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Interactive-Multimedia Playful Game Sheets and Panels of Preschool Institutes

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Interactive-Multimedia Playful Game Sheets and Panels for Preschool Institutes

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Abstract

ICT in educational process crashes classic theory of psychological development of the child. According to them, the process of adopting of new concepts (thought process) in pre-school institutes ranges from perception of the senses (sight, hearing, touch), speech and direct manipulation of real objects (teaching resources), towards the creation of abstract concepts. In other words, that child would "see the object in their head", had to "see it and touch it with the hand!" first. With the introduction of modern educational technology, the whole process of learning and assessment of knowledge moved to the virtual environment. Perceptual abilities, compensated realistic tactile impressions and direct manipulation but not at the expense of the quality of learning. Examples from practice confirm that. The paper aims at presenting samples of interactive-multimedia game sheets and panels for future base of E-didactic materials from the Methodology of developing initial mathematical concepts for preschool needs.

Keywords: traditional learning, ICT, educational technology, interactive-multimedia game sheets and panels, databases

Introduction

According to the classic (Pijaže, Inhelder, 1978: Bruner, Vigotski, Galjperin, Montesori) theory of psychological development, the thought process of a child ranges from direct perception of the senses, speech and manipulation of real objects from the direct environment and natural environment, to the creation of abstract concepts and opinions. This process-sequence, is conditioned by the development of psycho-physical characteristics and nature of the cognitive process of preschool children (Piaget, Inhelder, 1978).

Similarly to this, the process of adoption of new concepts in the preschool educational process methodology of mathematics, says Kamenov, as the "3P" (P_1 – "demonstration"; P_2 – "presentation" and P_3 – "showing"), Graph 1 (Kamenov, 1999). The same author has large number of publications from the field of children's mathematics – playful sheets (Kamenov, 2005).
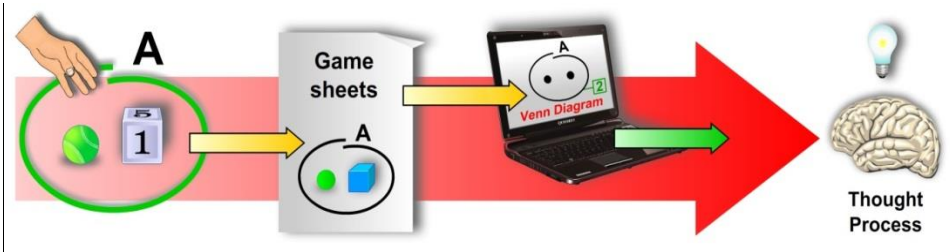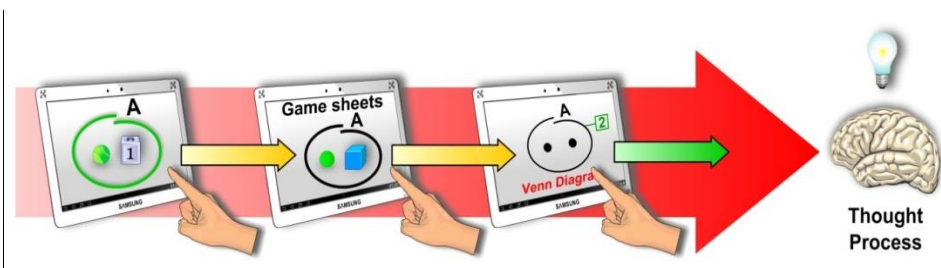
Graph 1

According to Kuleto, senses generations that grow up in the digital age with the informational-communicational technology (ICT), are adapted to stimuli (content) emitted by modern media. This is not about genetics, but the reaction of the body and brain to such an environment. The goal of modern education is to offer an environment appropriate skills of new generations, that means, teaching content, resources, models and learning methods **in the form of rich graphical applications**. Due expressed perceptual abilities of today's young people, they very easily accept these visual forms and learn more effectively using them. Lecturers must follow up this changes and offer contents which are rather watched and observed than hand over and listened. Therefore, it is necessary to:

– attention of children direct to visual learning methods,

– they must focus on the critical thinking and problem solving, and not on storage of unnecessary information (Hilčenko, 2008, p. 64), and

– it is important to adapt lectures for the needs of young people in the criteria of time (Hilčenko, 2015, p. 68–69).

The introduction of ICT in the classroom, that is, the modern educational technology, the whole process of learning and knowledge testing moved to the virtual environment. Perceptual abilities compensated real tactile impressions and immediate manipulation but not to the detriment of the quality of learning (Graph 2). This can be illustrated by examples from practice.

Graph 2

Examples that confirm practice

ICT, the learning process can be simplified-accelerate but not at the expense of the quality of learning. Sensory-tactile contact with educational resource and didactic material IT'S NOT LONGER APRIORI NECESSARY! *That child would "saw the object in their head"*, it *DOESN'T have to see it or touch it with hand first!*

There are numerous testimonies of teachers, who have enriched their teaching practice with learning by using smart electronic interactive whiteboards (IAWB). They emphasize the unparalleled motivation, attention and joy of child for work and the dynamics of this teaching. Therefore:

The mathematical operation of subtraction in the traditional approach, for children often means a bogey, "Magic ingredient of work with IAWB, is reflected in the act of removing virtual apples from the set and their fading in the virtual bucket, which is far more effective than exercises using real apples. By introducing 'garbage buckets' in which is placed the 'excess' (difference) in children usually causes optimistic ''Ah!' IAWB may be part of everything we do during the day. From the benefits of morning messages, calendar or daily poetry readings, through the graphical representation of the colours, for learning numbers and letters… IAWB makes each event more lifelike. I use it to handle new themes, exercise and evaluation of knowledge of each child, both in large and in small groups" (Hilčenko, 2014, p. 101).

The company "Blivik Polytechnic" ("Blivic Politehnics", Poland), develop virtual application intended for children with motoric problems, autism and Down syndrome. Therapists involved in the project, points out a greater willingness of patients to cooperate compared to the conventional methods of treatment-direct motoric activities (and specially designed didactic materials). According to prof. Laris, children lose interest in working with traditional methods of treatment, while the application of this method in so called "3D cave", the situation is reversed. Subsequent measurements of joint mobility with this approach, it has increased. Children are in this process more open for cooperation and communication and more motivated to work[1] (Hilčenko, 2015b, p. 113).

The authors of the study entitled, *Flashing into a child's mind: the educational impact of children's multimedia on learner satisfaction*, emphasize accuracy of hypotheses research, that the children in the experimental group reported more satisfaction scores after interaction with computer games than it was after the **traditional worksheet** that contained the same mathematical problems. In addition to an increase of 23.5% in just declared pleasures when using computers, the study also found that, once they have a choice, 77.3% of children prefer to learn with the help of computers. The study shows that computer technology

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[1] http://rs.n1info.com/.

can be that necessary link that will return the enjoyment of learning, and thus accomplish a higher level of achievement (Paschke, Paschke, 2005, p. 20–23).

Experimental studies show that ICT technologies associated with drones – a system of cameras scattered in the room, projects images on the four sides of the flying drones, creating a virtual reality "of actual physical objects" for example. form of a cube. This display of "virtual materialization", enables the actual manipulation of these objects on the hands of observer as well in the real world without any additional equipment such as VR glasses http://rs.n1info.com/.

Same but different, examples of interactive-multimedia game sheets and panels

Presented traditional game sheets and panel (Picture 1), are designed to meet the needs of textbook **Methodology of development initial mathematical concepts** and can be found on the accompanying DVD, can be printed and used in the activities. Total material from the 60 game sheets and 12 panels, the author will also prepare it as an interactive-multimedia didactic material for tablets and IAWB. Because of the workload, but also with the desire to increase that number, they will be found in the second edition of the textbook, as a special E-edition or address http://www.vsovsu.rs/, from where preschool institutes can download them (Hilčenko, 2017, p. 180, 210–211, 215, 220, 224, 227–228, 229, 242, 244, 258, 263, 275, 276, 283, 297, 319–320, 341, 365, 401, 405, 422, 423, 424, 425, 429, 432, 433, 434, 435–436, 439, 440, 444, 448–450, 454, 561, 474–475); Picture 2: example of identical traditional and interactive-multimedia game sheets; Picture 3: example of traditional and interactive-multimedia game panel.
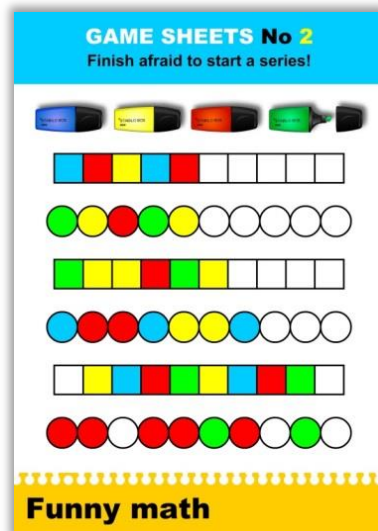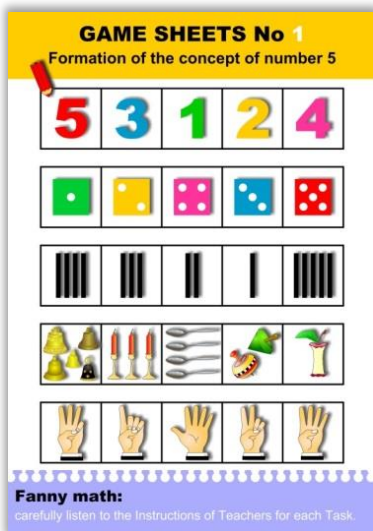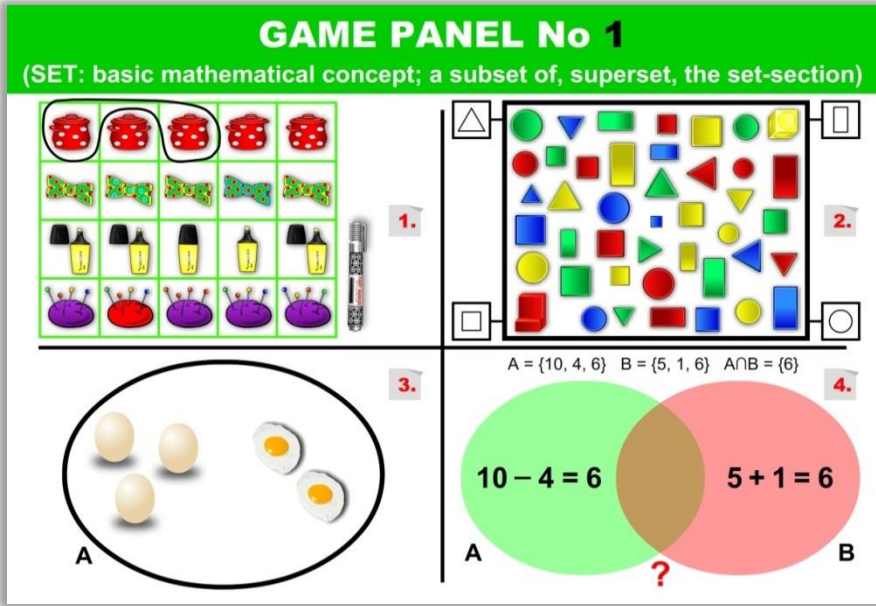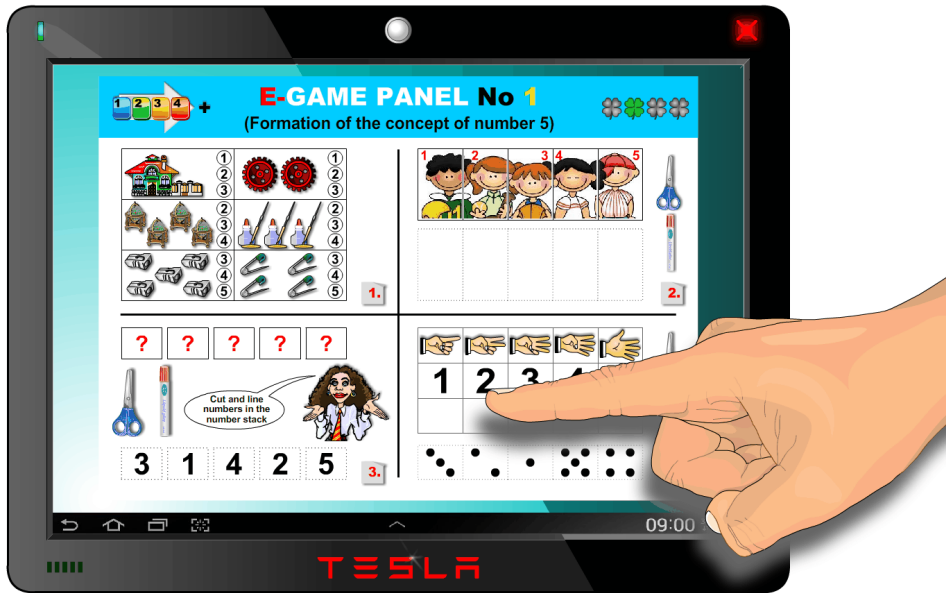
Picture 1. Examples of the traditional game sheets No 1, theme: Serration, **game sheets No 2, theme:** Formation of the concept of number 5 **and panel, theme:** Collection: basic mathematical concept; a subset of, superset, the set-section

Picture 2. Example of identical traditional and interactive-multimedia game sheets on the tablet. Theme: Classification

Picture 3. Example of interactive-multimedia game panel,adapted for work on IAWB.
Theme: Processing of the number 5

Conclusion

How the abstract mathematical concepts can not be "seen or felt", they are being interpret with the real objects. The roots of these concepts are in the real world and the educator had to find an optimal "link" between abstract concepts and real world – which was the best way for children to understand them. Psychophysical development of the child is not conditioned by ICT, but phylogenies that shaped the man through a long period of time, much longer than the appearance of technology and it has its own laws and development stages. Therefore, creation of new concepts leads through complex manipulation-thinking activities.

But the impact that ICT's will have for a longer period of time on the man is not yet known. It is known to improve perceptual skills of young people and they desire to meet this need. Education here is not and should not be an exception. The famous maxim of Galileo di Vincenzo Bonaiuti de 'Galilei (1564–1642), "*Nature speaks to us with mathematical languag*" in the ICT environment is increasingly losing its significance. Namely, the ICT abstract mathematical concepts interpret with abstract means (interactive visual 2 and 3D applications, virtual reality, holograms) ... Famous pedagogical principle of intuition as to lose its importance, is no longer relevant. She senses of the young people (vision, hearing, touch) are now adapted to the means of ICT, and manipulation of real objects is becoming less important in the understanding of mathematical concepts.

Still, we are with attitude, that it is best to combine traditional approach with ICT resources. Uniform promotion and development of psycho-physical (manipulative-motoric) skills or cognitive-conative potentials of children, will not be supported evenly, with one-sided approach to teaching (forms, methods, resources and didactic materials), but with their intertwining permeation.

What we are facing in continuation of the research is the comparison of the results of resolving game sheets and panels (traditional and interactive--multimedia) from mathematics and the level of motivation of children in both modes of work.

Literature

Hilčenko, S. (2008). Educational Software as Encouragement in Learning How to Do Solving Mathematical-logical Tasks of the Primary School Students. *Inovacije u nastavi – časopis za savremenu nastavu*, *21* (3), 62–68.

Hilčenko, S. (2014). *Obrazovna tehnologija, udžbenik za studente, vaspitače i roditelje dece predškolskih ustanova*. Subotica: Visoka škola strukovnih studija za obrazovanje vaspitača i trenera.

Hilčenko, S. (2015a). An E-model of a Flipped & Heuristic and Functionally & Logical Learning for the Generation "Z" in the Classwork. *International Journal of Elementary Education*, *4* (3), 68–69.

Hilčenko, S. (2015b). Biti ili ne biti: tehnologija ili čovek!? In: *8. međunarodna interdisciplinarna naučno-stručna konferencija "Horizonti" 2015. Zbornik radova* (p. 112–116). Subotica: Visoka škola strukovnih studija za obrazovanje vaspitača i trenera.

Hilčenko, S. (2017). *Metodika razvoja početnih matematičkih pojmova, udžbenik za studente vaspitačkih škola*. Subotica: Visoka škola strukovnih studija za obrazovanje vaspitača i trenera.

http://rs.n1info.com/ (2.2017).

Kamenov, E. (1999). *Predškolska pedagogija*. Beograd: Zavod za udžbenike i nastavna sredstva.

Kamenov, E. (2005). *Dečja matematika (igrovni listovi)*. Novi Sad: Tampograf.

Paschke, C., Paschke, J. (2005). *Flashing into a Child's Mind: The Educational Impact of Children's Multimedia on Learner Satisfaction*. An Engineering Honors Project Report Submitted to the Mercer, University School of Engineering, MACON, GA.

Pijaže, Ž., Inhelder, B. (1978). Intelektualni razvoj deteta. Beograd: Zavod za udžbenike i nastavna sredstva.