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ICT-supported methodological opportunities among children in need of special attention

Abstract

Varied and light-hearted methods or tools play an important role in the education of children requiring special attention. It is important for disabled children that the acquisition of the curriculum should not take place in the standard, tedious methods: on the other hand, the transfer of knowledge should not be one-sided. In the 2019/20 academic year, two methodological innovations were introduced in lower-grade classes at the Practice School of Eszterházy Károly University where students in need of special attention also experienced these innovations. As our students prefer to use ICT tools and various applications, it is not by chance that the use of digital devices and ICT technology was an important element in the selection of innovative methods. Getting acquainted with the task editing applications, one of the main aspects of our selection was the personalisation of applications and their suitability for differentiation. Our choice is the LearningApps application. With this tool, interactive educational aids, the so-called learning cubes can be created. In the curriculum, it is important for disabled children to work together, to share a common goal, to experience a sense of achievement, to use different artistic techniques and to enjoy the given work. These were created by Storyline-framework method. This study outlines the practical application of the LearningApps task editing software and the Storyline framework method. These methods greatly contributed to a motivating learning environment where disabled students had the opportunity to experience everyday life and to create a friendly atmosphere with their peers.

Key words: *Learning Apps, learning cubes, kockalapok.hu, online educational aid, Storyline*

In the 21st century, methodological solutions in education shall not exist without the use of information and communication technologies.[1] We cannot ignore the changes in society and those new needs of the labor market which came to existence by the 4th industrial revolution. Teachers shall prepare students for the work environment in which they will need to perform in the future.

Teachers often ask themselves how they can make a school effective. What tools, methods and forms of work can be used to make curriculum processing more efficient? How can they motivate students?

Children in the 21st century are characterized by excessive use of digital devices and they are living in a world of gadgets. It is difficult to achieve significant results with well-known, conventional methods. Our priority is to encourage them to learn and to make their lessons more interesting and more colorful. What can be the solution to this problem? Our choice is the **LearningApps learning cubes** and the **Storyline framework method** that have a lot in common: games, activities and learning.

"In terms of the function of learning, it is a psychic activity resulting a permanent change in the psyche."[2] József Nagy's definition of learning focuses on activity while István Nahalka (2003) concentrates on adapting to changes in the educational research environment: "Learning is part of our everyday life, a defining element in the development of our life path. In addition to conscious, school-learning situations, we face with a number of situations every day in which we learn something subconsciously. Learning shapes our personality and we adapt to the constant changes in the environment around us."[3] Both definitions give motivation for the development of methodological solutions that make student classroom activities more active and varied.

According to Benő Csapó (2008): "The flow of the learning process is two-way. Pre-school and post-school lifelong learning span our entire lives. In addition, it covers all aspects of life (life-wide learning), from everyday life to the acquisition of specialised knowledge required in the workplace",[4] This definition provides further reinforcement for finding solutions that can be applicable beyond school. LearningApps cubes can also be used in the extra-curricular learning process.

Educational use of ICT tools

Éva Gyarmathy (2012) asserts that: "21st century children are currently studying in a 21st century school. Thanks to the rapid development of technology, children encounter digital devices already in their infancy: it influences their thinking therefore, by the time they get to school, the teacher needs to be aware of that. Consequently, in addition to the traditional practices, (s)he must find new tools and procedures to meet the challenges: schools shall not be boring!"[5]

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[2] József Nagy, *21st Century and Education* (Budapest: Osiris Press, 2000).

[3] István Nahalka, "Learning",in *Didactics*, ed. Iván Falus (Budapest: Nemzeti Kiadó, 2003), 103-136.

[4] Benő Csapó, "The Scientific Basis of Learning and Teaching" in: *Green Book for the Renewal of Hungarian Public Education* Károly Fazekas, János Köllő and Júlia Varga (Budapest: Ecostat, 2008), 217-233.

[5] Éva Gyarmathy, *Dyslexia in the digital age* (Budapest: Műszaki Kiadó, 2012).

Introducing new tools and new procedures is crucial in the field of special education and in the education of those children and students who need special attention. In case of students with special educational needs, Internet access and the use of appropriate technologies can increase the effectiveness of learning. A variety of online activities can help to develop their collaboration skills.[6]

When educating children requiring special attention, it is paramount to consider the development of the skills necessary for their learning and their specific pace of development. We must provide them with differentiated development tailored to their individual characteristics and also with the use of special educational procedures and pedagogical methods for therapeutic purposes. The educational use of ICT tools can excellently support this process by using such solutions that also increase student motivation. As for educational technology, it is also important to note that an ideally equipped 21st century classroom[7] facilitates the achievement of pedagogical goals. The contribution of ICT-supported methodological educational elements to digital competence development should also be mentioned. Already in 2006, European Schoolnet showed in a survey of OECD countries that "there is a positive correlation between the amount of ICT use and PISA results in mathematics."[8]

The 2012 National Core Curriculum[9] already paid special attention to ensuring their effective development although this law was repealed by the new National Core Curriculum published in 2020.[10] However, it confirmed the importance of the task anyway:

> "Developmental activities of the teacher play an important role in the development of all children and students. This is notably true for outstandingly creative students or those who are talented in one or more specific areas. Multiply disadvantaged children, children with special needs and children with an integration, learning and behavioural disorder also belong to this category: the latter one is undiscovered in terms of causality, but it is also challenging from a learning-teaching point of view. In order to be able to complete this task, the role of assistant specialties (school psychology, special education, developmental pedagogy) and

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[6] *Top 6 benefits of using technology in the classroom.* School Jotter. (2016, February 18). https://www.schooljotter.com/blog/2016/02/top-6-benefits-technology-classroom/.

[7] György Molnár, "Contributing to the Present and Future of Digital Pedagogy (Results and Perspecti-ves)" MTA-BME *Research Group Open Curriculum Development Publications* IV 2018.

[8] Tünde Lengyelné, Molnár, "ICT as an Education Support System Quantitative Content Analysis Based on Articles Published In Emi" in 2013 *IEEE 63rd Annual Conference International Council for Educational Media* (ICEM), ed. Daniel, TH Tan; Linda, ML Fang (Singapore: Nanyang Technological University, 2013), p. 4.

[9] National Core Curriculum [110/2012 (VI. 4.) Gov.decree. *Magyar Közlöny* 66., June 4, (2012), 10651.

[10] 5/2020. (I. 31.) Gov.decree

the professional activity of teachers are crucial where the different tasks of teachers shall be based on knowledge sharing and mutual help."[11]

In addition to the national core curriculum, special education professionals also draw attention to the need of ICT tools: "Thus, it can be clearly seen that the use of digital technologies and devices does not mean any privilege for people with disabilities (such as students), but it reduces the distance and the difference of accessibility which, due to the fact of disability, also restricts the person in other unaffected areas including autonomy."[12] The conceptual foundation of ICT tools in the field of CSN has also started. "The aim of the application of ICT technologies is to pedagogically help students with CSN, to make them acquire knowledge and also to organize modern learning. A key competence is to familiarize students with the system of tools (and use them adequately) supporting the education of the disabled."[13]

Aims, possible questions

With the introduction of these new methods, our primary goal was to create the necessary motivation for learning in case of students with special needs.

In his research on school motivation, Krisztián Józsa (2002) asserts that "learning-related successes and failures are already experienced by children in kindergarten and primary school, these years are of paramount importance in the development of learning-related motivation. Without their motivation of students, development is meaningless and ineffective. Children's motivation decrease with age which may be affected by their relationship with the school, and with teachers, subject orientation, family background, age characteristics, and so on."[14]

Józsa claims that their level of motivation is really high at the beginning of the 1st grade, but there is a significant decrease starting from the 3rd grade.[15] After having processed the

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[11] National Core Curriculum, *Magyar Közlöny* 17., (2020) p. 294.

[12] Anita Virányi," Specific Aspects of the Learning Organisation and Learning Support for Students with Special Educational Needs in the Information Society," *Methods of Educational Informatics,* ed. János Ollé-Adrienn Papp-Danka-Dóra Lévai-Szilvia Tóth-Mózer-Anita Virányi (Budapest: ELTE Eötvös Press, 2013), p. 134

[13] Magdolna Estefánné Varga and Mária Dávid, *Supporting SEN Learners with ICT Tools* (Eger: Károly Eszterházy University, 2013) 123.

[14] Krisztián Józsa, "Learner Motivation and Human Literacy," *School literacy* ed. Benő Csapó (Budapest: Osiris Press, 2002)

[15] Krisztián Józsa, *Acquisition Motivation: Teaching and Learning Series* (Budapest: Műszaki Kiadó, 2007).

relevant literature, we used the LearningApps learning cubes and the Storyline framework method believing that learning in a playful, digital environment will also become attractive to our students who require special attention.

We examined whether the LearningApps learning cubes and the Storyline framework method meet these objectives or not. We hypothesized that the introduction of new methods would increase student motivation. We expected measurable progress from both the teaching aid and the Storyline framework method. We expected a positive result in the field of class work and we also wished to achieve this progress in terms of home assignments and study results.

I. Interactive teaching aid – LearningApps[16]

In the first section of our paper, we would like to introduce LearningApps, a task management software which is very popular among teachers and students. The programme can:
- consider the specific pace of development of learners,
- ensure differentiated development tailored to individual characteristics,
- arouse children's interest,
- provide useful information.

LearningApps covers these areas and as far as the Hungarian context is concerned, it is very popular among teachers and students. LearningApps is a web 2.0 interface aiming to create educational material. According to Zoltán Szűcs (2014) the definition of web 2.0 is the following: Web 2.0 is a generic term for community-based Internet services where users create content, share, comment, or supplement each other's information within the framework provided by the service provider.[17]

LearningApps.org was created under the leadership of President Michael Hielscher as a joint research and development project of the Bern Pedagogical College, the University of Mainz and the Zittau / Görlitz College. *(Figure 1)*

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[16] *Interaktive und multimediale Lernbausteine.* LearningApps. (n.d.). https://learningapps.org/.
[17] Zoltán Szűts, *University 2.0* (Budapest: Kodolányi János College, 2014)

Figure 1. The home page of LearningApps (logged-in view)

With the help of the **online platform**, we can create and change interactive and online educational aids, so-called learning cubes. *(Figure 2)*

Figure 2. Preview and detailed view of a learning cube

Developmental activities of the Learning Cube Community

We have been in contact with the developers since 2016: within this collaboration, we forward the suggestions of Hungarian users to them to successfully improve the site. The platform's Hungarian translation and the name "Learning Cubes are created by the group of Hungarian master teachers, the Learning Cube Community. Our goal is to expand the methodological tools of teachers and to develop digital literacy. As a result of our coordinated work, the Hungarian promotion of the teaching tool is also possible. We are glad to see that more and more learning cubes are being created by Hungarian users of LearningApps. In order to have quality learning cubes in our catalogue, we also pay special

attention to quality assurance. Upon the request of the developers, we also help to evaluate the cubes. Our Hungarian partner site www.kockalapok.hu has been operating since 2015. Here we provide assistance and give useful ideas to those interested in learning cubes. On this site we present - samples, good practices, and we have frequently asked questions sectino as well. *(Figure 3)* Here we provide assistance and give useful ideas to those interested in learning cubes. On this site we present - samples, good practices, and we have frequently asked questions sectino as well. *(Figure 3)*

We are continuously striving to make LearningApps as popular and widely used as possible.

Figure 3. Our partner site – kockalapok.hu

Launched in November 2016, our Facebook group has a significant number of professional members and the number of users is constantly increasing year by year. *(Figure 4)* Facebook members help each other's work with ideas and suggestions. The Facebook group and the ideas of the teachers are important for feedback or feedback analysis. "For service providers, feedback is the crucial element on the basis of which they can continuously redesign the support system, modify and rebuild the theoretical structure of the content service."[18] In case of our Learning Cube Community, we are constantly trying to take advantage of this role of the feedbacks.

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[18] László Czeglédi, "Library Support for Adaptive Learning Environments," *Digital transformation as a key to experience - based learning*, ed. András Nádasi Agria Media (Eger: EKE Líceum Kiadó, 2018) p. 12.

Figure 4. Facebook group – TankocKApocs – Users of learning cubes

Based on the feedbacks, special education and development teachers are very enthusiastic about creating new and diverse cubes. It clearly proves that the use of ICT tools is relevant in this area as well.

The use of ICT tools in special education is also supported by Dóra Aknai (2019): In our modern world, it is a welcome development that the frequent use of ICT tools and methods can be seen in special education today. As for special education courses, more and more higher education institutions integrate ICT tools into the teaching-learning process where the methodological foundations are also considered in these curriculums. Unfortunately, there are few Hungarian papers related to helping the development of disabled children with modern ICT tools and methods. At the same time, significant progress can be seen among special education teachers in the use of ICT tools. Several special education colleagues share their experiences in their professional blogs where they claim that their work has been recognized in recent years. This also proves that ICT tools are relevant in special education practice.[19]

According to Anita Virányi: "The tools of information and communication technology (ICT) are gaining ground in our everyday and professional lives. Nowadays students frequently use digital devices and ICT tools at school and for home assignments: they are able to use them even before school age. From this point of view, a significant proportion of children with disabilities are not different from their peers."[20]

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[19] Dóra Orsolya Aknai, "Journey into the Unknown - ICT Tools in Special Needs Education," *The Place of ICT Tools, the Posibilities of Their Use in Special Education - Regional Professional Conference* - Programme and Pro-ceedings (Szeged University of Szeged JGYPK Special Education Training Institute,2019), 10.

[20] Anita Virányi, "Knowledge and Opinion of Special Educators about the Relationship between ICT Tools and Special Education," *Educating Children with Learning Difficulties* ed. Zsuzsa Mesterházi (Budapest: BGGYTF, 1998)

What does LearningApps offer?

The site offers **a total of 33 different areas of interest** - for each category, additional subcategories are available from the school preparatory level to vocational and further training. *(Figure 5)*
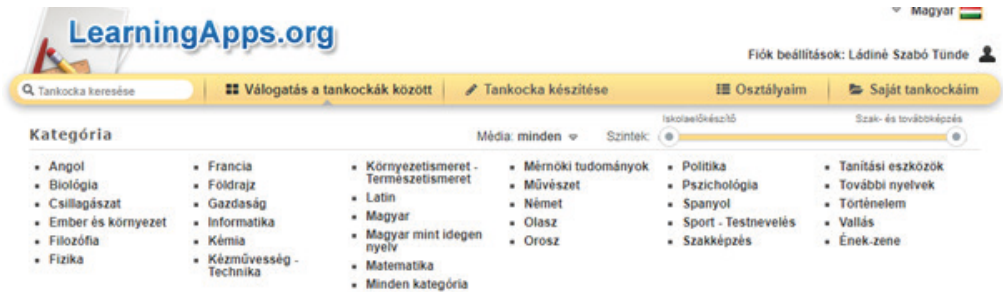

Figure 5. Range of Learning Cubes - Categories

In addition to the categories, the site contains 20 types of tasks where the most popular ones are: simple match, grouping, timeline, brief answer, find the pair, fill-in-the-gap, quiz, learning cube matrix, estimation, hangman. *(Figure 6)*
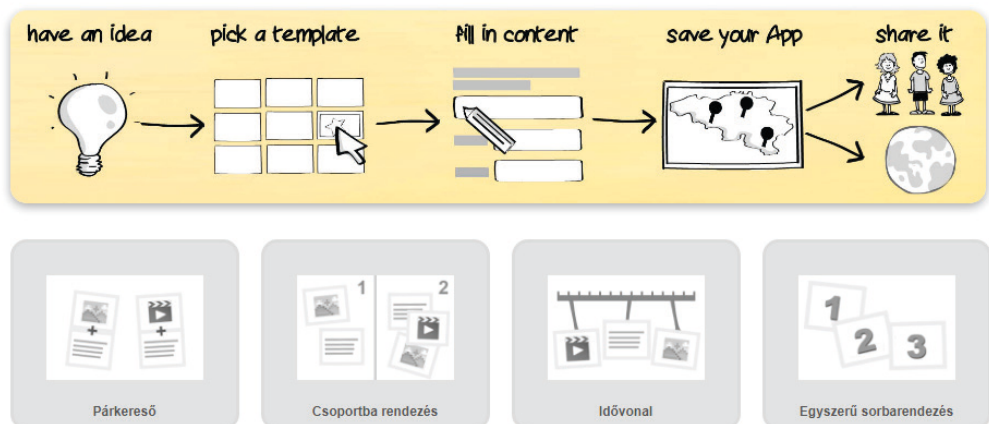

Figure 6. Create a Learning Cube – Task types

The site also includes the following **features**: poll, chat, calendar, notebook, bulletin board *(Figure 7)*.

Eszközök

Figure 7. Features

The software also supports the teacher's work with extensive statistical data.

The most important features of the use of Learning Cubes are also included in the study called "A useful companion in education: let's play learning cubes together!"[21]

According to Hülber: "From the task editing softwares available today, LearningApps. org offers the widest range of task types. Tasks include multiple choice, word finder, pair finder, grouping, matching, crosswords, hangman, etc. Samples are also available and we can create our own individual content. Students can solve the tasks online, in pairs and in groups by using an interactive whiteboard, laptop or smart devices. These tasks control or acquire knowledge in a playful way."[22]

Definition of children/students requiring special attention

According to the relevant law, the education of children and students requiring special attention is carried out within the framework of **differentiated and adaptive education** taking into account individual characteristics. During the differentiation process, the use of learning cubes can significantly develop key competencies which can also make a significant contribution to strengthening equal opportunities.[23]

According to Section 4§ of Act CXC of 2011 on National Public Education:

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[21] Tünde Julianna Ládiné Szabó, "A Useful Partner in Education: Let's Cube Together," *Digital Switch Makes Learning an Experience*, ed. András Nádasi, Tünde Lengyelné Molnár, Antal, Péter, László Czeglédi, Lajos Kis-Tóth, Katalin Göncziné Kapros, Csilla Kvaszingerné Prantner (Eger: Líceum Press, 2018), 119–127.

[22] László Hülber, "Inter-active Online Environments to Support Contact Classroom Activity," *Interactive educational informatics*, ed. Dóra Lévai- Adrienn Papp-Danka (Eger: ELTE Eötvös Press, 2015), 92-112.

[23] Tünde Julianna Ládiné Szabó, "Use of Learning cubes among children and students needing special attention," *Learning Cubes in Complex Basic Programme* ed. Tünde Julianna Ládiné Szabó, Marianna Vizes (Eger: Líceum Kiadó, 2018), 57.

"13. children/students requiring special attention:

a) children/students in need of special treatment:

aa) children/students with special needs,

ab) children/students with an intergration, learning and behavioral disorder ,

ac) children/students with extraordinary talent,

b) children/students with disadvantages and multiple disadvantages according to Act on Child Protection and Guardianship Administration"[24]

During their education, it is important to pay attention to the development of their skills necessary for their school learning and also to their specific pace of development. It is crucial that teachers should become more and more aware of the benefits and effectiveness of learning-cube-assisted development and they should also make its use more widespread among children with special needs.

During development, the teacher must:
- use various teaching methods and (s)he shall alternate these frequently
- have a lesson based on the interests of the children
- integrate the curriculum into smaller parts, small-step progress, complexity
- provide frequent feedback and motivation.

In addition to the abovementioned aspects, they should:
- provide differentiated development tailored to individual characteristics,
- apply special educational procedures and pedagogical methods for therapeutic purposes.

Advantages of the use of Learning Cube

The use of digital tools on the LearningApps site and the fulfilment of interactive tasks contribute to the creation of an experiential, playful learning environment. This can be a strong motivating factor for **children and students who need special attention** and the tasks can arouse their interest as well.

By solving a learning cube, we can make our lessons more colourful and enjoyable. The LearningApps site allows you to create a variety of tasks that fit well into any stage of the lessons.

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[24] Act CXC of 2011 on National Public Education

The site offers various templates where useful content can be added by the special education and development teacher. By this, the tasks can be easily customized and are excellent for differentiating in the classroom.

The site has an easy-to-handle and easy-to-follow layout allowing you to create varied and interesting tasks.

Within a particular learning cube, you can move multiple sensory channels, display image, sound, text, or video excerpts: in this way, we can increase student activity and motivation. During the use of the learning cube, special emphasis is being placed on student activities rather than teacher activities. With the help of this, we can take into account the special needs and working load of our students.

The site's content provides a playful approach which greatly promotes autonomous learning: learners receive immediate, accurate and clear feedback about the solved tasks. While solving the tasks, it is advantageous that student performance is not evaluated on the spot: they can correct their mistakes later.

The site is user-friendly and its response and refresh rate is relatively fast.

Using Learning Cubes can make the teacher's job easier because:
- it is easy to learn, easy to use without technical training, easy to handle,
- by using it, the teacher can easily implement the principle of small steps and complexity
- by using "Creating Similar Learning Cubes" function, the time to prepare for the lesson can be significantly shortened
- content of Learning Cubes can be personalized and altered
- creating successive tasks can also be easily solved.
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Opportunities of differentiation during developments

Differentiation in providing assistance: There are many ways to help children's work. We can give them examples, repeat the task, divide into small steps (*Figure 8*).

Figure 8. Differentiation in providing assistance – repetition, smaller steps division

Differentiation at the level of tasks: with the help of the application we also have the opportunity to provide more content to our faster students and less content to our slower students. *(Figures 9 and 10)*
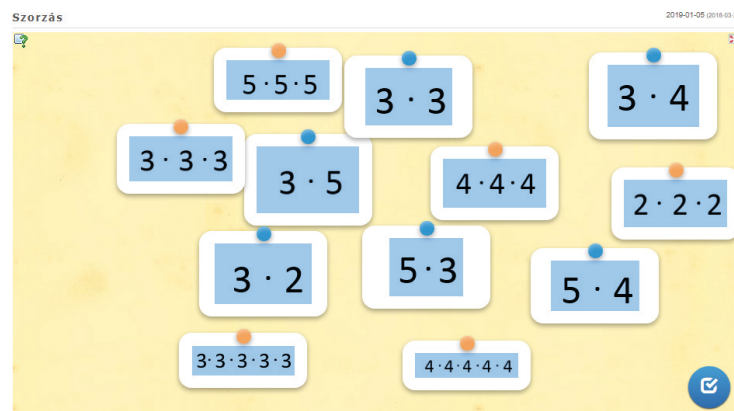

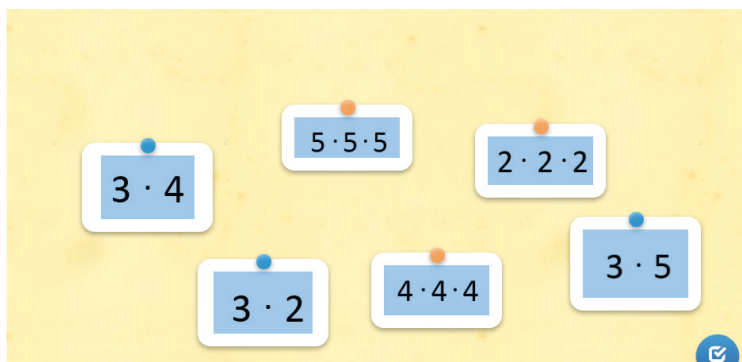**Figure 9. Differentiation at the level of tasks – faster students**

Figure 10. Differentiation at the level of tasks – slower students

We also have the opportunity to differentiate in terms of technical implementation: instead of writing, children with handwriting problems may make words, letters or pictures narrower, perform various movements, etc. (*Figure 11*)

Figure 11. Differentiation in terms of technical implementation. Word-image match; pairing written words with images that contain meaning

Differentiation at the level of activities:

According to their abilities, all children can choose the most suitable Learning Cube. Children quickly understand that there are no easy or difficult Learning Cubes, they can choose according to their taste, abilities and interests. Selection can be made from several

Cube types *(Figure 12)*. The successful solution can greatly increase our students' motivation and sense of responsibility. Tasks meeting the needs and abilities of children can provide a sense of success and help to protect our students from possible failures.

Figure 12. Differentiation at the level of activities

Differentiation at the level of social context:

Solving the Learning Cube provides an opportunity to use various forms of activities among children and students who need special attention. During the lessons, solving learning cubes can be done individually, in pairs or in groups *(Figure 13)*. During these tasks, children with special educational needs also enjoy the activities and experience cheerful learning as well. They participate these Learning Cubes sessions individually, in pairs or in groups. They perform their tasks in a wide range of forms and their communication inhibition may be eased. Working together can greatly help to develop a positive self-image and contribute to the strengthening of the teacher-student, student-student relationship.
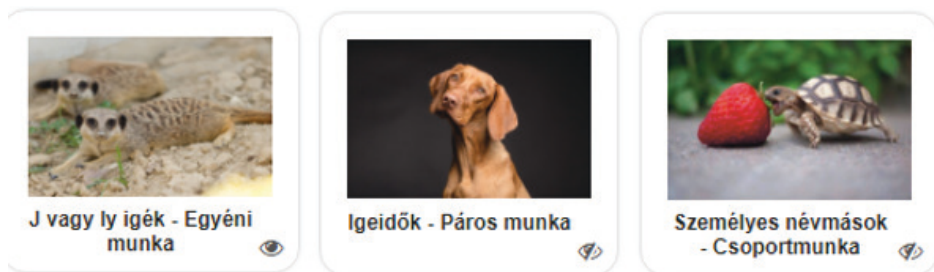

Figure 13. Differentiation at the level of social context

Difficulties in using ICT tools

According to Magdolna Estefánné Varga and Mária Dávid (2013), by using ICT tolls, the following difficulties may arise:
- Excessive use of ICT tools can lead to somatic symptoms.

- If ergonomic features are ignored during the use of our PC, eyes, hands, and back pain may occur.
- The computer is not a substitute for personal, direct experience.
- Its spreading is relatively slow in special pedagogical and school development work.

Reasons of this: the degree of computer and software access and the attitude and motivation of teachers.

The authors emphasize that the computer is not a substitute for the teacher: it functions as an aid in her/his work but it is not the only tool during the development process. [25]

According to the SWOT analysis made by the Learning Cubes community, the weaknesses of LearningApps are the following:

- can be used only online
- cannot be used for summative evaluation

II. Methodological Development in the Practice School of Eszterházy Károly University

Expanding the content of informal learning with Storyline Framework method

Andreas Schleicher, OECD Director of Education, presented the latest research findings: according to these, countries with the highest but a short-term use of computers have performed best in digital reading comprehension in PISA tests (8-12 minutes of use per lesson gives the best performance, more effective than teaching in a fully electronic learning environment).[26] Therefore, it is worth applying such methodological solutions to education that complement traditional education. Furthermore, if we want the acquisition of the curriculum to be more than just a one-sided transfer of knowledge, we should definitely try the Storyline framework method. Many teachers use this method during the implementation of a theme week or project, since the thread of the story provides an opportunity to develop imagination, maintain a continuous interest and understand the given theme. With this method, knowledge acquisition is an exciting process and students can become the main characters of the story. They can be in an instant decision-making position to achieve the main goal.

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[25] Estefánné Varga Magdolna and Dávid Mária, Supporting SEN Learners with ICT Tools, (Eger, Eszterházy Károly Főiskola, 2013) 125.

[26] Tünde Lengyelné Molnár, "Library Aspects of the Digital Switchover," *Scientific And Technical Information*, 66, 11. No., (2019), p.66.

This way, they face with the consequences of their decisions: as a result, they have a better understanding of the importance of the task. It also strengthens their sense of responsibility. They find themselves in a medium in which they become relaxed. They don't even realize that their initial constraints that often hinder their creativity are slowly but surely disappearing.

After having understood the Storyline Framework method, we tried to focus on the practical application.

Origin of the method

The original idea of the Storyline method comes from Scotland: when they faced with several problems of textbook-centered primary school education, a new national curriculum was born in 1965 suggesting a holistic approach. The different rates of development and interest of children were also taken into consideration. Two main subject groups came into existence: one combined environmental, science subjects including history, geography, mathematics, and natural science; the other area integrated subjects related to aesthetic and art education. Drawing, science, music and physical education were included in this group. With the introduction of the new system and based on curriculum changes, the Storyline Framework Method was developed by the Jordanhill College of Education in Glasgow aiming to facilitate the planning tasks of primary school teachers and educators.[27]

A Brief History

If we go back a little bit in time, we may remember that Johann Amos Comenius (1592-1670) had already emphasized the involvement of the senses and the importance of a positive learning environment in his famous work, Orbis Sensualium Pictus published in 1654. A little later, Rousseau (1712-1778) was already a pioneer in holistic education and individualistic pedagogy. Reform pedagogical trends emerged more than 100 years later, in the 1890s (New School, Montessori, Decroly: Ermitage, Ferrier, Steiner: Waldorf). Célestin Freinet encouraged to create a democratic atmosphere that promotes free self-expression, the conditions for cooperation between students and the development of a meaningful community life. (Freinet-pedagogy 1997: 540). The theory, originally appeared in the late 1920s, became known in Hungary only in the 1970s and then it became a movement in the 1980s.

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[27] Bell, Steve, "Storyline as an Approach to Language Teaching." *Die Neueren Sprachen*, Band, 1995.

Principles of Storyline Framework Method

According to the original plan, the main goal was to develop a method to create a motivating learning environment for our students.[28]

When designing the topic and the curriculum, the following principles shall be considered:

The story: The story provides a linear structure for learning and creates a connection between episodes and modules.

The premonition: A good story fills you with anticipation. We try to figure out what's coming next and we look forward to the future with joy and excitement. Students are also excited to see if it meets their expectations, what the next event will be about. The children are also taken by the story and they are eagerly waiting for the next chapter.

The role of the teacher: A partnership is created between the student and the teacher. The teacher is always in charge since the given material shall be integrated into the lesson. However, (s)he should be flexible because it is always a bumpy road with many curves and crossroads. Yet the student follows the path the teacher has carefully planned and, of course, also acquires the curriculum by the end of the story.

The possession: This is the strongest motivation. Students are proud and enthusiastic that they can participate in a work in which they are the main characters. They create their own story, tasks, problems and the possible solutions as well. They share their own ideas and prior knowledge because together they know much more about a given topic than they do individually: this is the essence of Storyline.

The context: New knowledge is always based on prior knowledge. The context ensures that students learn what we want to teach them. Content is often familiar to them because it depicts reality: therefore, links with real life situations are visible and understandable.

The plan before actions: Students first need to consider what they already know. This is necessary for them to be able to formulate the questions to which they seek answers. Constant support is needed to uncover missing knowledge that they can present to their peers later.[29]

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[28] Peter J. Mitchell and Marie Jeanne McNaughton, *Storyline: A Creative Approach to Learning and Tea- ching.* (Cambridge: Cambridge Scholars Publishing. 2016.)

[29] Creswell, Jeff, Creating Worlds, *Constructing Meaning: The Scottish Storyline Method.* (Portsmouth, NH: Heinemann, 1997.)

Domestic considerations

OFI was the first institute in Hungary that created a Hungarian guide the application of the framework method. The Storyline method became an accredited training in Hungary in the spring of 2015. The three-year joint creative work involved 4 base schools and nearly 50 related non-governmental organizations: as a result, 288 modules are currently available and 144 of them have already been tried and tested. In addition to these, ELTE PPK already offers an optional role-playing course and professional forums are frequently held as well.[30]

The use of playful, varied methods and tools plays an important role in the education of children who requiring special attention. It is especially important for them that the acquisition of the designated curriculum should not take place with the usual, dull methods and the transfer of knowledge should not only be one-sided.

As for effectiveness, Mária M. Nádasi and Antal et al. assert the following: The variety of methods used in teaching can make our work even more effective. I believe that students 'motivation is greatly supported by the use of tablets in the classroom. Therefore, in addition to traditional methods such as drama play, project method, etc. (M. Nádasi, 2010) innovations (Antal, Babiczki, Borbás et al., 2016) and new techniques are also needed."[31]

Applying Storyline among children with special needs

The Storyline - framework method is can be very useful for the education of children with special educational needs and also in therapeutic sessions.

In line with individual interests, the method can be freely used by special educators and development teachers as well.

The main point of the process is to develop such useful skills which are necessary in everyday situations: communication, cooperation, democratic expression of opinion – basically the weaknesses of children with special educational needs. This positive effect is achieved by placing everyday events into a frame game that combines drama, crafts and speech.[32]

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[30] Attiláné Mikó,"*Focus on Storyline*," (Eger: Sárospataki Pedagógiai Füzetek, 2018). pp. 258.

[31] Péter Antal, Tamás Babiczki, László Borbás, "Digital switchover in public education - Introduction and use of mobile communication tools in education," *Adaptive teaching and education* ed. Mária M. Nádasi (Budapest: Genius Books Hungarian Talent Helpers Association, 2010).

[32] Andrea Somogyiné Lakatos, Anikó Siteri, Judit Szakál, "EU Stars," *Introduction and Practice to the Storyline Method for Students with Special Educational Needs*, (Tempus Közalapítvány, 2008). 7.

When should we apply this method?

- Within the classroom
- During extracurricular activities – professional circles, projects, project days, catching up, talent management
- During free time activities - class trip, study trip, forest school, summer camps

Thanks to a maintenance project, we applied the Storyline Framework Method in our Practice School and the research was supplemented with Learning Cubes (LearningApps. org). The methodological development took place within the project called "Developing informal and non-formal learning opportunities in the Practice School of Eszterházy Károly University".

Methodological development at the Practice School of Eszterházy Károly University

Duration: Academic year of 2018-19.

Main goals of the project

- Creating informal learning opportunities through which we ensure our students' access to education.
- Developing extracurricular programmes to enable them to learn and develop their self-knowledge, motivation, and abilities.
- Increasing the efficiency and effectiveness of public education.

Main activities of the project

We mainly focused on methodological developments, the implementation of informal activities and the training of the teachers of our institution. In addition, professional work in the program was also introduced in the target group.

Impact area of the project: Practice School of Eszterházy Károly University and the Eger area

During the methodological development, we created teacher aids, manuals and student guides.

Methodological development in grades 1-4 of the Practice School of Eszterházy Károly University

In the lower grades, the methodological documents were developed according to the following topics:

English language, naturla science, Storyline – Learning Cubes, Crafts.

In these grades, we attempted to create an extracurricular program that complements school education: with these activities, the competence and skills of the students are developed in a complex way. More importantly, their self-knowledge, motivation and abilities were also developed in the programme.

Expanding the content of informal learning – Applying Storyline Framework method in professional circles

Created on LearningApps with Learning Cubes, the method has successfully been used for 2 years during extracurricular activities in professional circles. During the implementation of the project, the acquisition of (new) knowledge took place mainly with the help of manual activities and mathematically themed Learning Cubes.

Subject concentration during the activities: in addition to mathematics, drawing and technology, knowledge of geography, biology and physical education also appeared in activities.

Different teacher role

Enikő Gönczöl et al. assert: "The role of the teacher in the project is different from the traditional one. During the preparatory work, the main goal is to design the learning environment. During the learning process, the teacher shall moderate the whole process and provide communication and collaboration within the group. Basically, the teacher is not the source of knowledge. (S)he primarily helps students to link new knowledge elements to their pre-existing knowledge."[33]

Most crucial points the process:
- setting goals to be achieved

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[33] Enikő Gönczöl, *Research and Development Kaleidoscope* (Budapest: OFI, 2015).

- event planning - creating a schedule
- review of the curriculum to be processed
- having sufficient knowledge about students in professional circles
- mapping and arousing their interest
- creating modules
- designing feedback
- providing references and resources to the students.

According to Brigitta Balogh (1999) and László Tóth (2000): If a task deals with an interesting, real problem, the students will definitely be interested. Accurate knowledge of the goals to be achieved and continuous feedback on the achieved results also have an incentive effect on student performance. Positive reinforcement helps to strengthen knowledge while success increases students' self-confidence and commitment to learning.[34]
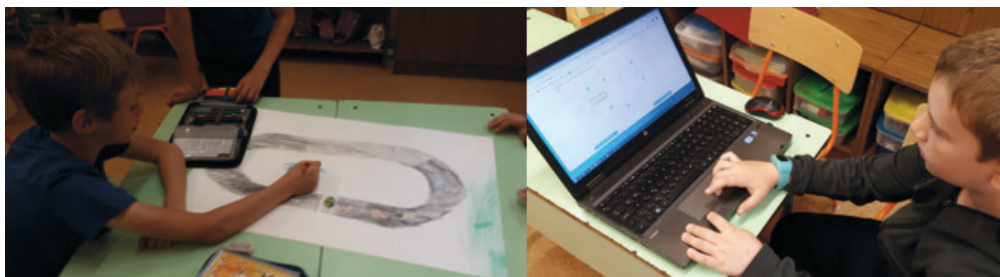

Figure 14. Activities (courtesy of the authors)

Third grade students of the Practice School participated in the activities. **Children requiring special attention** also took part in our research. We paid more attention to them during the project.

In the case of children requiring special attention, it is important to ensure equal rightsand opportunities. We placed special emphasis on their inclusion and acceptance.

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[34] Brigitta Balogh, "School motivation," *A Guide to the Professional Psychology Practice of Students of Teaching Major* ed. Balogh., Tóth L. (Debrecen: Lajos Kossuth University, Department of Pedagogy and Psychology, 1999) and László Tóth, "Motivational Charac-teristics of Students and School Performance," Chapters from Pedagogical Psychology ed. László Balogh., László Tóth. (Debrecen: I. Kossuth University Publishing House, University of Debrecen, 2000a) 247–255.

The impact of common activities on students requiring special attention

They really enjoyed creating something independently and the relaxed atmosphere meant a lot to them. The activities carried out during the project provided an opportunity to relieve tension. Boredom and anxiety were replaced by interest. The feeling of success during the sessions made them feel the sense of a community.

Brigitta Balogh emphasised that the latest studies have shown that there is a correlation between interest and school performance.[35] Unfortunately, disabled children have little success in their everyday lives and they encounter failure in many areas of life. Brigitta Balogh (1999) and László Tóth (2000) assert that during school work, students encounter both success and failure. This influences his/her future performance and behaviour: to be able to cope with failure, they must understand the reason behind these events. According to high-performing learners, success is the result of the skills while failure is seen as a lack of effort. Low-performing students consider success as the result of some external cause while failure is caused by ability deficiencies or bad luck which can lead to high levels of anxiety. [36]

During the project, it was nice to see that they have strong ownership of the project. The more opportunities we give them to engage in everyday life, the less they feel disabled. A positive relationship with their healthy peers is important to them and they prefer to open towards their healthy mates.

The children were feeling relaxed during the sessions and they were having fun in the company of their peers and teachers. Each time they arrived with a smile and they were happy to attend the classes. During the group sessions, they were able to work effectively paying attention to each other.

Working together with a common goal, communication, the application of different artistic techniques, the experience of success, the feeling of creation – all had an impact on the personal development of our students.

Goals for children requiring special attention:
- to participate in the sessions voluntarily and happily
- to engage in activities for a long time without compulsion,

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[35] Brigitta Balogh, "School Motivation," *A Guide to the Professional Psychology Practice of Students of Teaching Major* (Kossuth Lajos Tudományegyetem Pedagógiai–Pszichológiai Tanszék, Debrecen, 1999)

[36] Brigitta Balogh, "School Motivation," *A Guide to the Professional Psychology Practice of Students of Teaching Major* (Kossuth Lajos Tudományegyetem Pedagógiai–Pszichológiai Tanszék, Debrecen, 1999) and László Tóth, "Motivational characteristics of Students and School Performance." *Chapters from Pedagogical Psychology* (Kossuth Egyetemi Kiadó, Debreceni Egyetem, Debrecen, 2000) 247–255.

- to use the tools properly during a manual activity, to learn about different representation techniques, to have a variety of colour usage,
- to strive for cooperation with their mates, to have proper communication, to develop their vocabulary,
- to be able to work, evaluate each other's work and form an opinion using various techniques during manual activities,
- to develop their creativity, self-esteem and self-knowledge, their social, emotional and digital competence, their problem-solving ability, their fine motor skills.

Storyline as a method

The Storyline Framework is an effective teaching method that can be used outside and inside the classroom as well. The method focuses on a frame story.

It is an experiential, exploratory form of teaching, providing the acquisition of new knowledge, repetition, and series of feedback.

Features of Storyline method:
- Knowledge transfer takes place in an integrated way
- Brings together different subjects in one topic
- The student has autonomy during the process
- Learning organization is characterized by individual-pair and group work
- Active and productive task
- Affects key areas of competence (social, communication, etc.)
- Develops creativity
- Promotes the use listening comprehension and reading/writing
- The use of reference material.

Frame story

The frame story contained episodes. Each episode had a problem to be solved: it was completed with the help of manual activities and math-themed Learning Cubes.

In addition to the subjects of mathematics, drawing and technology, we strived to include geography, biology and physical education in the acquisition of knowledge. They were happy to come to the sessions, they were "just" painting, creating and playing. They did not even notice that they acquired new knowledge in the meantime.

Duration of the episodes: 90 minutes.

The main characters of the story were the 3rd grade students of the Practice School. They dreamed of an island for 16 episodes and then they planned and created the island during the school year.

Each episode began with a key question: our students had 90 minutes to find a solution to these questions. During the sessions, students were guided through these key questions. The questions were interesting and motivating for them: these questions significantly fostered their motivation towards the topic and the tool.

EFOP-3.3.7-17 Informális és nem formális tanulási lehetőségek kialakítása a köznevelési intézményekben

A kerettörténet: A sziget fővárosa, programok tervezése - Írásbeli műveletek végzése - Írásbeli összeadás, kivonás 1000-ig - Írásbeli szorzás egyjegyű szorzóval

Modulsablon:14.

A kerettörténet epizódcíme	A kulcskérdés	Tevékenységek	Szervezési feladatok, munkaforma	Szükséges eszközök	Létrehozott termék, eredmény, alkotás	Értékelés, feladatok	Pedagógiai cél, tananyag tartalom
1.A főváros élete - Programok a fővárosban	(10 perc) Milyen lehet a sziget fővárosa?	Hogyan képzelitek el a főváros életét? Milyen lehet itt élni? Milyen programokban lehet részük az itt élő embereknek?	irányított beszélgetés, frontális munka				programok gyűjtése, szókincsfejleszt és
	Melyik osztályba mennyi a tanulók testtömege illetve magassága? (30 perc)	Négy – öt csoportban dolgozva megtervezik a legjelentősebb programokat. Tervezés után rajzoljátok meg ezeket!	csoportmunka egyéni munka	ecset, tempera, csomagolópap ír, vízfesték	A főváros programjai nak megtervezé se		ismeretek megosztása, együttműködés, csoportkohézió fejlesztése, vita-érvelés

Figure 15. Module Template

We ensured that the acquisition of knowledge should be included in each episode: it was made more effective by the use of ICT tools and the integration of practical activities. We tried to create back-to-back episodes for the children taking into account the age characteristics of our students.

During the episodes, our children were encouraged to find the answers themselves. To be able to reach the goal, we made them face with problem situations that they had to solve together with the help of their own knowledge and different sources of information.

Knowledge was acquired in a playful way and they applied their prior knowledge as well. In addition to non-stop interaction, they were able to participate in an active learning process.

Knowledge transfer took place in an integrated way using different forms of work. In the project, students acted autonomously focusing on different subjects in one topic.

During the acquisition of knowledge, new things were discovered and both students and teachers were having fun.

Main phases of the frame story method:
- formulating a question, raising the problem together,
- creating a story of episodes,
- selecting and creating locations and characters,
- discovering the relationships and background story of the characters,
- creating rules,
- problem raising,
- seeking solutions,
- systematisation of the knowledge gained during problem solving,
- self-assessment,
- evaluating each other's work,
- organizing and presenting products, closing ceremony.[37]

Introducing the topic – Creating a Learning Cube Island

To introduce the topic, we took our students to an imaginary uninhabited island. With their eyes closed, they told us what they could see. After sharing their experiences, the imaginary ISLAND was created on the cardboard placed right in front of them.

It was good to see they could see the island right in front of them; they put themselves in the role of the saviour, and then, with the help of their imagination, they continued the story, came up with ideas and had some thoughts.

The frame story around which we created the episodes

It is important to give an interesting, logically structured story that is easy for children to follow. The theme should be appropriate to their age. It should arouse their interest and their contribution should be a good experience for them. The characters and the plot should be presented separately and the topic should be clear to the children.

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[37] Attiláné Mikó, "Focus on Storyline," (Eger: Sárospataki Pedagógiai Füzetek, 2018). 260.

By placing the curriculum into everyday practice, the framework story facilitates the process of learning and helps the understanding process.

Our frame story:
The inhabitants of Cubeland got into a big trouble because the continent where they live was constantly flooded.
We need to move the people living there to an uninhabited island!
We need to design this island so that the people living here can have a good time.

During the 16-episode course, we were planning the island, the number of people living here and the animals and plants as well. We were designing the topography of the island and installing cities and villages on the island.

We also designed the first school, the first means of transport and the main programs on the island. We created an exciting cycling race at two locations and some buildings at the site were also designed.

The fascination of working together

The plot of the story was elaborated together and in most cases the children's ideas and creativity helped to solve the problems. We tried to accept the ideas and pieces of advice of all participants. We managed to build a cohesive community relatively quickly. In this community, they could really have fun and their sense of responsibility also improved.

Each time the students felt usefulness and the feeling of success was never lost as they acted in a playful way through their own experience.

Forms of work during the sessions

During the school year, our students worked individually, in pairs and in groups. Group and pair work were the most popular forms among them.

Figure 16. Group work (courtesy of the authors)

At first, it was difficult to accept each other's ideas and advice, but this problem has finally been resolved.

To be able to know and accept each other in common activities, we tried to rotate the members of the given groups. Eventually, they enjoyed common experiences and the different topics. The students always completed their tasks happily and they enjoyed every minute of it.

Subject concentration in the sessions

During the sessions, we taught the inhabitants of the island to count and we also installed animals and plants on the island. We determined the location of the island, designed the topography and the first school of the inhabitants. By using several subjects, we ensured that the acquisition of knowledge took place in a complex way.

Manual - practical activities during the project

Manual activities included drawing, painting, plasticizing, patterning, printing and coloring. We were also cutting, glueing and we were all happy with the finished workpieces. These activities are also important tools for children's personality development. These also develop their imagination, strengthen their self-confidence, self-expression and aesthetic sense.

Figure 17 Manual activity (courtesy of the authors)

Teaching aid - Use of Learning Cubes in classes - Development of digital competence

Learning Cubes were also used during the project as it was fun to arrive on the Learning Cube Island with smart tools.
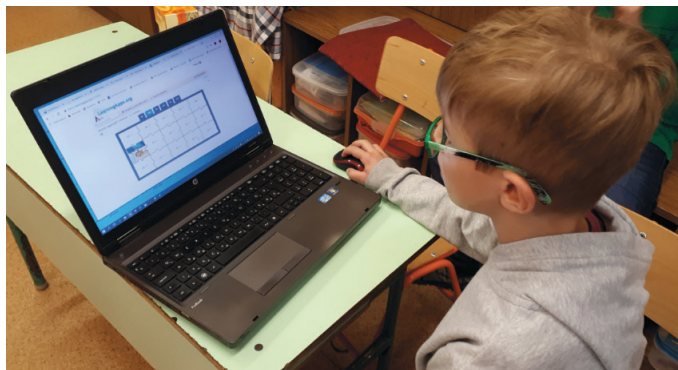

Figure 18. ICT-supported activity (courtesy of the authors)

The various forms of Learning Cubes made the processing of the curriculum more interesting.

By solving these, our students learned by playing and they did not even notice that they finally solved a mathematical problem. Learning Cubes helped to transfer and acquire knowledge and they developed digital competence by providing the experience of learning

together in a playful environment. During the processing of the story, we were using tihs platform to make the session more colorful and enjoyable for them: on the other hand, we could display texts, images, audio or video details within the series of Cubes and several sensory channels of the students were stimulated as well. The joint inclusion of theoretical and practical knowledge during the sessions increased student activity and motivation. The common experience, the introduction of the new method was crucial especially for children in need of special attention.

Before using digital devices, we drew the attention of children to a few important rules.

Rules of using digital devices:
- I respect and take care of digital devices!
- I put the device back to its box after use!
- I do not use it without permission and I don't install other applications on it!
- If I notice a technical problem, I tell it to my teacher!
- I am constantly checking the battery level: in case of a low battery, I tell this to the teacher!
- I clean the screen after use!
- When I have finished my work, I will shut down the digital device properly and put it back in its place!

Evaluation during the project:

During the sessions, we took some pictures of the working process which helped our work in teacher and student evaluation. These were extremely helpful giving us a great opportunity to provide feedback and assistance.

Student groups got constant feedback and common interaction which created a constructive and helpful evaluation and assistance. Our teachers were encouraging and they tried to provide a positive and supportive atmosphere during the sessions.

According to Balogh Brigitta: For students, the recognition and praise of a teacher is a huge motivating force especially if the teacher is committed to his/her work and enthusiastically performs his/her task. [38]

At the end of the project, the works of the sessions were exhibited and the year was evaluated and summarized together.

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[38] Brigitta Balogh, "School Motivation," *A Guide to the Professional Psychology Practice of Students of Teaching Major* (Kossuth Lajos Tudományegyetem Pedagógiai–Pszichológiai Tanszék, Debrecen, 1999)

III. Summary: Long-term goals

Learning Cubes

Results of the group:
The application and the Storyline frame story method had been unknown for our students. However, learning by playing in a digital environment immediately became attractive to our students requiring special attention. The introduction and use of new methods have increased student motivation and LearningApps was even used as a home practice. Their learning results have improved and our students have become active users.

Storyline – Framework

The children were happy to attend the classes. They improved a lot especially those children who need special attention. The relaxed, cheerful and balanced atmosphere had a positive impact on the students. As a result of the introduced method, their motivation increased and their study performance and attitudes towards learning also developed.

They were sad when they learnt that the project came to an end. During a closing ceremony, the products were organised and presented: we found a name for our island adn we had a brief celebration.

The methodological aids (topics, teacher's manual - lesson plans, student aids) were created by the teachers – these were tested during the school year.

Teachers and students were fortunate enough to get acquainted with this effective teaching method which was completed in a classroom environment during the project. This experiential, exploratory form of teaching has become a part of our lives and we are all looking forward to continuing. Our goal remains the same: to be able introduce similar innovative methods in education and to help children in need of special attention.

Results of the teachers:
One of the biggest challenges for the teachers in the 21st century is the development of new teaching methods, ICT tools, teaching models, dissemination of good practices and research on student performance.

The number of teaching aids, new methods and tools is continuously increasing and, at the same time, more and more teachers are learning to apply them in their daily work. However, several questions arise about the use of these tools. Our goal is to apply further innovative methods in education and also to expand the literature of the LearningApps

tool with the results of ongoing research. Long-term comparative studies with applications such as LearningApps.org are also planned in the future.

Experiences of digital education, the use of the application in online education:

On March 13, 2020, the digital education format was introduced in Hungary and it could be described in 3 words: online connection, ICT tools, new methods.

From 16 March 2020, a new educational format entered into force in schools. Teachers had to response quickly to the new situation. They had to continue teaching with digital tools. They shared their experiences, ideas, and digital curricula with each other. Within days, the transition to digital education has taken place nationwide.

Several studies in 2020 claimed that, in addition to the framework and video tools, teachers preferred platforms and tools used for assessment and practice. They mainly chose LearningApps, and Learning Cubes. During the digital education format, LearningApps has been one of the most popular applications among teachers, children and their parents.

From March 13, 2020, we have been constantly checking the LearningApps Facebook page.

We learnt that the number of users increased significantly and the platform became immediately overloaded. Accordingly, the developers provided only limited access to Hungarian users and expanded the server infrastructure of LearningApps.org.

The following functions have been deactivated: the search box and the statistics button. According to Dr. Michael Hielscher, President of the LearningApps Association, during the first 4 weeks, more than 100,000 users participated online at LearningApps.org in Hungary.

From March 16 to April 13, 2020, about 130,000 new people (40,000 teachers, 90,000 students) registered on the site. According to Dr. Michael Hielscher, these are only "registered" users since most students are not logged in with their own account.

According to the data of the LearningApps-Team (development team of Dr. Michael Hielscher) as of April 13, 2020: 500.000 registered users – 200.000 teachers and 300.000 students used the application in Hungary.

Based on the numbers, we were curious about how popular the application is among teachers and how often (and basically how) it is used by them.

A questionnaire titled "The use of Learning Cubes in Digital Education Format" measured the use of Learning Cubes between 5 May and 13 August 2020. It is available on the LearningApps platform as a hyperlink.

The aim of my research was to learn how Learning Cubes are used by teachers. The research was crucial to get relevant data about the use of Learning Cubes in digital education.

A limited number of studies on such an educational tool have been published In Hungary so far. Data evaluation is currently in progress and these will be included in my doctoral dissertation.

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