

# USE OF MOBILE APPLICATIONS IN PRIMARY EDUCATION THAT PUPILS CAN USE AT HOME

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## ABSTRACT

Nowadays, children are constantly surrounded by mobile technologies. Children use them from an early age. Some teachers perceive them negatively, but they can assist in teaching if we use them appropriately. This work presents findings of some possibilities for using mobile technologies, especially the applications in teaching in primary education and the applications usable at home. The applications usable at home can motivate pupils and in these days of quarantine is very needed. The chapter focuses on the educational potential of applications usable at home for support in primary education and how the teacher can evaluate children using these applications. The chapter presents the opportunities that educational applications brings to primary education. The author gives a brief overview of selected applications suitable for primary school children. They then focus on Socrative, Kahoot and Toglic which were used in Primary school in each grade. We will also present a proposal for this research – experiment. We will focus on its possible objectives.

## KEYWORDS

*Mobile applications, digital technology, primary education, creativity and competences of a child.*

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## 1 INTRODUCTION

Nowadays, digital and mobile technologies are part of the everyday life of children in both pre-primary and primary education. Sociologists classify children born after 2000 as the Generation Z. Other experts date Generation Z from 1994 to 2004 and any children born later belong to the youngest Generation Alpha. The term Alpha was coined by Mark McCrindle. He said that last children who will still belong to this generation will be born in 2025.

Joanne G. Sujansky and Jan Ferri-Reed (2009) wrote their book „Keeping the Millennials“ that young people have an ability of multitasking. It means that they are able to work on a computer, watch TV, listen to music and write messages at the same time. It is essential that pupils in pre-primary and primary education know about possibilities of using smartphones and other technologies. It increases their digital literacy. Ulrich Hoppe said that technology creates new conditions for learning and new ways of learning can arise.

Ivan Kalas (2010) said that ICT can also help children do many of things. Information Communication Technology can serve as the environment and tools for the development of a child. We should encourage young children to apply ICT tools for their own purposes in their play.

Most educational experts agree and believe that digital technologies can support pupils competence development. Majority of digital researches have confirmed these discussions and have found that new

technologies impact children's lives significantly. On the other hand, there are studies warning about various risks that need to be considered. Most of these doubts are based predominantly on the misconception that modern technology in education makes pupils passive receivers or lonely computer game players. For using digital technologies in pre-primary and primary education, it is necessary to determine the digital product suitability and adequacy with respect for children's age, select carefully appropriate applications and place them into constructive digital environment/context.

Sylva and Siraj-Blatchford (2006) identified four key areas of learning in Early Childhood Environments (ECE). It is the educational theory section about learning (formal and informal) young children under the age of 8 and it reflects how and in which areas ICT can support them.

They are:

communication and cooperation – they appear naturally in collaborative problem solving – applications based on experiments with programmable toys

creativity – children have to acquire schemes and need playful dispositions to try these schemes in a new context to be creative

sociodramatic play – there is a lot of space to integrate ICT into the playing young children environment

learn to learn – there is evidence that computers help young children think of thinking.

Constructivist teaching approaches and pedagogical research concerned with the application of this theoretical direction to teaching have often been an interest of researches (e.g., Bodner, 1986, pp. 875–876; Held, Pupala, & Osuská, 1994; Renström, Andersson, & Marton, 1990; Žoldošová & Prokop, 2007). They deal with basic questions of science principles of using Augmented Reality in primary education. This trend in research has found continued motivation, both abroad, because children often use only rote memorization as their learning technique without gaining any in-depth understanding of subject's essence (Tóthová, 2014).

Arnheim (2004) argued for the unity of perception and abstract thinking, according to which mental processes do Augmented Reality Applications in Early Childhood Education not only consist of operations with words and numbers, but also imaginary thinking.

## **2 LIST OF APPLICATIONS USABLE AT THE LOWER SCHOOL LEVEL AND USABLE AT HOME**

Now, when the schools are closed, many companies are trying to help parents who have to educate their children at home. Teachers need to adapt their teaching to the current situation. In Czech Republic there are many web sites that are useful and suitable for home exercise. List of them:

[www.skolakov.eu](http://www.skolakov.eu) – children can practice Math, Czech, English and Science, practicing is on this website using the game

[www.matika.in](http://www.matika.in) – children can practice Math (the Hejny method, where pupils orient in several mediums)

[www.onlinecviceni.cz](http://www.onlinecviceni.cz) – children can practice Math and Czech

[www.umimecesky.cz](http://www.umimecesky.cz) – children can practice Czech

[www.grammar.in](http://www.grammar.in) – children can practice Czech, there are many games

[www.zlatka.in](http://www.zlatka.in) – children can learn and practice the financial literacy

[www.naberanku.cz](http://www.naberanku.cz) – children can practice Czech, Math, English, Music

[www.e-skola.zolta.cz/vyukove-aplikace-online/](http://www.e-skola.zolta.cz/vyukove-aplikace-online/) - children can practice languages and Math

[www.vyukovematerialy.eu](http://www.vyukovematerialy.eu) – children can practice writing, reading, Math, Science, Music.

[www.mojecestina.cz](http://www.mojecestina.cz) – children can practice Czech (3 – 5 grade)

[www.zssm.cz/dokumenty/online\\_zdroje.pdf](http://www.zssm.cz/dokumenty/online_zdroje.pdf) - in this list we have all important websites usable in primary school

[www.khanovaskola.cz](http://www.khanovaskola.cz) / [www.khanacademy.org](http://www.khanacademy.org) – in English – these websites contains a tutorial videos

Subsequent applications were tested in teaching in 2019/2020. We chose some which can be applied suitably at primary school and at home.

**Quiver** - Quiver App combines physical coloring with state of the art augmented reality technology. The Platonic Solids is a part of the Quiver educational application. We can visualise Platonic bodies by it. Pupils at the first level can get to know formations in three-dimensional space and, for example, look for the geometric shapes which they already know - square, triangle. This application is suitable for mathematics, but by using other printable worksheets, it is also applicable to natural sciences. Therefore we use the STEAM concept.

**Socratic** – Is an App but can also be used on web site. Students answering formative assessment question in a variety of formats – answering can be by select right answer or write word or sentence or choose yes or no. Teacher immediately sees the child's answers so can evaluate it. The App is separately for teachers and for students. It can be used for any subject.

**Kahoot** – This App is also usable at home. It is a motivating application where pupils can practise any subject. The quizzes are created by teachers or they can choose from quizzes in the storage and teachers see the results of children then. Children see their classmates doing and it can motivate them to work better. Disadvantages are that there is no possibility to react as the teacher (feedback or rating). It is more like game but game with practicing curriculum.

**Toglic** – is a website where you will find a tool with which you can easily create interesting teaching activities that you will use in teaching at the 1<sup>st</sup> and 2<sup>nd</sup> grade of elementary school. You can create individual activities quickly and you can choose from a set of 15 interesting learning activities. For the children it is intuitive and easy. It can be use for many subjects.

**Padlet** – is a digital blackboard to create projects that are easy to share with children or parents. Children can upload media here (video, photos, recordings, documents). We use this application for uploading homework during home teaching. Pupils simply upload a file and the teacher can comment and rate it. Other children also see the work from others. It can be used as an application or website.

**Seesaw** – is the best platform for children to share their learning. Each child has their own portfolio, where they can upload any medium and the teacher can write and evaluate them. Parents also have access to the child's portfolio, so they see the work that pupils do at school. Now in home education, this application is used a lot when submitting work.

**Google meet** – it is very easy for online education. Anyone can join a meeting on Meet if they have got a link. The call is unlimited and can be attended by up to 250 participants. The teacher can turn off the pupil's microphones and simply record the lesson or share the screen.

### 3 ACTION RESEARCH

The action research took place at the Elementary school and Kindergarten in Ludgeřovice, where I have been teaching the first level pupils for four years. We use technology mainly for repeating curriculum, and also for pupil motivation. The school has 120 iPads, Dash and Dot robots, Ozobots, Lego Mindstorm, Beebots and Micro:bits that are used by teachers in their classrooms as needed. There is also a class of iPads in education, where we do more advanced work with iPads and robots. From kindergarten and at the first level (1st - 2nd class), we begin to program Bee-bot called “robotic bees”, which are very intuitive and simple. Then we follow to program Ozobots (3rd - 4th class), which are programmed by colour combinations or by programming language on a PC or iPad. We use Dash and Dot robots in the 3rd class by using simpler applications and we build codes in the programming language with older pupils in the 4th and 5th classes. With robots we start using iPads from the first class, which pupils have in the classroom 1: 1.

In 2020 we did action research in the 1st class at the first level at Elementary School in Ludgeřovice. There were 23 pupils in the class. Because of quarantine in the Czech Republic we focused on children’s work at home with modern technologies. Pupils had experiences with iPads from school and were able to control them.

We determined a research problem:

**What is the function of online applications in teaching at home?**

Research questions we focus on in this text, are as follows:

**Do online applications motivate children in school preparation at home?**

**How students showed their motivation by online applications?**

**What parents see as positive about online applications?**

Technique of collecting data were depth interviews method with teachers and children and video recordings from online lessons used by Google meet. The conversations were recorded using Google meet. Based on this coding, we identified key categories and these categories we began to descriptively process in detail. By using the qualitative research method – observation and case study - was found following information for several used applications and websites. The case study is here usually presented as a strategy allowing a detailed interpretation of all the factors involved in the case. The keystone is collecting. Almost all known techniques are commonly used in case studies data collection. Questionnaires, interviews with the main actors, all of them are used forms of observation and analysis of key documents. Each research report includes a methodological chapter which: it actually describes what we did during the research and why. The basis of the case investigation must be the collection of real data relating to the research object (case). It is always important that in the case study the researcher strives for a comprehensive understanding the case in its natural environment. The aim is to interpret interaction between the case and the environment. To complete this task requires obtaining large amounts of data from a variety of sources. From this point of view case study is a real research strategy and not a single technique. The researcher uses more information sources and all available data collection methods. The data is based on a systematic comparison and search periodicity segment into a system of categories. The emphasis is on the graphic representation and creation of case relational networks.

## Coding

Different words or phrases can be used to create code names. The aim is to make the names comprehensible to research and describe its way of understanding the concrete section. As codes can be used common words, technical terms or so-called vivo codes, which are quotes from statements of respondents that capture the meaning of the section.

### Apps used during quarantine:

In the research we observed pupils in the digital environment of certain applications. We observed their behaviour during using applications, whether they were motivated by their work and parent’s views on what they think about teaching online.

Mainly we use applications during our online meetings with kids, which are – Socrative, Kahoot and Toglic. It is because it can be use on the website. Not all students have iPads or smartphones with the possibility of installation application. Pupils practice the already discussed subject with these applications. Parents do not help them, so they are more independent. From the pedagogical point of view, working with these applications after or during online lesson, is motivating.

Pupils worked with one application once a week in each subject. They had not known before which information was supposed to be brought by application. They worked with this application for about 15 minutes, after each start each pupil had a different answers that they could do this test more times. After work with these applications, the teacher sees the student’s results and then in the online lesson he knows which subject to practice. After all outputs, the pupils and I discussed about curriculum. This application helps pupils with practice the curriculum and motivate them for next learning. Application Kahoot show them continuous results of other pupils so they were motivated and try it more times.

Show Names       Show Answers

| Name ↑      | Progress (%) ↓ | 1    | 2   | 3    | 4    | 5    | 6    | 7    | 8   |
|-------------|----------------|------|-----|------|------|------|------|------|-----|
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | C   | A    | A    | B    | B    | C    | B   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | B   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 0%             |      |     |      |      |      |      |      |     |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| *****       | 100% ✓         | B    | B   | A    | A    | B    | B    | C    | A   |
| Class Total |                | 100% | 93% | 100% | 100% | 100% | 100% | 100% | 86% |

Figure 1 Results Socrative

## CASE STUDY – ELABORATION

The case study for data acquisition was used as a research method. A case study is a focusing on a group of pupils and in the subsequent observation and description of all relevant aspects its behaviour or development. This group of people communicate with each other in the form of group interview. The main method of qualitative research was an unstructured observation. It means the observer minimizes interaction

with pupils. By observing we can see the creativity, motivation, digital literacy and independence through online applications. We used a direct observation - observation of communication among pupils and also an indirect observation - observation of real situations during online education.

**Research implementation** - data collection was realized during an action research with pupils in the 1st class at the Primary school in Ludgeřovice in Czech republic in 2020, in which 23 pupils participated. By using the online meet, pupils were expected to be more open and to share their views more easily. The teacher was here as a guide, asking questions and encouraging children to answer them. At the beginning of the online meet, the teacher challenged pupils to answer the questions and to share their opinions and remarks. The questions were: „What did you like most when we were using apps (Socrative, Kahoot, Toglic)?“ „Do you think you learned something interesting?“ „What surprised you?“ „What did you not like?“ „Would you like to do it during other online meetings or subjects?“

We used a recording during online meet with pupils and we have test results. The pupils answered and reflected on their work with the application during 15 minutes of the lesson. These records were then transcribed to a written form. The transcript was written as open coding and individual categories were created. (Tab.1) We obtained the main ideas expressed by a specific sentence (concepts), which were categorized in the statement protocol.

We performed observation of the action research at the Elementary school in Ludgeřovice between March – May 2020. The observed pupils were from 1st class. There were 23 children in the research. The aim of the unstructured observation were proceedings of the teaching process via his/her teaching, the teacher began to consciously support the pupil’s digital literacy development through applications on Ipads – during October 2019 - February 2020.

The pupils worked individually. They participated in achieving of the same goal through their activities, but also in fulfilling their own individual goals. Pupils shared their experience with others. They communicated over the images and questions without realizing that this way they were learning. Direct and indirect observations were registred to a written protocol (see Table 2).

By indirect observation we searched for the presence of a phenomenon - its occurrence, in which situations it occurs and how often it occurs. Pupils showed their commitment and motivation by repeating tests and quizzes. They tried it again until they got the right result for all the answers. Also, 100 percent participation in quizzes and tests is a sign that testing is motivated by children. When teacher sent the worksheet and the quiz, the quiz was more successful because the children wanted to talk about it and want to share the results.

During the analysis of pupil’s statements, all statements were included to search for an insight in how to use best the possibilities of the applications (Kahoot, Socrative, Toglic) in the online teaching process. Through using open coding the process of data exploring, comparing, categorizing, coding and conceptualizing was implemented.

**Table 1** Statement snippets of pupils

| Statements  | Codes |
|---|-------|
| I liked when I used PC during lessons.                                      | MF    |
| I liked when the teacher sent me a Kahoot code to practice.                 | TR    |
| I liked when I see how practice other classmates. I want to be better.      | CHP   |
| I learned to work with tablet more.   | CHP   |
| I tried tests more times if I have got some mistake.                        | CHP   |
| I did not learn, I rather played on tablet.                                 | MF    |
| I hope we will use these applications more at school.                       | MF    |
| If the test was from reading-book I had to read it more time.               | TR    |
| It is better than writing.  | MF    |
| I liked it.   | MF    |
| I have a mobile phone and it is so small for test, my mum prints it for me. | TR    |

**Table 2** List of identified categories, concepts and codes in the protocol.

| Interpretative category     | Concepts   | Codes |
|-----------------------------|--|-------|
| Child's performance         | The child is improving his / her potential and abilities.                            | CHP   |
| Teaching methods and formes | Individual work. Working with tablet.  | MF    |
| The teacher's role          | Teacher as an advisor, an observer.<br>The child gets information in different ways. | TR    |

We had an online meet with parents. The teacher was here as a guide and asking questions. At the beginning of the online meet, the teacher had questions to them. The questions were: „What is positive when your kid using application during lesson (Socrative, Kahoot, Toglic)?“ „Do you think your kid learned something interesting and new?“

We used a recording during online meet with parents. These records were then transcribed to a written form. The transcript was written as open coding and individual categories were created. (Tab. 3) We obtained the main ideas expressed by a specific sentence (concepts), which were categorized in the statement protocol.

**Table 3** Statement snippets of parents

| Characters we observed                               | Statements  |
|--|---|
| How online applications motivate children at home.   | <p>My son always sees such online tasks as a reward and enjoys it.</p> <p>He enjoys everything, but most work on the tablet. It could be more.</p> <p>I like that points are collected in applications, so the child does not give up in the middle but completes the whole test.</p>   |
| Function of online applications in teaching at home. | <p>It is good that practicing on the iPad isn't much and it's connected with the curriculum.</p> <p>The advantage is that I don't have to sit with my daughter for applications, she manages it herself and the results are immediately visible to her and the teacher.</p> <p>These applications are mainly for practicing, children love it and motivate them.</p> <p>It is very easy for use these applications.</p> |

## CONCLUSION

At this time, digital technologies are a desirable tool in education. They are not only an excellent motivational element, but they can also influence several senses of pupils at the same time, and, in that way, instil the curriculum more permanently.

The research aim was to create a model for didactic support to develop digital literacy of children in primary education through online education. The main aim was to find out the impact and benefits of online applications on development of children's digital literacy. The online applications contribution in the area of the children's digital literacy development was significant among the pupils. While children were playing with tablet, a high level of engagement and motivation were observed.

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