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Original paper

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# The Role of Digital Games in Children'S Life

**Summary:** Starting from the questions to what extent children use digital games and for what purposes as well as whether teachers play a role in the creation and presentation of different teaching content by using digital games, a survey was conducted with pupils of the third and fourth grades of primary school in the Republic of Serbia. The research involved three hundred and eight students from two private and four state primary schools. The results show that 100% of the respondents confirm that they play digital games, mostly for the purpose of entertainment and recreation, but also for understanding and observing a new educational content. The results of the survey also showed that there is a significant difference in the level of using digital games in public and private schools. Examining students' attitudes towards the use of digital games in teaching indicates that children are highly motivated to master educational content through digital games.

**Keywords**: children, education, learning, digital games, play.

# Introduction

The game as a key component of children's development and their learning has gained a prominent place in modern forms of education, learning, and teaching. In this modern digital age, digital types of games have been developed which are now increasingly responding to the world of children and young people. Games contribute to spontaneous learning, interactivity, and dynamics through learning, as well as to the functional adoption of new learning contents. According to Žarko Trebješanin, game is "a multifaceted term that includes different

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and opposite concepts" (Trebješanin, 2008: 183). On one hand, the game can be viewed as a free, spontaneous activity which does not have a practical goal and it is performed for satisfaction. The performance of a game is accompanied by feelings of joy and satisfaction. Apart from spontaneous games, there are games that are organized, pre-planned, target-oriented activities with clear rules and involving a specific start, progress and completion, such as various social, competitive and sports games. Games can be divided into children's and adult games, competitive and cooperative, traditional and modern, and other types of games (Trebješanin, 2008). The era of information and communication technology has brought a digital type of game that is becoming an everyday activity of children. A digital game is a game type that is played with different digital devices (computer, tablet, mobile phone, etc.). Children nowadays use digital games in their everyday lives both for entertainment and learning. "Like video, film and even books have done in the past, digital games are becoming a part of the educational process" (Michael & Chan, 2006:142). Stapleton in his article Serious games: Serious opportunities emphasizes that "Games provide powerful and meaningful contexts for learning" (Stapleton, 2004:1). While digital games are becoming more and more a part of children's lives, it is extremely important to find the answer to the question whether digital games can be applied for the purpose of learning and teaching as well as creating and presenting different educational contents for students. The aims of the research were to determine the extent to which children use digital games, for what purposes, as well as to describe the attitudes of children regarding the application of digital games for the purpose of learning and functional understanding of different educational contents. In addition to the above, the paper also deals with questions whether and to what extent teachers use digital games for encouraging interactive and digital learning and teaching.

### Theoretical part of the research

Education is not received. It is achieved.
Albert Einstein

The era of modern technologies brings about rapid changes in all aspects of human life, including to a large extent the sphere of education. Learners are no longer passive recipients of information, but they are actively engaged in the exchange of knowledge and experience, participating in the production of the new knowledge. They are aided in this process by their own knowledge of modern technologies and by their computer skills, which have become an integral part of the modern children's life. Learning as the acquisition of knowledge for the purpose of its reproduction has shifted the boundaries of learning to functional understanding of content and information, to critical thinking and, furthermore, the application of the learned content in concrete life situations. Games provide invaluable opportunities for children to learn through imitation, to experience the consequences of their actions and to experiment with different skills and different outcomes without fear (Plummer, 2008). "Games provide players, as learners, with deeply satisfying challenges that require the development of skills and strategies in order to achieve the game objective. Further, when contrasted with traditional views of education, games provide a learner-centered, rather than teacher-centered approach to education. Understanding games in this way opens the possibility for games to move beyond their primary focus within entertainment and explore the new contexts and markets" (Stapleton, 2004).

Games are primarily played for pleasure and fun, but they can also be educational. The aim of the game is to move away the players from reality and transfer them into another reality guided by different rules and behavioural patterns. Educational games are social or computer games that are specially designed to teach their users a certain topic,

guide them to expand certain concepts, strengthen their development, understand a historical event and culture, or enhance the development of certain abilities. Educational video games represent educative computer software and are used as a supplement to traditional teaching process, or as a separate type of distance learning (Yanhong, et al. 2010). Organized children's play, didactically and methodically conceived, provides the possibility of maximum children engagement in various learning activities. At the same time, the game contributes to the acquisition of new experiences, in relation to the environment and peers, as well as exercising and developing children's abilities. Children's interest in the learning content is increasing, they are more satisfied, and they make progress in their development (Ivić, 1997).

Learning through traditional or digital games is focused on spontaneity, self-exploration, reaching conclusions, interactivity, dynamism and creativity, independent or group task solving, in order to overcome some of the requirements of the game and continue with further research, through fun and spontaneous learning. Based on this, it can be concluded that a student in such a learning process has an active role and takes responsibility for his/ her work and content management as well as the acquisition of new skills. In scientific literature, authors illustrate that games represent a specific way of teaching children and youth. Didactical games require intellectual activity and contribute to intellectual development of children. Didactic games are usually games with established rules, which provide the possibility of agreeing and matching rules before or during the game. Didactical games can likewhise include adjusting the established rules to the children's needs; sometimes students can be given the opportunity to create game rules. The game becomes a learning experience in a serious, fun and interesting way (Kopas, 2006). These types of games are used for the purpose of education and learning (Dejić and Egerić, 2006).

#### Didactical and digital games

"Play is a natural childhood activity and a child's imagination is a valuable inner resource which can be used to foster creative thinking, healthy self-esteem and the ability to interact successfully with others" (Plummer, 2008: 13). In addition to influencing the development of cognitive abilities, many authors point out that children games contribute to their social and emotional development as well (Levy 1978; Plummer 2008; Whitebread 2012). In addition to spontaneous games, the other group of games inludes organized, pre-planned, targetoriented activities with clearly set rules, the beginning, progression and completion, such as various social, competitive and sports games (Trebjesanin, 2008). Emil Kamenov states that the phenomenon of the game cannot be covered by a single definition (Kamenov 2009, according to Bruner et. al., 1976). In the interpretation and the definition of the concept of the game, different starting points are standing out - sociological, anthropological, pedagogical, medical, ecological, cultural, developmental and others (Kamenov 2009; Whitebreard 2012).

While playing a game, children explore the world around themselves, find new ways and opportunities to act in different situations, which are usually associated with children's everyday life experiences. Games encourage children to be ready to adapt to change at any time, use different sources of information, explore and experiment in order to find better solutions for solving the same problem (Barr, 2017).

The diversity of computer games has lead to their classification in categories. According to the classification stated by Michael and Chen (Michael and Chan, 2005), digital games can be classified into two groups: informal and educational games. Informal digital games require no special skills of players and have very simple rules. As such, they can be played by individuals of varying ages and interests, and their basic aim is entertainment and amusement of the players. As opposed to them, education-

al games serve the aim of educating, not only entertaining. Similarly to informal games, educational games have simple rules - however, a game incorporates certain information that unconsciously contributes to the enrichment of the knowledge. These games can be used for gaining new knowledge through interactive communication, or for testing the acquired knowledge through interactive tests. A game whose primary aim is education and its secondary aim is entertainment is called a serious game (Clark, 1970). Serious games utilise characteristics which offer students authentic learning experiences, in which entertainment and learning are unobtrusively integrated in a manner that enables their implementation within a wider range of teaching methods. The expansion of digital games and their presence in children's lives have encouraged authors and researchers to explore and demonstrate how digital games can be applied in the area of learning, developing skills and matching certain educational content. This undoubtedly contributed to the increasingly frequent use of the term serious games, which applies to educational digital games (Susi, 2007). Serious games "are the games in which education (in its various forms) is the primary goal, rather than entertainment" (Michael and Chan, 2005:17). A game in which the primary goal is education, and the secondary is fun, is called a serious game. (Clark, 1970). Their initial intention is to combine an element of fun and learning element. An educational digital game is created for the purpose of learning and its goal is to simultaneously combine elements of learning, playing and entertainment. Educational digital games are expected to contribute to an interactive and dynamic learning process, with the aim of a clearer and more functional understanding of different scientific phenomena and/or concepts, as well as encouraging the development of certain knowledge and skills.

### Digital Games in the Function of Learning

The success of learning through play has been confirmed by the fact that learning becomes enter-

taining, while teachers and lecturers are given opportunity to convey their knowledge in a manner that is both interactive and interesting. The basic aim of learning through games is to lead students to learn through research, interactive engagement, mistakes and repetition, in a manner that leads them to become engaged in the game, without being aware of the fact that they are also learning at the same time. (Okan, 2003) In the teaching practice, teachers can use educational digital play as a motivational introduction to a new content, as an additional activity, in order to encourage student interaction with content, as well as motivation for learning. Research confirms that serious games greatly contribute to increasing motivation for learning (Papastergiou, 2009; Huang, 2011) and they encourage student efficiency and effectiveness in learning (Wang and Chen, 2010).

The authors emphasize the importance of the application of educational digital games with children in order to master the skills of the twenty-first century, emphasizing that digital games contribute to active learning and functional acquisition of knowledge (Romero, et. al 2015). Bar points to the importance of digital games in the development of students' academic skills (Barr, 2017). Educational digital games are specially designed to teach users specific topics, expand concepts, strengthen development, contribute to the understanding of historical events and culture, or contribute to the development of certain player abilities (Yanhong, 2010). Serious games are innovative tools that are widely recognized as having considerable potential to support active learning. These games use game characteristics to provide learners with an authentic learning experience where the entertainment and learning are seamlessly integrated (Gee, 2003).

To sum up, games are voluntary activities, obviously separate from real life, creating an imaginary world that may or may not have any relation to the real life, and they require the player's full attention. Games are played within a specific time and at a spe-

cific place, they are played according to established rules, and create social groups out of their players. The aim of the game is to remove the players from reality and transfer them into another reality guided by different rules and behavioural patterns. Games are primarily played for pleasure and fun, but they can also be educational. Games in general, and video games in particular, are now in the process of proving their effectiveness as tools of training and teaching.

#### Methodological part of the research

The aim of the research was to explore how children use digital games in everyday life, for what purpose and at what level. Furthermore, the research results provide the answers of children aged 10-12, indicating the extent of using digital games at schools or for educational purposes. The conducted research was done by using the descriptive method, and the survey questionnaire was the measuring instrument.

There were 308 participants in total, 155 female, and 154 male children. Students were from different schools, public national (227 participants) and private international schools (81 participants) in Serbia. The data obtained by the survey questionnaire were processed, analyzed and presented qualitatively and quantitatively by presenting the tables, charts, frequencies and percentages, and describing the obtained results. The results of the research are presented in three parts: The level of using digital games; reasons and motives for playing digital games; the application of digital games for the purpose of teaching and learning.

# Level of Using Digital Games

The analysis and presentation of the obtained results can be an incentive for teachers, educators and parents to reflect on the degree of presence of digital games in the children's world and to direct children to the functional and quality use of them.

The data obtained show that all surveyed children (all respondents) play digital games to some extent. It is interesting that no respondent in the survey questionnaire chose the answer "I do not play digital games". This should be an imperative for adults and professionals in the field of child development and education, to discover new issues and to find effective and functional games and/or ways of using available digital games.

Table 1: Level of using digital games – all respondents

I play digital games	f	%
Every day in a week	114	37.01
Two or three times a week	105	34.07
Once a week	21	6.81
Rarely	68	22.08
Not at all	0	0.00
All results	308	100.00

The results show that 37.01% of all respondents claim that they play digital games every day, 34.07% two to three times a week, 6,81% once a week and 22.08% of all respondents claim that they rarely play digital games. None of the tested respondents stated that they did not play digital games. It was noted that the majority of the respondents answered that they played digital games daily or two to three times a week, while the smallest number of the respondents pointed out that they played digital games once a week, or that they did not play the games at all.

Table 2: Level of use of digital games by respondents – male and female respondents

I play digital games	M	ale	Female	
	$\overline{f}$	%	f	%
Every day in a week	66	43.13	47	30,32
Two or three times a week	57	37.26	50	32.25
Once a week	7	4.58	14	9.03
Rarely	23	15.03	44	28.38
Not at all	0	0.00	0	0.00
All answers	153	100	155	100

By analyzing the results of the responses received from boys and girls, it was concluded that a higher percentage of boys (43.13%) stated that they played digital games daily, while 30.32% girls offered the same response. According to the research results, a higher percentage of girls (28.38%) claim that they play digital games rarely, while in boys this percentage is lower than 15.03%. Compared to girls, a higher percentage of boys stated that they played games two to three times a week, but it was observed that the difference in the percentage is not significantly high (boys 37.26%, girls 32.25%). Regarding the answers that indicate that children play digital games once a week, the boys' responses amounted to 4.58%, while the girls' answers amounted to 9.03%. None of the male or female respondents indicated that they did not play digital games at all. Finally, both the analyses of all the respondents and of male and female responses separately confirm that a greater percentage of the respondents claim that play digital games in comparison to the respondents who do not play digital games.

The analyses of the responses from all respondents, as well as of the responses of boys and girls respectively, undoubtedly indicate that the frequency of playing digital games is very high. Such a result raises a question of how parents, educators and teachers can direct children towards functional digital games. Firstly, it is necessary that they themselves should be digitally literate, informed and trained on the possibilities, types, characteristics and the adequate use of digital games by children. The main aim of all who are involved in the development and/or education of children is to take advantage of digital games when they are used by children and to reduce possible negative effects of digital games on children.

# Reasons and Motives for Playing Digital Games

The analysis of the results showing the reasons and motives for playing digital games indicates

that entertainment is the main reason why children play digital games.

*Table 3: Reasons and motives for playing digital games – all respondents* 

I play digital games	f	%
to have fun	234	75.97
to learn something new	56	18.19
to socialize and have fun with friends	18	5.84

Out of three hundred and eight students (f = 308), two hundred and thirty four (f = 234) point out that they played digital games for entertainment. The answers given by the boys and girls respectively are approximately equal. The main difference in the male and female answers was observed regarding the question indicating that they play digital games to socialize with their peers. The 11.12% of boys said that they played digital games to socialize with their peers, while the percentage of the same answer among the girls was 1.93%. Compared to male respondents, a slightly higher percentage of female respondents stated that they played games to learn and master a new educational content.

Table 4. Reasons and motives for playing digital games – male and female respondents

I blan dicital campa	Male		Female	
I play digital games	f	%	f	%
to have fun	110	71,89	123	79.36
to learn something new	26	16.99	29	18,71
to socialize and have fun with friends	17	11.12	3	1.93

The analyzed results confirm that the main reason for playing digital games is entertainment. The percentage of the respondents stating that they play digital games to find and master new educational content is also significant. Based on this, it is important for children in modern education that teachers and parents find the most effective ways of using digital games for the purpose of education and development of children's digital, cognitive, emotional, and social skills. All the research results in-

dicate that training and improvement of teachers for creating digital games should be encouraged to enable children to master new and revise the wellknown educational content with the primary goal that learning should be fun, functional, unconscious, constructive, and based on play.

# The application of digital games for the purpose of teaching and learning

The researchers analysed answers to the question whether and to what extent teachers use and

encourage using digital games for presenting and learning educational contents. The results of the research also describe children's attitudes to using digital games for educational purpose at schools. In this part of the research we have two different variables - answers from all of the respondents and answers from the respondents from public and private schools.

The following results were obtained in response to the question focusing on the application of digital games in teaching for the purpose of mas-

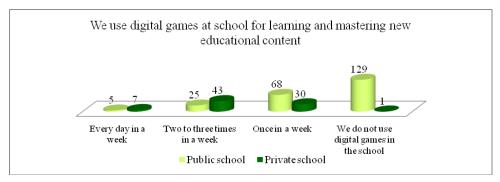


Chart 1: We use digital games at the school for learning and mastering new educational content – respondents from public and private schools

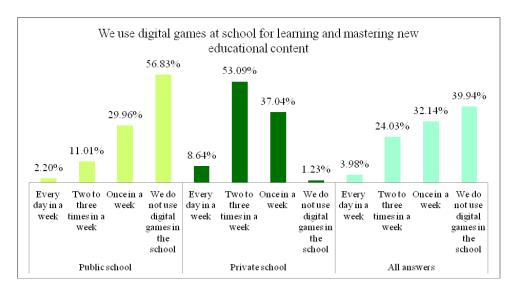


Chart 2: We use digital games at school for learning and mastering new educational content – answers from all the respondents

tering new material - 39.94% of the respondents state that they do not use digital games in the classroom while 60.06% of the respondents claim that they more or less use digital games at school. Analyzing the obtained data, it can be seen that 56.83% of the state school respondents state that they do not use digital games in the classroom, while only 1.23% of the private school respondents confirm this claim. The above data clearly indicates a significantly higher percentage of the use of digital games in private than in public schools. The claim that digital games are used two to three times weekly is stated in 53.09% of the answers provided by respondents from private schools, compared to 11.01% of affirmative answers to the same question provided by the respondents from state schools.

When we talk about children's attitudes to whether digital games are used to revise educational content, the results are shown in the table (*Table 5*):

*Table 5. We use digital games at school for revising teaching content – answers by respondents from different schools.* 

We use digital games at school for revising teaching content	Public schools		Private schools		All respondents	
<ul> <li>answers by respondents from different schools.</li> </ul>	f	%	f	%	f	%
Every day in a week	23	10,13	12	14,81	34	11,04
Two to three times a week	27	11,90	41	50,62	68	22,08
Once a week	64	28,20	22	27,16	86	27,92
We do not use digital games at school	113	49,77	6	4,41	120	38,96
All answers	227	100	81	100	308	100

From the table (*Table 5*) it can be observed that there is a significant difference in the responses from pupils of private and public schools regarding the use of digital games for the revision of the learned educational content. Can the higher level of technical equipment of state schools, as well as the reorga-

nization of lessons with fewer students contribute to reducing the existing difference in responses of students from public and private schools as regard the use of digital games in teaching? Can teacher training actually contribute to the stated goal, so that the children of state and private schools are not exposed to such greatly different routines in terms of the use of digital resources at their schools? These are all issues that open up new questions for further consideration, and for which the survey was conducted, as only one step, or an introduction to possible further explorations. The conducted research aims to provide data on whether and to what extent teachers give students examples of useful and functional educational digital games. The results are presented graphically (Chart 3, Chart 4).

The obtained results confirm that there is a significant difference in the use of digital games between state and private schools. The obtained results can be related to better technical equipment of private schools and a smaller number of students in them. The presented results show a big difference in the application of digital games in teaching and learning in public and private schools, so a new question arises: how to reduce the differences and enable contemporary and digital education for students in public schools?

The research also examined students' attitudes to the application of digital games in the classroom. The results show that children gave positive answers in 73.05% of the cases, while 26.95% of the answers were negative.

Based on the results of the survey, it has been confirmed that among children there is a prevailing attitude regarding the use of digital games for the purpose of education. It opened more questions for research: what types of digital games ought to be involved in the education process and at what level, what is the methodological aspect of it, and how to bring educational content closer to everyday activities and contemporary interests of children and young people nowdays.

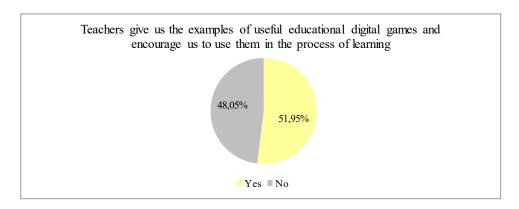


Chart 3. Teachers give us the examples of useful educational digital games and encourage us to use them in the process of learning - all respondents

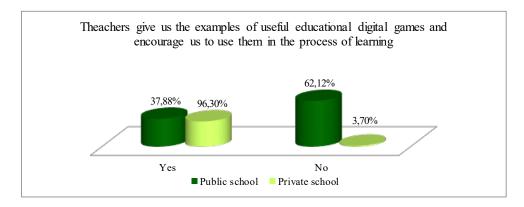


Chart 4. Teachers give us the examples of useful educational digital games and encourage us to use them in the process of learning — respondents from public and private schoos

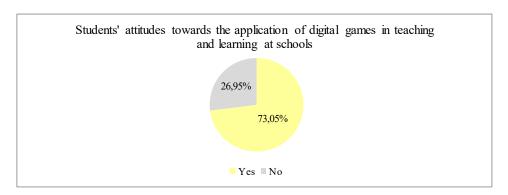


Chart 5. Students' attitudes towards the application of digital games in teaching and learning at schools – answers of all the respondents

#### Conclusion

The development of information and communication technologies has affected the processes of learning and instructing, as well as the mode of creating the education strategy. The changes in the methods and procedures of knowledge transfer and knowledge adoption followed by the implementation of computers and modern digital media occur at an increasing rate. In order to increase the efficiency of learning and instructing, it is necessary to enrich the education process with attractive and interactive contents, which will involve students as active participants. Learning through playing games, traditional or digital, is just one of the methods that lead to the achievement of the aforementioned ideas and encouraging the students' activity and interaction with learning materials.

A survey conducted in 2018 with three hundred and eight students of the third and fourth grade of the primary school had the aim to demonstrate

the extent to which children play digital games in their free time as well as for the purpose of learning and understanding different educational contents. The survey showed that the respondents are mostly motivated and interested in learning a given content through playing digital games. The results indicate a higher level of using digital games in private schools than in public schools. The reason for this could be better technical equipment in private schools, as well as a smaller number of students. The research confirmed that one hundred percent of the respondents play digital games during their free time, which emphasizes the importance of the question of how to make children use digital games in a functional and educational way.

Teachers and parents, as well as experts in the field of education, should continue to deal with the fundamental question of functional and educational use of digital games, so that child development and education are productive, healthy and of high quality, while also fun at the same time.

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#### УЛОГА ДИГИТАЛНИХ ИГАРА У ЖИВОТУ ДЕЦЕ

Како у шрадиционалном, шако и у савременом йрисшуйу учењу и йодучавању, ијра се йосмашра као њихов најйрироднији облик. Иїра дойриноси сйоншаном учењу, иншеракшивносши и динамичносши йриликом усвајања нових садржаја и развоја сйособносши. Савремено доба изнедрило је диї ишалну врсшу иїре, која данас све више исйуњава свеш деце и младих. Прелазак са шрадиционалних на диїишалне иїре йодсшакли су савремено доба и енормно брз развој информационо-комуникационих шехнолої ија. Деца и млади данас све више корисше диї и шалне и ї ре, како у слободно време, у сврху забаве и разоноде, шако и ради усвајања нових знања и вешшина. Како су дигишалне игре све йрисушније међу децом, све је учесшалије йишање да ли се и на који начин оне моѓу йримениши у сврху учења и йодучавања? У раду су йриказани резулшаши емйиријскої исшраживања сйроведеної са ученицима шрећеї и чешвр-<u> ѿої разреда основних школа на шеришорији Србије. Узорак исшраживања обухвашио је шри</u> сшошине осам исйишаника из различиших основних школа, обухвашајући, како аржавне, <u>шако и йривашне школе. Добијени резулшаши су йоказали да исйишаници у 100% одговора</u> исar uичу да иar pају диar uиar uалне иar pре, у највећој мери ради за $\delta$ аве и разоноде, али незанемарив је йроценай оних који указују да диїийалне иїре корисйе у сврху ойкривања и усвајања нових садржаја и знања. Исшраживање је указало на значајан раскорак у уйошреби и йодсшицању ученика на учење йушем диїишалних иї ара у йривашним и државним основним школама. Иншересаншан је йодашак који їовори у йрилої свеойшшој мошивисаносши ученика за овакав вид учења и обнављања насшавних и других образовних садржаја, што отвара даља йишања — како дигишалне игре йрилагодиши насшавном йроцесу и укључиши их у йроцес исшраживања, ошкривања и усвајања нових садржаја, кроз разумевање, иїру и сйоншаносш?

**Къучне речи:** деца, образовање, учење, диї и шалне и тре, и тра.