The Influence of Computer Games on Children's Play Activity Development

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Abstract: Young children's play allows to explore the world, negotiate with peers and create meaningful ideas. The purpose of the paper is to explore a play theory and to describe criteria for effective choosing the appropriate computer games for children's development. The paper gives a classification of the computer games for kids using in Russian kindergartens; it also contains the description of ways in which computer games could influence children's development and the scaffolding features on using computer games for children's play activity development.

Key words: Early childhood education · Play-based learning · Kindergarten · Computer games · Theories of play · Scaffolding · Mature play

INTRODUCTION

Intellectual and social benefits of play as children's activity have been documented widely [1], [2]. Children engaged in play experiences are more likely to have well-developed memory skills, language development and are able to regulate their behavior, leading to enhanced school adjustment and academic learning [3]. Researchers mark that nowadays young children spend less time playing with their peers and more time playing alone with computers or mobile phones, in the classroom children tend to rely on realistic toys and props and have a hard time using their imaginations to invent a substitute for a prop they do not have [3]. According to play observation in several kindergarten classrooms in Russia, China and France made in 2010-2012 academic years children had frequent problems to try a new topic or plot, preferring to act out the familiar scenarios of family or hospital. Preschool education researchers state that play that exists in many of today's kindergarten classrooms does not fit the definition of mature or well-developed play [3], [4], [5]. Following Bodrova and Leong (2008) even 5- and 6-year-old children who according to famous Russian psychologists Vygotsky and Elkonin should be at the top of their play performance often show immature play signs more typical for toddlers [6].

Analysis of the software for children shows the huge opportunities that computer games have for intellectual, emotional and social development, as well as for children's learning [7], [8], [9]. According to the theory of play and children's development computer games and gaming platforms first of all should make an emphasis on make-believe play, secondly take into account the stages of play. That makes very actual the problem of scaffolding the process of computer games introduction into kindergarten classroom activities. However, in the literature, there is a lack of examination of the value of computer usage in children's play development.

Methodic: In 2011 International Center for the Childhood and education of Volgograd State Social and Pedagogical University started the project "Childhood without borders". One of the objectives of the project was to support innovative practices in preschool education. The project had a number of subprojects which were oriented to different areas of children's development. One of subproject realized cooperatively with Volgograd State Technical University was dedicated to using Information and Communication technologies in kindergarten. Main participants were teachers from municipal kindergartens. Totally 30 kindergartens were involved in the project.

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The essence of this subproject was in complex analysis of using computer games in kindergarten for improvement of children's development.

Research questions for 2011-2013 academic years: What are the most important factors for selection computer games by teachers during children's classroom activities; If the factors concern the theory of children's play development. We planned to identify the common problems or difficulties that children and teachers face using computer games in kindergarten classroom. For answering the research questions we used combined type questionnaires where teachers could choose the variant of answer or could write their own answer. From 2011 it was organized special kindergarten teachers' community for analysis the scaffolding methodology of children's play development with support of computer game programs.

Scaffolding the Development of Play with Computer Games Support

Play-Based Learning in Preschool Age: Play-based learning is a context for learning through which children organize and make sense of their social world, relate actively with people, objects and representations. There is a long standing tradition in play research that focuses on play itself in its multiple forms, recognizing it as a distinct child-initiated activity with its own unique contributions to child development. Jean Piaget (1951) and Lev Vygotsky (1956) were among the first who link play with children's development [10], [11]. Roskok and Christie (2001) underline that play is not a singular construct but rather a continuum of playful behaviors that children engage in the context of Early Childhood classrooms, encompassing a set of behaviors that vary in terms of the degree of adult guidance and support [12]. During the growing process new levels of play appear when children move from infancy to preschool age. There are several classification schemes for the play of young children. Piaget (1951) described three stages of play, in which children's ability to think symbolically corresponds to the structure of the play. The first level is associated with the sensorimotor stage and is called functional or practice play and consists of repetitive motor movements with or without objects. Second level concerns symbolic, or pretend, make-believe play. The last stage of Piaget's classification contains games with rules, which is based on children's understanding and following rules in play

activities [10]. Parten (1933) described four categories of children's play: nonsocial play, parallel play, associative play and cooperative play. Those two last levels of play represent higher levels of interaction when children actually play together, doing similar things and coordinating their actions [13].

The investigation of the relationship between the quality of play and children's educational outcomes discovers that mature (well developed) play is the most powerful tool for children's learning and development. Bodrova and Leong (2003) define several quality characteristics of mature play such as:

- Imaginary situations when children assign new meanings to the objects and people in a pretend situation. When children pretend, they focus on an object's abstract properties rather than its concrete attributes. They invent new uses for familiar toys and props when the play scenario calls for it. In doing so, they become aware of different symbolic systems that will serve them later when they start mastering letters and numbers.

- Multiple roles which are not stereotypical or limited; the play easily includes supporting characters. For example, playing "hospital" does not mean that the only roles are those of doctors. Children can also pretend to be an ambulance driver or a phone dispatcher. When children assume different roles in play scenarios, they learn about real social interactions that they might not have experienced (not just following commands but also issuing them; not only asking for help but also being the one that helps). In addition, they learn about their own actions and emotions by using them "on demand." Understanding emotions and developing emotional self-control are crucial for children's social and emotional development.

- Clearly defined rules. As children follow the rules in play, they learn to delay immediate fulfillment of their desires. Thus, mature play helps young children develop self-regulation. To stay in the play, the child must follow the rules.

- Flexible themes which are flexible enough to incorporate new roles and ideas previously associated with other themes. When children play at a more mature level, they negotiate their plans. By combining different themes, children learn to plan and solve problems.

- Extensive use of language by children to plan their play scenario, to negotiate and act out their roles, to explain their "pretend" behaviors to other participants and to regulate compliance with the rules. As the repertoire of roles grows, so do children's vocabulary, mastery of grammar and practical uses of language and metalinguistic awareness.
- Not limited length of play which can last for many days as children pick up the theme where they left off and continue playing. Creating, reviewing and revising the plans are essential parts of the play. Staying with the same play theme for a long time allows children to elaborate on the imaginary situation, integrate new roles and discover new uses for play props [3].

Contemporary system of children's teaching and learning cannot avoid the computer technologies as the powerful tools for development. Educational game-based computer programs for preschool children are oriented for 3 to 8 years old users and according to developers are made with the ideas that play is the main activity for that age category. Classification of educational computer games is needed both for teachers and games developers. Teachers can find easily the necessary program if headings give answers for such questions as "The games for 3-4 years old children", "The games for speech development", "Programs with animals images" etc. Moreover, for developers such classification is helpful for their professional analysis of educational games market. Analysis of educational computer programs existed in Russian computer market highlights following big groups of children's computer programs: developmental games which can be described as "open" type ones, where the goal is not defined clearly and games become tools of children's creativity and self-expression; learning games which are strongly didactic-oriented and can be described as "closed" ones and where children are supposed to solve any learning task in a form of play; games – experimentations where goals and rules are hidden in the game's plot or in in the management tools and a child need to discover the goal and the mode of action by searching and solving problematic situations; computer games for diagnostic which can be identified as psycho diagnostic and validated methods, they fix and memorize given parameters, then process and memorize the results; computer games for therapy and correction some physical or mental diseases.

Discussion on Scaffolding Kindergarten Children's Play Development with Support of Computer Games: Preliminary study made before implementation of this project into pedagogical reality allowed us to make a list of principal ways in which computer games could influence children's development. Basement of these principals were postulated by Vygotskiy's students [14], [15]. Following Elkonin (1978) these ways could be identified as outcomes of children's development through game-based activity [14].

- Computer games can affect child's motivation. Effective play scaffolding gives good opportunity to develop motives from the forms of affective immediate desires to a hierarchical system of children's goals. Evidently it is more productive if the software gives possibility to children fix their planning results in graphic form (written or painted).
- Computer games can facilitate cognitive decentering. As a play role is the basement of such a decentering it is demonstrated in appearing of a role name and a role speech. This ability to take the role provides the possibility of new relationship form such as "I am" – "I am in role" where children can understand the difference between their actual position and the position of the objects, whose role they are playing.
- Computer games can advance the development of mental representations. Such a development takes place as the result of a child separating the meaning of objects from their physical form. In ordinary games it happens from using replicas to substitute for real objects, through using new objects which can perform the same function as the prototype, to such a substitution which takes place in the child's speech with no objects present.
- Computer games can foster the development of children's deliberate behavior. It happens because of the necessity to follow the rules of a game. Later, this deliberateness extends to mental processes such as memory and attention.

Aiming the collective analysis of existing situation with game-based kindergarten learning we organized kindergarten teachers' community on the base of International Center for the Childhood and education. The community included more than 200 teachers. They were divided into several work groups for working on creation the data for scaffolding of children's play development by using computer games.

Table 1: Criteria of choosing computer games for children

Characteristics of play	Criteria for teachers
Play is a spontaneous, self-initiated and self-regulated activity.	This computer game allows children to freely engage in play.
	It provides a freedom of choice.
Play includes a dimension of pretend.	This computer game allows children to create their own scenarios, rules and characters of the play.
	This computer game enables children acting in an imaginary situation?
Play consolidates learning that has already taken place while allowing for the possibility of new learning in a relaxed atmosphere.	This computer game has the potential to develop new concepts and skills. What are the concepts and skills?
	This computer game allows for and nurtures the active participation of the child.
	This computer game engages the child in problem-solving and self-discovery.
In play children achieve a mental representation of social roles and the rules of society.	This computer game involves and develops use of symbolic meaning.
	This computer game provides children with an opportunity to act out and explore the roles and rules of functioning in adult society.
	This computer game allows for group work and collaboration?

Each group analyzed 5 developmental computer games for 5-7 years old children according to the criteria (Table 1).

The teachers presented the results of collective research on monthly seminars and shared ideas in web activity on the internet page of the International Center for the Childhood and education. For comparing play activity in real and virtual reality we used terms computer game and "real" game to underline the realistic or nonrealistic nature of actions.

RESULTS

The results of researching activity are presented below.

- There is a difference between "real" games and computer games in visual separating the meaning of objects from their physical forms. In computer games actions take place in imaginary reality but with real feelings of players. The oral speech loses the main role in creation and supporting of imaginary situation because every situation detail is seen on the screen. The potential of child's cognitive development could be reduced also due to absence of symbolic substitutions necessity in most computer game programs. It occurs because technologies allow children to create any objects in virtual space of a game. These factors cause risks that play actions realized in computer games do not become generalized and minimized as they do in "real" games. To avoid these risks kindergarten teacher can organize special scaffolding of mental representations development by including speech

actions (oral and written) on different computer game situations in classroom activities; also it can be helpful if teacher combines computer and real playing on one topic to create symbolic objects as substitutions of the real ones.

- Analysis of computer software for children highlighted another difference of imaginary situations in "real" and computer games. The giant difference lies in nature of the situation. In computer games that we studied the situation was created by the game developers not by children. Children can play within the frameworks of created situation but cannot principally change it. If they play social situation with computer as a partner they should follow computer guided program of relationships. It can significantly narrow down the developmental potential of playing activity. Scaffolding program can include group playing of one situation when children share their ideas on the scenario development, plan actions in cooperative way and the most important continue the computer game scenario in "real" play where they are absolutely free in their imagination.

- The stage of preliminary orientation in computer games acts not on the semantic level but on the level of actions. Awareness of the action mode before its starting is the feature of child-computer relationship. That is why knowing of the rule and actions modes should exist in child's mind before computer playing and scaffolding program should include preliminary discussion of future play rules, kinds of actions and modes of manipulating.

- The main problem of using computer games for education goals lies in the plane of taking the role. In most computer games the plot is defined externally.

Therefore the roles are imposed with graphic images, actions modes even names. Sometimes the role prototype is not defined and should be created in playing process. In case of such "independent" existence of a role there are two variants of interrelation:

- Identification with a role, transferring the part of "I am" on the computer game hero and further playing in the form of the hero management.
- Partnership with a game hero, cooperative playing with the new friend.

- Computer technologies give opportunity for trying both types of interrelations with the game hero. For the first type the games should show the game situation directly "from the player's eyes". For the cooperative playing with game personage there are games where situations provide the view to the personage "from the outside". It is evident that the second type of games should be chosen by teachers for education and development goals because appearing in the game of other person will enable children to develop coordination of their cognitive perspectives with their learning partners and teachers.

CONCLUSION

This paper discussed the problem of preschool children's play development by using opportunities of computer games. Study of the play-based learning features in preschool age showed that play-based learning is a context for learning through which children organize and make sense of their social world, relate actively with people, objects and representations. The main idea of the paper is in understanding of a play as not a singular construct but rather a continuum of playful behaviors that children engage in the context of Early Childhood classrooms, encompassing a set of behaviors that vary in terms of the degree of adult guidance and support. Special scaffolding actions made by teachers are necessary due to crucial importance of children's development outcomes obtained through game-based activity. Such outcomes include establishing of motives hierarchy, cognitive decentering, mental representations and others.

The research included two stages. On the first stage aimed to clarify the factors influencing teachers' choices of computer games the questionnaire allowed to define that all the teachers' factors are not oriented directly to

development of children's play activity. This fact made the orientation for further research work united more than two hundred kindergarten teachers from Volgograd city. The paper summarized the problems and recommendations to scaffolding process for teachers who are interested in using computer games for effective children's development.

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