowance for geography lessons	10
lack of experience, materials and information on innovation	9
time-consuming preparation and implementation of innovations	9
poor Internet connection	9
lack of experience with innovative teaching methods	8
predominance of regional geography in the curriculum	5
financial reward for innovative teachers	5
lack of mutual cooperation between colleagues	5
poor selection and distribution of geographical topics	4
unequal requirements within the grades	3
lack of cooperation with parents	2

Source(s): Table by authors

f) Requirements for further education

Half of the teachers interviewed rate the education modernisation webinars they have attended as general: *"I participate in webinars if I'm interested in the topic. Most of the webinars, if they mention innovation, are very general and it's harder for me to apply directly to geography" (Erika).* A requirement of all teachers is the effectiveness of training. *"I am interested in attending training courses, but they have to be a tool for me in my subject. Then it's a good motivation for me and not a waste of time" (Lukáš).* All teachers report that they would welcome training courses that link innovation to the subject of geography. *"Such training courses, which will focus directly on innovations in geography, so we have ideas exactly about the topics we teach. To be more practical for the subject itself" (Jana). "Teachers learn the basic principles and objectives, but translating this into a concrete methodology for geography is already difficult" (Katka).*

All teachers prefer face-to-face training to online training with made personal contacts and networking: *"Personal training is more effective for me. Online training also has its advantages" (Jana). "Despite the time commitment, I prefer face-to-face training for networking" (Milan).* Teachers mainly report transport as a disadvantage of face-to-face meetings.

From an organisational point of view, teachers would welcome shorter and more regular training courses: *"I would definitely like more regular training. I know it requires my free time, but ultimately if they are beneficial to be applied directly to the subject of geography, which I lack, it will reduce time of my preparation. I like it best if the same group of teachers meet several times and get to know each other" (Jana).* The requirements of respondents for further education are presented in Table 9.

g) Proposals for improving the introduction of innovations in teaching

The teachers interviewed consider the most important change for the future to be the modification and updating of educational standards and curricula. They particularly criticised the content of geographic education, which is based on a lot of descriptive regional knowledge. *"Likewise, I don't consider all the topics in geography to be well laid out. Personally, I select those that I consider necessary for their future. In geography, I think it makes more sense to focus on themes concerning the society rather than a lot of regional knowledge" (Katka).* Another of the teachers, who is interested in trends abroad, emphasises especially the work with maps, charts, digital technologies in solving the studied issues: *"They use charts, programs, they propose something for their towns or countries, assess transport, land-use planning, etc." (Jozef).*

In the context of professional support, all teachers interviewed would welcome the offer of proven innovative methodologies that are directly applicable in the classroom: *"Methodologies are at the centre of innovative teaching. For me, it makes a huge difference*

Code	Number of teachers
focussing vocational training on the practical application of innovation	12
applying innovation to specific topics in geography	12
personal training courses	12
focus on digital skills	10
shorter and more regular training courses	8
focus on changing the role of the teacher in the classroom	8
personal training courses within the county or town	7

Source(s): Table by authors

Table 9. Requirements of respondents for further education

if I'm preparing for a lesson for which I have done a methodology that is meaningful, tested and builds on itself. Time allocation is even less important factor than well-prepared methodologies. If they are meaningful, I use them as much as possible and adapt them within the limits of the abilities and needs of my pupils. It normally takes me 4 h to prepare a "methodology". And in the end, we find that it comes out wrong. I very much appreciate the networking of these methodologies among teachers" (Katka).

In the case of textbooks and teaching materials, all teachers interviewed recommend reducing the large amount of descriptive knowledge and explaining phenomena in context. Supplement textbooks with workbooks with tasks and activities for students for independent work. *"We use textbooks according to the curriculum. As a teacher, I receive worksheets that I copy randomly for pupils and have them fill in on topics. If the pupils are interested, they must buy them themselves. I would like them to be part of the textbook" (Anna).*

To ensure their own development and to move forward in the field of innovation, the teachers interviewed recommend regularly collecting feedback from pupils in the form of anonymous surveys: *"At the same time, I asked the kids once a month what they thought of my way of teaching. I did it through a Google form and I sent it out to all the classes, sometimes to the parents, and it was very easy to see if I was doing it right and if the pupils were happy with my teaching." (Lukáš).*

To address the time and organisational demands of innovative teaching, teachers suggest dividing the class into two groups with a two-hour allocation of geography lessons every two weeks: *"For me, it's better because we' will be able to discuss the topic in more depth and detail and I do not have to chop it in half. This will give the pupils a complete picture of the topic, which we will be able to go through and also finish in the form of repetition." (Lukáš).*

All teachers find field trips one of the most attractive organisational forms of geography. Their biggest obstacle is the financial burden on the part of the school and parents. Teachers reported one-day field trips as a solution: *"We took a field trip organised by the Hydrometeorological Institute. We only paid for the costs of transport. For the students, it was an excellent practical experience. If businesses offered events like this, I would really like it" (Jana).*

In terms of further teacher training, respondents see regular training courses to be helpful: *"Schools could start doing some courses on innovative methods where they show teachers different new ways of teaching, new apps, programs, etc. I would definitely recommend some extra courses, training on new technologies" (Katka).* Several teachers suggested organising regular face-to-face meetings in the town or region: *"Invite a teacher from practice who will come to the school and present various innovative methods to the teachers. For such a teacher it is important for me to be in touch with real teaching" (Martin).*

As all the teachers interviewed are the only qualified geography teachers in their schools, a major benefit for introducing innovation into teaching would be the creation of a group of natural science or geography teachers, where teachers could exchange information from practice and experience with innovative methods: *"The ideal would be to create a group of people who are offered innovative examples within the subject at regular intervals. Being a geography teacher at school myself, the biggest factor for me is the group of teachers of the same subject, with whom we get to know each other and function as a community, exchanging experiences and ideas and thus fostering innovations in our subject. Innovations are something new for teachers and if they are presented in a one-off way, the teachers get lost in the information" (Katka).*

Summary of results and discussion

The research results confirmed teachers' openness and interest in introducing innovations into the program teaching and their desire to change the current nature of school geography as a descriptive science to geography that teaches students how to apply acquired geographic

knowledge and skills in real life. Our research also shows that the perceptions of teachers addressed show a unified idea of innovation as a new way of teaching, which was created to change traditional teaching practices to make teaching more attractive, to increase the motivation of all actors in the teaching process and to improve the overall educational results of students and the socio-emotional climate in schools. These ideas coincide with the results of the international TED-Ed Innovative Educator (TIE) survey. The teachers interviewed are aware of the rapidly changing society and consider relevance in education to be an important feature of innovation. They consider it essential to develop pupils' critical thinking skills by linking cross-curricular relationships and increasing pupils' communication skills through discussions, while making topics such as global issues or the sustainability of humanity's existence more accessible. These ideas coincide with the principle of imagination, pluralism and moral awareness, which several studies by Bussey *et al.* (2008), Hicks (2012), Slaughter and Bussey (2005) consider as the foundation of education in the future. The teachers interviewed see a change in traditional practices in geography teaching in replacing conceptual knowledge with practical skills focused on students' active activities during the lesson. These principles are the basis of the model of teaching geography in the works of Cochran-Smith (2003), Hargreaves (2000), Könings *et al.* (2007), Randi and Corno (2000) focused on practice and research.

Teachers with longer teaching experience see innovations as mainly the use of presentations, games and excursions, which all the interviewed teachers consider to be a good way to revive teaching. Beginning teachers and teachers with shorter teaching experience consider new trends in education such as research, working with GIS and digital technologies to be innovations, which coincides with the American and British Geographical Association's requirements for the future of school geography (Solem *et al.*, 2013; Bednarz *et al.*, 2013). Similar results were reached by Artvinli (2017), who most often associates innovative geography teachers with digital skills and continuous learning in the field of geography and didactics.

Teachers use innovation most often when explaining new topic. Our research confirmed that teacher lectures in the form of presentations to the whole class are the most frequently used method of explanation by both primary and secondary school teachers, and are most frequently used by new teachers. Teachers are replacing textbooks with presentations that focus on linking cross-curricular relationships and deeper explanations of connections that they feel are missing in textbooks. They tend to complement the presentations with discussions because they see geography as a suitable subject to improve the communication barrier they observe in schools. According to the teachers, the preparation of the presentations itself is already demanding, so they rarely use innovative methods aimed at active work of pupils, which require even more effort from the teachers. All activation methods are characterised by a change in the position and role of the teacher, with the responsibility for learning shifting to the pupils. In this regard, the barriers to teachers introducing innovations into the classroom reported by teachers in our research are consistent with the results of Artvinli (2017). Students who are accustomed to traditional teaching practices have difficulty taking a leadership role in the classroom. It is also a problem for the teacher if the school does not provide favourable conditions for innovative and student-centred active learning (Artvinli, 2017). The teachers we interviewed reported that they have difficulties managing and evaluating groups due to the large number of pupils in classes. Teachers, due to their lack of knowledge and experience with innovative teaching and the role of the facilitator, proceed intuitively and spontaneously when introducing innovations. The result is a gradual assumption of the management role by the teacher and, due to the time-consuming nature of the innovative teaching programme, frequent ending of the lesson without a final summary of the lesson and a conclusion. This contradicts the claims of Jaques (2000) who considers it is the final part of the lesson in the form of the presentation

of conclusions that is the basis of an effective lesson. Unfortunately, the results of our research are consistent with the findings of research (Gerber, 2010) conducted more than 20 years ago. In it, geography teachers working in 32 countries identified lectures as the most commonly used teaching method, followed by working with maps, using group work and working with statistical data. GIS, scientific inquiry-based learning, or experimentation were the least used teaching methods.

For the teachers interviewed, the quality of the school environment and the geography education system are the main barriers to providing better geography education. Teachers perceive geography as a subject that receives insufficient attention compared to other subjects in schools. Teachers consider the biggest obstacle to be the state-imposed time allocation for the subject of geography. The textbooks and the curriculum are criticised for the poor distribution of topics across the grades and their content, which they say does not include developing practical skills. The most common barrier teachers report is the time and organisational complexity of introducing innovations into teaching. This is felt most by beginning teachers. In the context of updating curricula and textbooks, the teachers interviewed emphasise the need for approaches that develop critical thinking and the personal characteristics of pupils.

Teachers consider the availability of well-developed and proven methodologies that focus on specific innovative teaching practices to transform geographic knowledge into a didactically well-thought-out geography lesson programme to be the most significant help in implementing innovations. Our research has also shown that teachers are interested in professional learning on innovation. Teachers are most aware of the need to develop their knowledge and abilities in practical skills, geography didactics and digital technologies. They consider shorter and more regular training sessions to be the most effective. Also, according to the results of a study by Kerski (2003), the implementation of innovative teaching methods increases when several teachers of the same school or subject learn together (Kerski, 2003). Our research confirmed that teachers consider face-to-face contact with colleagues of the same subject endorsement essential for creating a community of geography teachers. This would make a space for up-to-date information on innovations in teaching geography and to share the teachers' experiences from practice with geography education standard-setters. Our research also showed that teachers, as implementers of education, are interested in collaborating in developing educational policies and sharing their practical experience with policymakers.

Conclusion

The introduction of innovations into the educational process implies a constant search for alternative approaches to teaching and learning on the part of the teacher. The aim of the study was to find out teachers' views on the meaning and importance of introducing innovations into the teaching process and to map their previous experiences with the implementation of innovative teaching of geography. Our research focused on the perceptions of the teachers interviewed about the concept of innovation, the teacher's role in preparing, implementing and evaluating the results of innovative teaching, and the barriers that prevent them from introducing innovative teaching resources, methods and strategies into the curriculum.

Our research confirmed the interest in introducing innovations into teaching by the teachers interviewed, who know the importance of these innovative means and practices for changing the predominantly descriptive nature of school geography teaching. Teachers mainly think of innovation as new ways of teaching that aim to revive and make teaching more attractive, to increase the motivation of all actors in the learning process. While teachers with longer teaching experience connect innovations mainly with the use of presentations, education games and excursions, teachers-beginners and teachers with shorter teaching

experience understand innovations mainly as the application of new trends in education such as research projects, working with GIS and digital technologies. The research confirmed that lectures supported by presentations are the most frequently used teaching method for explaining the geography curriculum in both primary and secondary schools, with teachers-beginners using them the most in their teaching practice. Presentations in which teachers focus on linking relationships and explaining connections in more depth are replacing existing textbooks and teaching texts for the majority of teachers being interviewed.

Teachers see the quality of the school environment and the education system as the major barriers to providing better geography education. Most often, they come to innovations through their own study and activities and feel a significant lack of available materials for the practical application of innovations in teaching. They also perceive the support for innovation by state authorities and educational institutions as insufficient. Most teachers interviewed would welcome regular training courses and vocational education on the appropriate introduction and use of innovations in the classrooms in the form of practical examples and developed methodologies.

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