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Optimization of Achievements Assessment of Preschool Children Using A Virtual System

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Abstract

In this article authors present assessment system of preschool children achievements in Lithuania, present the teacher's opinion about achievements assessment description of preschool children. This article presents the recommendations for children's achievement assessment optimisation using virtual systems. The applied qualitative research using individual interviews, a total of 7 preschool education teachers and managers from Klaipeda region. The results: optimization of implementation of achievements assessment description of preschool children to using virtual system of description; rationalizing and allocating the cost of labor in the teaching process; better education planning process with regard to children's individual needs and abilities, which are determined in virtual system of children's achievement assessment.

Keywords: Preschool children, achievements assessment, optimization of assessment, virtual system.

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Introduction

The Republic of Lithuania as well as other European and world countries and global organizations are striving for the social welfare, development of education system and quality of education for the new generation. The strategic documents and resolutions, welfare concepts, programs and specific methodologies are being passed. Information and communication technologies play an important role in all spheres of life, including education and early childhood education.

The Policy brief of UNESCO Institute for Information Technologies in Education (2012) state that Educators and politicians are much more interested in understanding a role of information and communication technology, or technologies (ICT) in promotion of (Early Childhood Care and Education - ECCE) children's achievements. Unfortunately, little in the way of systemic research and review has been carried out in this area. At present, there is still a lack of those researches, as the situation is constantly changing, ICT tools are getting better, and the number of users is growing.

ICT is moving into the sphere of early education extremely rapidly. One of the ICT tools for educational institutions is a virtual system (VS). The use of virtual systems in a work of teacher opens up new opportunities for improving the educational process, by developing close cooperation between teachers and parents, rapidly exchanging relevant information with colleagues, constantly monitoring and documenting children's achievements.

The assessment, documentation and information on the achievements of a child are being researched by many foreign and Lithuanian scientists: Indrašienė, Žibėnienė (2014), Žukauskienė (2012), Gaižauskaitė, Valavičienė (2016), Diamond, Justice, Siegler, Snyder (2013), Boyd (2011), Brenneman (2011), Brassard, Boehm (2007), Alasuutari, Markstrom (2011), Gerde, Schachter, Wasik (2013) and others.

The researches on the use of ICT in early childhood education is also carried out by a number of researchers: Stephen, Edwards (2018), Plowman, Stephen (2005), Blamires, Reardon, Hammond, Church (2015), Kerckaert, Vanderlinde, Johan van Braak (2015), Palaiologou (2016), Edwards (2013) and others. However, ICT is usually referred to as a hardware: stationary, portable computers, tablets, interactive whiteboards, screens, tables, floors, etc. or programs: task sets, digital games, smart toys, etc. However, detailed researches detecting the use of ICT tools, such as the virtual system, for evaluating, documenting and communicating children's achievements have not been traced.

The stages and course of the research. This article presents the second phase of the research. In the first stage a quantitative survey was carried out. 130 Klaipeda region preschool education specialists who work in kindergartens, participate in the implementation of education and carry out an assessment of children's achievements were surveyed. The study was presented at the International Conference and published in the scientific publication (see ...). The research found out that educators mainly use documentation schemes created by their institutions or themselves while assessing children's achievements. These schemes are prepared according to the Preschool Children's Achievement Program (2014) approved by the Ministry of Education and Science. It has been identified what methods and means teachers use to assess children's achievements, by what means and how many times they do it. The research revealed what, according to the teachers, has changed in their work upon the introduction of the Description and how the assessment and documentation system should be optimized. Based on this research, a model for assessing and documenting the achievements of preschool children has been developed (Ramanauskiene, Norviliene 2017).

While creating the model assessing the achievements, it was observed that it would be the most convenient for teachers to use a virtual system that would enable them to include not only comments, summaries, fix the progress of each child, but also save the material illustrating those achievements: video material of assessment process, pictures of children's handicrafts, etc. It would be convenient to introduce achievements to parents and to integrate them more successfully into the process of assessment of learning and achievements. Thus, in order to achieve the intended results of the research, the research process was adjusted – in the second stage of the research it was foreseen to examine the prevalence of the use of ICT and virtual systems (hereinafter referred to as VS) in preschool education in Lithuania and Klaipeda region using the method of document analysis; by means of expert interview method to identify the attitudes of preschool teachers and administration

towards the optimization of implementation of achievements assessment of preschool children using the virtual system; to rationalize and allocate the cost of labor in the teaching process; to improve education planning process with regard to children's individual needs and abilities. By means of this data, it is possible to develop recommendations for teachers on how to optimize the assessment of children's progress and the planning of educational process while using virtual systems.

The purpose of the research is to determine the attitudes of preschool teachers and administration towards the optimization of implementation of achievements assessment of preschool children using the virtual system.

The research methods. As previously mentioned, the research was organized on the basis of the results of the previous quantitative research results. The aim was more detailed analysis of the phenomena, using a qualitative research, interview method. Interview data was analyzed using content analysis method. The prevalence of the use of ICT and Virtual Systems was investigated using document analysis method.

Interpretation of the terms used. While analyzing and summarizing the opinions of various authors, Kumari (2014) provides a brief generalized interpretation and defines ICT (information and communication-technology) as any form of technology that is used for sharing information. However, ICT creators and providers extend this concept. Here is one of the definitions: ICT is the infrastructure and components that enable modern computing. Although there is no single, universal definition of ICT, the term is generally accepted to mean all devices, networking components, applications and systems that are combined to allow people and organizations to interact in the digital world (Techtarget, 2018) In the field of education, ICT are understood as a set of digital ways and means of generating, collecting, storing, transforming and disseminating information for educational purposes. The purpose of information, passed by means of these technologies, is to communicate, cooperate, and share information. In the educational context, the use of ICT is expanded and is perceived additionally as learning while communication, reflection, and so on. (Gudoniene, Rutkauskiene, Lauraitis, 2013).

UNESCO documents clearly and rigorously define the concepts: informatics, information technologies and information and communication technologies (ICT). ICT is perceived as a set of methods and means for processing information: to receive, transmit, store, process, distribute, sort out. These functions are exactly performed by a virtual system.

In this article the virtual system (VS) will be called an ICT tool, which is designated to be used by educational institutions, serving the functions of virtual learning environment, e-diary, achievements and progress assessment, etc.

Creators of virtual systems for schools name their products in various ways: *Virtual Learning and Assessment Platform EDUKA, Learning Network „My Diary“, Online system „Our Kindergarten“, Portal for Educational Institutions "Your School"*, etc. It is stated that *Electronic Diaries* or *Electronic System of Achievements Assessment* are just several of the many system functions.

According to the publication of Innovative Teaching Methods and ICT Implementation (2010), we can attribute the following functions to the virtual system in the preschool education process: a learning environment for educators, parents and children; communication and cooperation tool; means for exchanging information; achievements and progress assessment tool as well as a tool for performing administrative tasks.

An Overview of the Use of ICT in the Lithuanian Education Sector

The National Education Strategy 2013-2022 and the Lithuanian Progress Strategy "Lithuania 2030" focuses on public education and training. The strategies note that creativity and leadership must be assessed and fostered from an early age, also, that there is a need to develop and implement educational programs that are open to creativity, exploration and development in all educational institutions, and the system of assessment and self-assessment of one's competence (The National Education Strategy 2013 – 2022, 2013).

In 2015 The Ministry of Education and Science of Lithuania approved the concept of a good school. In this document, the concept of school is complemented by the new highlights - school-as a learning

community, teachers as learners, modern learning methods, organization of education, diversity of environments, learning and life-long learning, different management cultures (paragraph 6). The virtual environment is pointed out as one of the environmental features of education (paragraph 13.8) (Good School Concept, 2015).

While implementing national development strategies and programs, it is increasingly focusing on ICT, by developing these technologies (Internet, Broadband, Wireless, „Cloud Computing"); mobile devices (cell phones, smartphones, tablets); educational games, open educational resources; e-mail portfolio; personal learning environments, social networks (Žadeikaitė, Gulbinas, 2014). Preschool educators are among those professionals who need not only to be able to integrate themselves into a new ICT-based society, but also actively participate in developing ICT-based learning activities, by improving the quality of education. One of the ICT tools is mastering and active use of a virtual system.

Lithuanian schools and preschool educational institutions use the following information systems: electronic diaries: EDUKA diaries, „My Diary", „Our Kindergarten", Siauliai "Sauletekis" Gymnasium's Diary, "Your School" (TaMo), vDiary, Information System "Veritus". The vast majority of Lithuanian general education schools use electronic diaries. Only a small percentage of preschool institutions have implemented respective virtual systems in their activities.

"Our Kindergarten" virtual system for preschool institutions was created in 2010, but only since 2016 it has been applied to a larger extent in Lithuanian kindergartens. In that year the first kindergartens in Klaipeda region began to use it. In other big cities of Lithuania this system started to be used as an experimental much earlier.

The supply with computer equipment is constantly growing. At the beginning of the school year in 2012 - 2013 in the general education schools there were 76 thousand computers, 75% of which were used for training purposes. Most of the computers (92%) had the Internet access. The number of computers in general education schools increased by 30% compared to 2008-2009 school year, as well as the number of computers used for teaching pupils increased: in 2008 – 2009 school year 100 students had 8.5 computers, in 2012-2013 - 15.3, in 2017 - 2018 - 19.4 units. (Education 2017, 2018).

According to the data of the Lithuanian Department of Statistics in 2017 there were 738 preschool institutions in Lithuania, attended by 25,946 children (Lithuanian Department of Statistics, [LT]). There are currently 48 preschool education institutions in Klaipėda, in which 8088 children are educated. Those schools have 844 computers, 456 of which, i.e. 54% are used for pupils' education. On average, one pre-school institution has 17-18 computers (Analysis of Supply and Utilization of ICT in Institutions, 2018).

In 2008, in accordance with the order of the Minister of Education and Science of the Republic of Lithuania „The Description of the Procedure for the Establishment of the Diaries on the Basis of Online Electronic Diary Data was approved. This description is the first document that regulated the use of electronic diary at schools in Lithuanian. In 2016 a new edition of the order was published, in which among other amendments, it is indicated that the following may be made on the basis of the electronic diary data: a preschool group's diary, a pre-primary group's diary, a primary education diary [...] (2nd paragraph). [...] The electronic diary may also be used for further pupils' educational needs in accordance with a decision of a school: for the formation of the evaluation portfolio, etc. (5th paragraph) (Order No. V-195 of the Minister of Education and Science of the Republic of Lithuania, 15 March, 2016).

The assessment of children's achievements and progress is essential in order to improve educational process. The quality of education, the performance of teacher's work, and a prestige of an institution are assessed referring to children's achievements. The ongoing research data (Organization for Economic Co-operation and Development OECD, 2008) reveals that high-quality preschool education helps to solve many social problems - poverty, unemployment, compulsion, improves academic achievements, and makes a positive impact on welfare (Quality of Pre-school Education, 2012).

In 2014, while implementing The EU Structural Funds Project, The Description of the Achievements of Preschool Age Children (hereinafter – The Description) was framed. "The Description" – a

guidance to preschool class teachers and other educators, which provides the whole of acquired moral values and basic skills, also the achievement steps, describing the progress of a child from birth to six years of age.

According to the group leader of promoters of "The Description" Monkevičienė (2015) states that "The Description" is not a standard, this is a guidance document, which aims to help to improve the quality of education. It is based on the attitude that all children are different, and each educates at a different pace. "The Description" is regarded as a document, identifying the direction of children's educational progress. It helps teachers to understand better how the capacities of a child develop, and to organize education (learning) more appropriately, so that child and the teacher's efforts would be directed towards the development of these abilities.

While implementing "The Description ", an assumption that each child's progress depends on his individual strengths and professionalism of educators, is being followed. The purpose of "The Description" – to help preschool class teachers and other educators to identify children's learning achievements and needs, to develop preschool education programme purposefully, to implement the curriculum, by adapting it to each child and a group of children, to observe children's progress and educate each child purposefully.

After examining the recent Education Documents of Lithuania, analyzing the growing tendencies of the supply of ICT for early education institutions, it can be stated that a rapid ICT integration in the whole chain of education, including early education, is taking place; The use of the VS in kindergartens has a huge impact on all participants of early education process: parents, children and especially educators; The use of VS is undoubtedly changing the quality of education process; the forms of planning, organization, cooperation and achievements‘ assessment of the educational process are changing. A virtual system "Our Kindergarten" has been created especially for preschool educational institutions. However, creators of certain systems for schools point out that those systems can be applied to kindergartens. During the research any preschool institutions that use a different virtual system were detected.

The Attitudes of Preschool Teachers and Administration towards the Optimization of Implementation of Achievements Assessment of Preschool Children Using the Virtual System.

The stages, course, and changes discussed in the introduction to this text.

Respondents. 7 Klaipeda region pedagogues, using the virtual system in their professional activities, having at least 5 years of pedagogical work experience, and having a professional qualification of nursery teacher, senior nursery teacher, methodologist or expert were chosen as interview experts. It is likely that the selection of such a criterion for selected informants will provide detailed information about the phenomenon and the chosen research method will allow the goal of the study to be attained in the most optimal way.

Ethical principles were followed by during the research: confidentiality - the personal data of the respondents are not publicized, they are encoded in the reports and known only to the researchers; justice - research data are analyzed in accordance with the methodology of qualitative analysis, are presented without misinterpretation, interpretations are made referring to the direct informants‘ text; volunteering - participants take part in the research by free will, are not affected by the researchers or the administration of the nursery, the interviews are conducted in a place and time, convenient to a respondent.

Interview questionnaire consists of three information blocks. The first block is dedicated to the personal data of a respondent: gender, age, work experience, qualifications, experience while working with the virtual system, what age of children she works with. The second block focuses on actual and problematic issues: what kind of technical equipment is used (and what kind is available in kindergarten), in what kind of professional work spheres (educational activities) they use VS, how the assessment process of children's achievements has changed since the VS was introduced (what difficulties and positive aspects they have encountered with). The third block is devoted to perspective questions: what would the informant advise for teachers, administration and parents when starting to use VS in kindergarten in the educational process, while assessing children's achievements.

The research results

The characteristics of the informants. The educators are all women (in Lithuania 99.9% of women work as preschool education teachers, therefore, the sample of informants with regard to gender matches general statistics) from 26 to 63 years of age, qualifications: 4 nursery teachers, preschool educators, 1 nursery teacher, a teacher of pre-school education, 2 - methodologists, deputy directors of a kindergarten. 1 nursery teacher works with an early age group (2 to 3 years of age), 1 - with pre-primary age group (5-6 years old), 3 – with a preschool age group (4-5 years old), 2 are in charge of kindergarten‘s educational activities. Work experience: from 2 to 44 years. The kindergartens use the VS from 1 to 2 years. 4 educators have been using the VS for 2 years, 2 – for 1 year, and 1 educator – for 1.5 years. All the educators in the kindergartens have been using the VS systems since they were installed in their kindergartens, i.e. in the kindergartens where they work the VS was installed in 2016, 2017 and 2018. As already mentioned in the previous chapter, in Klaipėda region, the VS was begun to be established in preschool education institutions from 2016, when the legal basis for this was created: the Order of the Minister of Education and Science of the Republic of Lithuania (2016).

The supply of technical equipment. All the kindergartens, in which the respondents work, are equipped with computers, the VS is installed, all work with "Our Kindergarten" VS, in 3 of 7 kindergartens each educational group has a stationary computer or laptop, 6 of 7 use wired Internet connection (linear), 1 - Wi-Fi. The most commonly used devices to capture educational activities and achievements of children are their own mobile devices - smart phones (because the kindergartens do not have enough video or audio recorders), while for transmission-receiving the information as well as for access of information data the VS is used.

The use of VS during the educational process. All respondents indicate that they use VS while creating curriculums, exchanging information with colleagues, working with children‘s parents, recording, collecting and documenting children's achievements.

An informant No.3 indicates how she carries out the process of education planning and implementation, using VS:

"When using the weekly curriculum, I use the" Preschool children‘s achievement profile ". Taking into account the early age of children, I plan educational activities gradually, starting with the adaptation period. In the course of the week during the education process, or by monitoring children in their daily activities, ideas for an activity are born or children themselves "dictate" ,which I mark in the table for a following week period. I distinguish children's achievement areas, education aims, goals, and the final desired result. The planning for VS takes place on the "Pathway" principle. "

Working with parents. All the questioned educators indicate that the use of VS promotes parents' involvement into education process. By the means of VS parents have an opportunity to join the VS at any time, which is convenient to them and see educational plans, daily menus, as well as achievements, visual or written information about their child, uploaded by a teacher, to receive a message or write a message to the child's nursery teacher or kindergarten‘s administration.

An informant No. 6 points out her experience regarding communication with parents using VS:

"It is very comfortable both in informing and communicating with parents. It is an opportunity to send general information as well as personal messages to all parents of the group. Parents see weekly group plans, only their child's achievements and assessment during the school year, recorded joint activities (photos of the activities). The usage of personal mobile phone to send messages or make calls to anyone personally is avoided. It also saves time. Most importantly, in my opinion, in this way parents are involved both into children‘s education and into the community life. By actively participating in group activities, most parents willingly cooperate with group’s educator. This is my personal experience. "

2 of 7 educators point out that they not only write information for parents to VS, but also print it on paper and hand out a paper version. Informants No. 1 and No. 5 indicate:

"While fixing and accumulating children's achievements, we firstly fix it on a computer, then reprint it on a page and finally introduce to parents. “ „Connection has speeded up, but I still use verbal

information, because not all parents use this system. I am more confident to communicate face to face. "

All educators are happy with parents 'engagement, 2 indicate that some parents rarely join or not join the VS at all (but point out that only a small part), 1 teacher (informant No.3) is pleased that parents are positive about a teacher who uses VS in an older age:

"Another point, which I want to mention, is a positive attitude of young parents towards the ability of teachers, especially older ones, to use ICT, who is capable to change referring to the epoch, to the needs of a new generation."

Fixing, collecting and documenting children's achievements. All teachers point out that after VS had been introduced, it became easier, more convenient and time-consuming to evaluate children's achievements.

Assessment has become a continuous and an integral part of educational process. Information, regarding child's individual qualities, his educational needs, the general situation of the group of children, the effectiveness of educational activities is provided to a teacher. On the basis of this information an educator plans educational activities and sets the goals.

An informant No. 1 states: "*.... When recording, fixing child's achievements, child's weak and strong sides, his progress during the school year are visible. It helps while assessing children's achievements, creating weekly educational activity plans and individualizing education in accordance with the needs, abilities and other peculiarities of a child ".*

The teachers point out that recording is convenient, since the VS achievements' assessment table is drawn up referring to *The Description of Achievements of the Preschool Age Children* (2014), which indicates specific areas of achievements. By recording child's achievements, it is easy to find a specific area of education and mark it in the system, to attach proof documents (photos of handicrafts, activities' audio, videos, language samples, etc.). The VS enables you to receive the achievements' summary of a particular child or a group. Thus, in any educational period it is possible to obtain data of children's achievements and progress, to clearly see the results of education, the performance of teacher's work, and the changes in the quality of education.

When asking about the difficulties encountered while using the VS, the informants point out the following:

• Not all parents use VS or join rarely (points 3 out of 7)

• It is difficult to upload photos to VS (4 out of 7).

It has been found out that uploading group photos has become complicated, because in accordance with the Private Data Protection Act, children's photos can only be seen by their parents or parents of other children of a group if consent is obtained. In this way, while uploading photos, each child in the picture is tagged and visible to others only with the consent of his or her parents. It is believed that this also complicates the process of uploading visual material containing children.

An Informant No. 1 points out: *"One minus is a long process of uploading photos to VS. It is easier to upload photos on Facebook's closed parent group. "*

Some teachers work in parallel with the VS, use Facebook (3 of 7), 1 respondent creates such closed groups for communicating with parents and communication among parents by herself, 2 respondents indicate that they do not create such groups by themselves, but if parents so, they participate in such a closed group. An informant No. 4 points the following motive: "*I have to know what parents really think and what they are talking about with each other. A closer relationship with parents, common discussions are sometimes very emotional among parents. „2* of 7 mention that they never create Facebook groups and do not participate in existing ones. An Informant no. 7 explains the reason: *"... I want parents to get used to log in to the system at least once a day and see what we are doing."*

During the interview, we asked the respondents what the advantages of using the VS are and what they would advise to educators, administration and parents before starting to use the VS in kindergarten's

educational process, assessment of children's achievements. After the answers had been analyzed, we highlighted the following tips:

- Teachers are advised to use VS, as this is essential for the quality of work.

An informant No. 3 states: *"I would advise everyone to use the VS as a key tool for improving the quality of education. Nobody should be afraid to use innovative tools (I attribute the VS to innovative tools), because today it is inevitable. „The* informant No. 5 states*: "First of all, there is no need to resist to VS, but accept it as a natural change."*

• It helps to save time, communicate, cooperate.

An informant No. 1 states: *"A great tool to save time of a teacher, helping him to communicate with the parents of young learners and colleagues".*

• It helps to plan ahead educational process.

An informant No. 2 states*: "You will notice that it will be much easier to plan an educational process, make plans, and manage the attendance of children."*

• It helps to discipline the participants of education process.

An informant No. 7 states: *"It is very helpful in introducing the order, since we mark the children who arrive until 9:00 am, parents have to bring their child by that time, and then we mark VS data which cannot be changed, as a nutritionist informs the kitchen about the number of children."*

• Convenient dissemination of information.

Informants No.1 and No.6 indicate: "The information, regarding institution's issues, is easily accessible and reachable to every teacher". "It is very convenient when exchanging information among colleagues. An important information from administration reaches everyone promptly. Misunderstandings when passing it orally are avoided. "

• Easy to document.

The Informants No.2 and No. 7 point out: *„Not to be afraid to use the VS system, it is possible to make mistakes, correct them, and make the work easier for you." "It is convenient to mark your child's attendance"*

• Parents are encouraged to use VS and thus better understand and influence the educational process associated with their child in a kindergarten.

An informant No.3 says: *"I would also advise parents to use VS to see and assess the importance and quality of education. In order to understand that by cooperating with an educational institution parents have an opportunity to contribute to the search and implementation of new ideas and forms of education, as well as to improve the community's microclimate. Whereas all this affect the quality of their children's education. "*

Instead of conclusions

To sum up, it can be stated that all respondents see VS as a convenient, modern work tool, the use of which in the near future will inevitably become a daily commonness for every educator. The VS helps to optimize work and time costs, completely eliminating the misinterpretation or delay of information among administration and educators. Documentation of activities has become convenient and economical (no need to write by hand, paper version variants are got rid of). The assessment of achievements and progress has become a daily, simple process that parents can monitor themselves. The data regarding achievements and progress assessment of a child is accumulated throughout the period of his nursery education, therefore with the help of VS long-term information on his development can be provided. The fact that parents have an opportunity to receive on-the-spot information about the activities which take place in kindergarten and their child during them, his progress and achievements accomplished by him, encourages more active involvement in kindergarten‘s community life as well as educational processes. The activities and projects, organized by teachers, the dissemination of good experience and professional competences have become more

visible and valued. Teachers' motivation to develop is gaining more additional elements. We can unambiguously state that the implementation of VS into preschool education institutions is a fully positive phenomenon that promotes the development of assessment of children's achievements and progress as well as the whole education process.

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