Research Article

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Mathematics Teaching in Slovakia during COVID-19 Quarantine Season in Spring of 2020

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Abstract: In many countries, the attendance form of education was interrupted during quarantine in the spring of 2020 and replaced by some form of distance education. The COVID-19 pandemic has thus tested the preparedness of schools, teachers and educational systems in general to provide various forms of distance education. This paper briefly describes the situation in mathematics teaching in lower and upper secondary schools during the spring quarantine in Slovakia. We focus on the initial reactions and early experience of mathematics teachers. They have used different applications, software and methods in teaching mathematics during this time. Our goal is not to evaluate whether the teachers managed it or not, but what and how they had to do so that the educational process in mathematics would not be interrupted.

Keywords: mathematics; distance education; online education; teaching during quarantine.

1 Introduction

On March 12th the Minister of Education, Science, Research and Sports of the Slovak Republic issued a guideline, which interrupted¹ attendance education in schools and school facilities from March 16th to March 29th 2020 due to endangering the life and health of children, pupils, students and employees of schools and school facilities caused by the spread of COVID-19.² The above-mentioned

guideline stated, that: “Headmasters will ensure, as conditions and possibilities allow, self-study of pupils through electronic communication with pedagogical staff of the school.”³ Universities were ordered to interrupt the *attendance method of study*. Subsequently, they were recommended to replace it with *distance learning* methods for subjects where possible.

Based on the ongoing exceptional situation, the new Minister of Education⁴ extended the closure of schools and school facilities on March 24th 2020 until further notice. In the guideline, the Minister also commented on the content of education: “We will not consider the untaught topics as a problem and we will move them to the next schoolyear.”⁵ The Minister presented the website www.ucimenadiaku.sk for teachers, pupils and parents with information and materials for *digital education*.

Another guideline issued on April 28th, 2020 defined the content of education for the period of extraordinary school breaks by identifying the main and complementary areas of education. The area of Mathematics and Work with Information was included among the main ones, with an emphasis on mathematics. It was recommended to focus on “the core of curriculum of the given year and the curriculum necessary for understanding the curriculum in the next year”, set out in the appendix⁶ of the State Pedagogical Institute, while “it is not expected of pupils to master all prescribed curriculum”. If pupils had already learnt the core of the curriculum during quarantine, in June they were to focus on deepening and repeating it. If the topics had not been learnt by pupils, it was recommended to include them as a new subject, but only

¹ According to the provisions of § 3 par. 8 of Decree no. 231/2009 Coll.

² In Slovakia, the concept “pupil” is usually used for children up to 15 years (who attend primary and lower secondary schools), the concept “student” for all who is older than 15 years and studies at upper secondary schools or universities. In the article, therefore, we often use the concept “learner”.

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³ <https://www.minedu.sk/usmernenie-ministerky-skolstva-vedy-vyskumu-a-sportu-sr-vo-veci-prerusenja-vyucovania-v-skolach-a-skolskych-zariadeniach-z-12-marca-2020/>

⁴ The parliamentary elections in Slovakia were held on February 29th, 2020. During March, the term of office of the old government ended and the new government was formed with a new Minister of Education.

⁵ <https://www.minedu.sk/opatrenia-msvvas-sr-z-24-marca-2020/>

⁶ <https://www.minedu.sk/data/att/16218.pdf>

if the conditions would allow it (i.e. if teachers are in *online contact* with all pupils).

On May 29th, 2020, the Minister of Education issued a decision on the resumption of school education for pupils from the 1st to the 5th grade of primary schools⁷ from June 1st, 2020. Pupils' participation in school was voluntary. Schools had to change the organization of education to allow for the fact that some pupils would continue their education at home.⁸ Pupils in grades 6th-9th of lower secondary schools and all students of upper secondary schools continued to learn in a distance way.

As noted, the terms *self-study*, *distance learning* / *education*, *online* or *digital learning* / *education* have often been used in guidelines by the Ministry of Education. However, it was not exactly and bindingly explained what these concepts actually mean. Distance education (and not just in mathematics) was implemented in various ways. Ideas presented by various media, institutions and schools at all levels of education, even individual teachers and parents, differed diametrically.

In this paper, we focus on a brief explanation of some concepts concerning distance education as well as on mathematics teachers' reactions to and experience with teaching during quarantine caused by COVID-19 pandemic in the spring of 2020.

2 Distance education

First of all, we would like to clarify what can be considered to be a distance education and what its benefits and pitfalls are. At the beginning, we also needed to clarify for ourselves what some of the concepts mean. We have found that the definitions are not strict, they allowed different interpretations. This also follows from the fact that the conditions on the part of educators as well as pupils and students vary greatly in different cases.

The information explosion and the application of modern technologies to all areas of human practice are so significant that education is constantly facing new challenges. In addition to the possibility of developing innovative teaching methods, technologies are also responsible for distorting the concept of distance between learner and teacher and enabling learners to access education at any time and from any place (Beldarrain, 2006).

We can find various definitions and characteristics of the concept of distance education in scientific literature (e. g. McIsaac, & Gunawardena, 1996; Morabito, 1999; Gazdíková, 2003). This is natural, because the rapidly evolving possibilities of using information and communication technologies are constantly shifting the content of this concept to qualitatively new forms. However, all definitions are uniform in that it is a form of education in which the teacher and the learner do not have to be in the same place, but communicate together "at a distance".

2.1 Requirements and conditions for distance education

In the past, correspondence courses in which classical mail was used as a written form of communication, were considered to be a distance form of education. At present, the possibilities of technology present us with many other interesting forms. Distance education means a multimedia form of guided education, in which teachers or consultants are permanently or mostly separated from their students during education. And by multimedia we mean the use of all distance means of communication by which it is possible to convey the curriculum. These can be:

- textbooks or textbooks in the electronic form,
- computer programs,
- telephone,
- radio or television broadcasts,
- e-mail,
- Internet.

At present, distance teaching and learning via Internet (in the following text we address it as online education) is undoubtedly one of the most used forms of this type of education. It can be an attractive form of education because modern information and communication technologies are used for educational purposes. Internet provides the possibility of intensive communication for a learner not only with a teacher, but also with classmates, which has a positive effect not only on the social climate but also on mutual confrontation of opinions. Thus, the student does not remain isolated and dependent only on himself in his study.

Distance education can be applied in all types and levels of study, but it should be emphasized that there are also certain requirements for its implementation. Let's mention at least the basic

⁷ <https://www.minedu.sk/rozhodnutie-ministra-skolstva-o-obnoveni-skolskeho-vyucovania-aktualizovane-29-5-2020/>

⁸ <https://www.minedu.sk/data/att/16392.pdf>

- hardware and software on the part of the institution (teacher),
- hardware and software on the part of the learner,
- information technologies skills of teachers related to the preparation of study materials, but also to communication with students through digital media,
- information technologies skills of learners in using digital media,
- provision of study resources (e-resources, multimedia documents, videos, ...),
- copyright and intellectual property protection.
- We distinguish two forms of distance education distribution:
 - *synchronous* – the interaction between the teacher and learners takes place in the same, real time, but not in one place (video conferencing, online lectures, ...),
 - *asynchronous* – the interaction does not take place at the same time, learners individually choose the time of access to educational materials, they do not study at the same time (correspondence courses, e-mail, ...).
- study is also possible in addition to employment,
- study is also possible for the physically handicapped,
- communication with the teacher can be more effective,
- a modern form of communication increases learners' motivation,
- teachers (lecturers) can be from other institutions or from other countries around the world.
- Distance education can have the following negatives:
 - hardware and software equipment on the part of the institution (teacher) and the student,
 - time-consuming creation of study materials,
 - restriction of direct interactions,
 - increased requirements for learners' motivation.

The use of a specific form depends on the type of education, but also on the learner's age. For example, in the case of asynchronous distance learning, learners are responsible for themselves, and therefore a different type of motivation is assumed than that in traditional education. For this reason, it is more suitable for adults or for personally mature learners.

Muilenburg, and Berge (2005) listed the following eight factors that can affect a learner's access to online learning and even create barriers for the students: administrative issues, social interaction, academic skills, technical skills, learner motivation, time and support for studies, cost and access to the Internet, and technical problems. We also encountered these factors in the teachers' statements in the questionnaire.

2.2 Positives and negatives of distance education

When introducing a distance form of education via Internet, it is appropriate to be aware of the positive as well as the negative aspects.

Positive aspects of distance education include the following:

- a learner can study at an educational institution anywhere and does not have to travel and commute,
- a learner determines his / her own speed of studying,
- a learner studies at the time that suits them,

The distance form of education is currently used worldwide for various types of education (DuCharme-Hansen, & Dupin-Bryant, 2004; Maroš, 2008; Slovák, 2015; Zounek, & Sudický, 2012). In Slovak schools, however, this form is rather exceptional. Before the appearance of COVID-19, it was a complementary form of education mainly used at universities (Kundráťová, Hrmo, & Miština, 2001). However, compulsory quarantine has shown that it can also be used in primary and secondary education. Of course, it can also be useful in specific situations, such as long-term illness, temporary absence due to parents' work abroad or the child's disability. It can be an interesting diversion for pupils and students, especially if the teacher prepares suitable and engaging materials.

Current trends in the field of distance education indicate a radical shift in both instructional design and pedagogy. There is some urgency in being able to provide flexible learning opportunities without compromising the quality of instruction. As technology evolves, so the tools will be available to make it happen (Beldarrain, 2006).

3 Specifics of distance teaching

Initially, each innovation brings problems caused by the fact that people are not yet used to the new way and lack personal experience. In the case of online education in Slovakia, these "beginner" problems are accompanied by technical problems and problems resulting from our common educational models and systems.

In the three-component model for Learning as a Connected Professional (Oddone, Hughes, & Lupton, 2019), which emphasizes the importance of the personal learning network as part of professional learning, the teacher appears also as the learner. Similarly, during the spring quarantine, there were moments where the teacher

Figure 1: Teaching and learning of a teacher and a pupil (or a student) in the distance education in the quarantine (source: authors).

learnt and the learner taught. Teaching and learning of the teacher and pupils and students were mutual – see Figure 1.

A pupil or a student created a shared e-mail account for the whole class, or taught their classmates how to install and use applications, or how to troubleshoot technical problems. The teachers could learn new skills in various digital and social media applications and more technically proficient pupils or students could be their teachers. Improving teachers' skills to create materials for the learners in various software could be appropriate at that time. Another opportunity for a teacher's self-education was the teaching community on social media applications, where they could exchange their materials and pedagogical experiences with distance education and thus learn from each other.

As we will see later, e. g. in communication with pupils and students, at first, teachers used applications what were common for their private communication (e-mail, Messenger), later they gradually learned to work with new applications that were more suitable for the school environment (Zoom, Microsoft Teams, Webex, ...). In (Školníková, 2020) the author (a mathematics teacher) wrote that at the beginning of quarantine they used Messenger for online education in mathematics, because pupils had previously been able to communicate with each other on these social applications. Zoom proved to be more difficult to run and could be used only after all pupils had the application activated. Later, Zoom was more suitable because the whole class could meet online at the same time, which helped them immensely in hybrid education in June 2020, see Figure 2. The author wrote that the pupils were looking forward to regular mathematics lessons, to meeting classmates and the teacher during quarantine. Clarity of design in the environment where the education takes place, interaction with the teacher (instructor) and active discussion among classmates – three general factors that significantly influenced students' satisfaction and perceived learning in online education according to (Swan, 2001).

Motivation to teach and learn for pupils and students as well as teachers could be great. From the learner's point of view, education was conducted via computer or mobile devices (tablet or smartphone), and as such could be a new and very interesting way of education for them. And since the children lacked contact with their classmates and friends, they were happy to "meet" at least in this way. On the other hand, teachers hoped that the pupils' and students' learning would not stop, that there would be no gaps and that no topics would need to be moved to the next school year. However, many pupils and students and teachers lacked motivation, both external and internal. The ministry did not specify either the conditions for teaching or the requirements for schools and teachers. Slovak newspaper SME wrote on April 27th: *"Even more than a month after school closure, many have not yet introduced online teaching. It is not even a duty: each school solves the crisis in its own way. The introduction of online teaching depends on the digital skills of the teachers, but also on the technical equipment of the students."*⁹ And really, the form in which the education took place depended on the management of the school, on the technical possibilities and abilities of individual teachers. The teachers could start something new, but they didn't have to, unless required by the management of their school. The Minister's statement stated that the untaught topics would be moved to the next school year and no pupil would repeat the grade on the basis of his insufficient educational results. If the teacher did not motivate the learners and they did not have internal motivation, then in many cases children considered the interruption of teaching and learning at school as a holiday.

Since mathematics has its own special language¹⁰ and the process of creating mathematical knowledge

⁹ <https://index.sme.sk/c/22389914/niekde-ucitelia-posielaju-maily-ini-ucia-online.html>

¹⁰ And it is not just about a special dictionary or common mathematical symbols.

Figure 2: Zoom screen during online education in June 2020, topic: perimeter and area of the square¹¹ (source: (Školníková, 2020), with agreement of the author; icons have been used to protect personal data).

has its specifics (e. g. in Vukovic, & Lesaux, 2013), self-study of mathematics (from a textbook or other materials) is very difficult for most pupils and students. According to (Schlepppegrell, 2007) mathematics, more than any other scientific discipline, depends on the emphasis on spoken language, the teacher's explanation and social interactions with other learners. In the stage of exposure, this interaction between the teacher and the learner and the learners themselves seems to be irreplaceable to us. A lot of mathematical knowledge arises from mutual discussion in pairs or in a group. The teacher provides the learners with a mathematical content but also with a formal context of the procedures used (e. g. the notation in the process of division by two- and more digit numbers or the geometrical construction). Learners' verbal and non-verbal expressions also provide feedback to the teacher. Many of these specifics were technically unattainable, despite the efforts and improving information technologies skills of teachers.

Fixation was attained not only by solving tasks from exercise books and worksheets but also by solving tasks within projects (including interdisciplinary projects). These had to be solved at home and with the help of the Internet. Discussion and cooperation among learners could be realised in pairs or groups as a video call. An

example from one mathematics teacher – a questionnaire participant – is a project in which 12-year-old pupils had to measure the dimensions of their room, determine its area, find offers of parquets on the Internet, choose one and calculate the price of the order. The result was processing of the procedure in the Excel spreadsheet. Pupils presented their projects at a video conference.

4 Implementation of distance education by Slovak mathematics teachers

In this part of the article, we characterize the sample of mathematics teachers whom we obtained the data from, along with some of their opinions and experiences, and methods that we used for data collection.

4.1 Methods of data collection

We collected the data using a questionnaire survey and an unstructured interview with mathematics teachers. Both activities took place in June 2020.

The questionnaire was prepared in Google Forms and consisted of 18 questions. 4 of the questions concerned with gender, type of school, years of experience in teaching mathematics and percentage of mathematics lessons in

¹¹ The blue marked task is focused on calculating the length of the side of a square, if the area of the square is given (25 m²). The second task (in green) focuses on calculating the perimeter of this square.

their total teaching time.¹² The other 14 questions related to mathematics teaching during the spring COVID-19 quarantine, 3 of which were closed (choice of at least one out of several options), 11 questions required a shorter or longer verbal answer. The questionnaire was anonymous and took up to 8 minutes to complete.

The unstructured interview had a form of a conversation with teachers whom we often cooperate with. As example we can mention Janka, a mathematics teacher, who dealt with the topic of mathematics teaching during COVID-19 quarantine in her final thesis (Školníková, 2020). Sha has a special place in our paper. Excerpts from her work are listed with her name and with her agreement.

In the following text, we present some of the findings and reactions of teachers.

4.2 Participants

The number of teachers submitting the questionnaire was 33.¹³ Most of them (61%) can be included among beginning mathematics teachers, with a length of practice in teaching mathematics ranging from 1 to 5 years, see Figure 3a.¹⁴ And as we can see in Figure 3b, up to 26 of the participating teachers (meaning almost 80 % of them) stated that teaching mathematics represents from 41 to 100 % of their total teaching time.

4.3 Mathematics teachers' experiences

In this section, we will focus on some of the respondents' answers to selected questions from the questionnaire. These, in our opinion, best describe the situation.

¹² We thought that, for example, the gender or the number of years of experience in teaching mathematics may affect the number of hours of the preparation for teaching, or the willingness to use new (not yet used) applications for online teaching (this assumption was based only on our experience). However, no such correlation was obtained from the obtained data.

¹³ The number of teachers we asked to submit the questionnaire was about 60. We assume that some of the teachers we asked who did not complete the questionnaire did not want to comment on this topic, probably because Mathematics teaching was interrupted in their cases during quarantine. Due to slow internet connection, lack of interest and no feedback from pupils/students, or the reluctance of the teacher to change his long-terms way of teaching. But these are just our guesses.

¹⁴ We mainly addressed our graduates of regular or extended study of mathematics, who completed their studies no more than 5 years ago.

The average time the teachers spent preparing for teaching during the week varied. Of course, it depended on their experience level, number of classes they were teaching, number of math lessons they had to teach during quarantine and form of the lessons. In the questionnaire, five teachers stated that they spent 20 or more hours a week by preparation for teaching mathematics. In one case the average was up to 36 hours per week. This teacher (a mother of 2 children) wrote: “... *I made videos for my pupils with different procedures, which I then made available to them on the net. I participated in various webinars organized by the IT academy. It was not difficult. Everything can be learnt gradually, but it was very time consuming.*”

The overview of the applications that teachers used for teaching mathematics and communication with their pupils is shown in Figure 4 (teachers were asked to mark all applications that they used). The most frequently mentioned one was the website www.edupage.sk, which is used by all primary and secondary schools (up to 31 teachers stated this, 10 of them also mentioned it as the most common application used for teaching and communication), then e-mail (26 teachers) and Messenger (18 teachers). We think this reflects the teachers' experiences with various applications for communication in the beginning of the quarantine with their respective schools' management ordering communication through this website.¹⁵ Gradually, as teachers had to adapt their teaching to the conditions and improved themselves “digitally”, other applications were added.¹⁶

In their answers to various questions from the questionnaire, the teachers stated that the websites they most frequently used were bezkriedy.sk, matika.in/sk, viki.iedu.sk, datakabinet.sk, or programalf.com/alf/sk/. Most of these websites require registration, which is made possible through the school where the teacher teaches and which the pupils attend.

It is known that mathematics teachers rely heavily on textbooks in the education process. Pupils and students often use them in class, at home for homework, and also for self-study in case of illness. But we think that in mathematics, due to its specificity, textbooks also need an accompanying instruction from the teacher. During quarantine, teachers had to supplement the role

¹⁵ Of course, we mustn't forget areas where the quality of internet coverage is not sufficient for continuous video calls.

¹⁶ The reason for the relatively high number of used applications was the lack of standardization by the school management or the ministry. This could also cause problems when students switched from one application to another.

Years of experience The share of mathematics in teaching

Figure 3: Questionnaire participating teachers in percentage according to: a) the length of experience in teaching mathematics in years, b) the share of mathematics in their total teaching time in percentage

Applications used for teaching and communication

Figure 4: Applications used for mathematics teaching and communication with pupils in a distance education during the COVID-19 quarantine (in the group “other”, websites used by teachers were included: bezkriedy.sk, matika.in/sk, wiki.iedu.sk, datakabinet.sk, or programalf.com/alf/sk/; source: authors).

of textbooks, their instruction and mutual cooperation among pupils in explaining new topics with additional materials. When they were asked in the questionnaire in what form they prepared teaching materials, respondents marked all of the options offered. Teachers made their own presentations in PowerPoint (or edited other teachers' presentations available from various tutorial databases) or Word and Excel documents in particular, filmed didactic videos, created project assignments. They prepared a large number of worksheets. That is why we asked “Is there anything from teaching mathematics during quarantine that you plan to “transfer” to “normal” attendance teaching?” 10 teachers answered that

they want to use various types of prepared materials (presentations, worksheets or videos) when “returning” pupils to school. Answers concerning www.edupage.sk appeared repeatedly. The website's features include tools for creating and submitting tests, materials and homework, which can then be uploaded by pupils for controlling or rating and 9 teachers plan to continue using. However, 3 teachers replied that they would not transfer anything from that period to normal teaching.

From the total number of 33 respondents only 12 teachers said that their skills with social and media applications improved during quarantine. And while it was time consuming, they made it work. 5 teachers

would have liked to use various applications in online education, but objective circumstances prevented them from doing so, e. g. one of the teachers – beginners: *“Due to a slow internet connection in our village, it was not possible to have video calls and conferences with the whole class or at least a part of the class, I used to work only with edupage.”* Slovakia’s internet coverage is reported by various operators to be more than 97% of the territory.¹⁷ However, in some remote rural areas, a sufficiently fast internet connection may not be available to support a quality video meeting. It is therefore understandable that online education would be difficult to implement in these areas. This probably also applied to the case of areas with a high proportion of pupils from socially disadvantaged backgrounds. Another 5 teachers wrote that they would have participated the questionnaire, but they teach in schools with a high proportion of such pupils and the communication with pupils was very weak. Teachers or their assistants themselves distributed worksheets with mathematics tasks to children to their houses or worksheets were sent to them by post. Not all of these pupils returned the worksheets (they lost them or did not solve their tasks at all) and so teachers did not receive feedback on what their pupils know (or do not know) and whether they worked continuously at all. These teachers often communicated with their pupils and their parents only sporadically and verbally.¹⁸

A similar situation can be encountered in refugee camps with a slow internet connection and unsuitable conditions for online education. In (Dridi, Radhakrishnan, Moser-Mercer, & DeBoer, 2020) the authors recommend blended learning¹⁹ for improvement of education of students – refugees. In blended learning a part of the education is conducted online and at least a certain part is controlled and conducted in another environment. In case of the children from socially disadvantaged environments in Slovakia, the community centres could play an important role. Creating conditions for borrowing a tablet or laptop for study, providing internet connection

and assistance or correcting the tasks and assignments distributed by schools could motivate pupils.

Nine answers to the question “Did pupils or their parents complain that teaching math is difficult? Or insufficient?” also confirm the change in the teachers’ relationship with students at the cognitive level. What seems simple in a classroom and on a blackboard may be incomprehensible in the prepared materials (e. g. Word document or PowerPoint presentation). Therefore, the teacher has to “break down” the problem solution in detail into elements so that even a student with weak abilities can understand it. A teacher, upper secondary school: *“Yes, many pupils had written that they did not understand the topic. Therefore, I tried to create my own notes, often handwritten, with an exact explanation, procedure, description of each step I took (e. g. Vieta’s formulas).”* Several teachers praised the feedback they received from the solved mathematics tasks. These were sent by students to their teachers by e-mail or via Edupage. It is something that usually gets into the hands of teachers only in the form of tests. Although *“for some pupils, the feedback was weak due to technical problems or their poor computer skills”*.

The high get-up-and-go of mathematics teachers also strongly affected their family life. Especially of those who had their own children at home. A teacher, mother of two children under 10 years, said: *“At home it had been already very difficult. The children told me that I don’t smile at all and I’m still working. Now I’m glad my kids are going to school because I’m neglecting them.”* This teacher has taught in a constructivist way for a long time and in this time period she has prepared many worksheets with graded series of mathematics tasks for her students to independently discover mathematical knowledge. Then every weekend, she had spent a few hours rating and evaluating the tasks’ solutions her students emailed her.

5 Conclusion

COVID-19 pandemic has severely affected functioning of almost all areas of society, including educational systems around the world. Ad hoc schools faced the problem of providing continuous education at all levels of education during the period of declared quarantine.

The goal of our research was not detailed mapping out nor evaluating distance forms of mathematics education in Slovakia during the spring quarantine in 2020. Our intention was to obtain early reactions and experience of mathematics teachers, who had to respond flexibly in time of emergency. Our findings show that the topic

¹⁷ www.mojandroid.sk/operatori-4g-pokrytie/

¹⁸ This situation did not only apply to teaching and education in mathematics, it was the same in other school subjects. In general, the education of pupils from socially disadvantaged backgrounds (and especially those from settlements) has been very problematic. It has represented a challenge for experts from the ranks of educationalists as well as sociologists or economists.

¹⁹ “Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and / or pace and at least in part at a supervised brick -and-mortar” (Staker, & Horn, 2012, p. 3).

of preparedness of schools and teachers for the distance form of education is highly topical. Here is our main reason. Among the respondents there were teachers who spent a lot of time preparing various materials for their pupils. They were also willing and able to teach online and synchronously through applications almost daily. But there were also teachers who did not use at all such communication and interaction with their pupils. They only assigned tasks from textbooks and working books to the website edupage.sk due to a weak internet connection. Another reason for not starting online and synchronous education in mathematics was probably the lack of interest of some teachers to change their approach and learn something new. In these cases, it was not possible to talk about distance education. Pupils were not educated by their teachers, but education was often conducted by parents who had to take over the role of the educator. It was a home schooling. We think that more precise guidelines and standardization of conditions for distance education by the Ministry of Education would facilitate the work of teachers and parents and would not create such differences in the education of pupils.²⁰

In the article, we presented only the results and findings of the initial analysis. We plan to focus on the more detailed qualitative analysis of the obtained data. Due to the repetition of distance education in the autumn, one of the goals is also to implement results in preparation of future mathematics teachers. Because it seems that preparation and implementation of distance education is another of the competencies of a teacher and its necessity arose with this time.

In the first half of July 2020, the Slovak Ministry of Education in cooperation with NICEM (National Institute for Certified Educational Measurement) collected data concerning distance education in the form of two questionnaires – one for school headmasters and the other for primary and secondary school teachers. The goal was to find out the experiences, observations and needs of schools in Slovakia. Respondents were able to express what problems they had to solve and what type of help they would welcome in distance education.

This extraordinary time has created significant challenges for the wide pedagogical community but also for the parents. We think there are significant opportunities to strengthen and develop abilities and skills of teachers and pupils and students in information technology and

online education in the future. These, however, require changing and digitizing the school curriculum.

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²⁰ Differences in pupils’ education have arisen greatly, not only because of their social differences or different approaches of teachers to distance education, but also, for example, because of their parental view of children’s education. But that was not our goal.

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