



Geliş Tarihi/Received: 28. 12. 2021 Kabul Tarihi/Accepted: 15. 05. 2022 DOI: 10.5281/zenodo.6883134

## THE EFFECT OF GAME BASED LEARNING APPROACH ON PRESCHOOL STUDENTS' LEARNING PREFERENCE

 Alper EYİNÇ

Sivas Cumhuriyet Üniversitesi, Yıldızeli Meslek Yüksekokulu, Çocuk Bakımı ve Gençlik Hizmetleri Bölümü – E-Posta: alpereyinc@cumhuriyet.edu.tr

 Ali Osman ENGİN

Atatürk Üniversitesi, Kazım Karabekir Eğitim Fakültesi, Eğitim Bilimleri Bölümü – E-Posta: aliosman.engin@atauni.edu.tr

### ABSTRACT

Game Based Learning is the approach where digital games are truly included in the classroom. These games often encourage students to be more involved in the teaching process by stimulating their interest and increasing their motivation towards a particular subject. Game Based Learning facilitates teaching by using a computer game to teach a subject. By using these games in education, students are expected to gain courage in their critical thinking skills and problem solving skills. The main purpose of this research is to examine the effect of the game-based learning and teaching model on the learning preferences of preschool children, theoretically and practically. Semi-structured interview form and observation form were applied to the study group of the research. In the analysis of the data, the Shapiro-Wilks score of the items in the observation form created for the learning preferences of the children was examined in terms of normality. According to the normality tests, it was observed that the items in the observation form were not normally distributed. The Mann-Whitney U test was used to compare the scores of the children in the experimental and control groups, and the Wilcoxon signed-rank test was used to rank the pre-test and post-test scores of the groups in the prepared learning preferences comparison observation form. Descriptive and content analysis methods were used in the data obtained from the semi-structured interview questionnaire. As a result of the research, it is seen that there is a significant difference in favor of the posttest between the pretest-posttest results regarding the learning paths preferred by the children ( $z=-6.042, p\leq 0.05$ ). From this point of view, it can be said that the experimental group in which the game-based learning-teaching model was applied contributed to the learning paths preferred by the children. There was no significant difference between the pretest-posttest scores of the children regarding their preferred learning paths ( $z = -5.854, p > 0.05$ ). In short, the activities carried out under the current education program did not have any effect on the learning paths preferred by the children.

**Keywords:** Game, learning with game, game based learning, pre-school education

## OYUN TABANLI ÖĞRENME YAKLAŞIMININ OKUL ÖNCESİ ÖĞRENCİLERİNİN ÖĞRENME TERCİHLERİNE ETKİSİ

### ÖZET

Oyun Tabanlı Öğrenme dijital oyunların sınıf içerisine gerçekten dahil olduğu yaklaşımdır. Bu oyunlar genellikle belli bir konuyla ilgili öğrencilerin ilgilerini çekerek ve motivasyonlarını artırarak ders sürecine daha fazla dahil olmalarına imkân tanır. Oyun Tabanlı Öğrenme bir konuyu öğretebilmek için bir bilgisayar oyununun kendi avantajlarından faydalanarak o konunun öğretilmesinde kolaylık sağlar. Bu oyunları eğitim ortamında kullanarak, öğrencilerin kritik düşünme becerilerinde ve problem çözme becerilerinde cesaret kazanmaları beklenir. Bu araştırmanın temel amacı, oyun tabanlı öğrenme ve öğretme modelinin okul öncesi

çocuklarının öğrenme tercihlerine etkisini teorik ve uygulamalı olarak incelemektir. Araştırmanın çalışma grubuna, yarı yapılandırılmış görüşme formu ve gözlem formu uygulanmıştır. Araştırmada verilerin analizinde çocukların öğrenme tercihlerine ilişkin hazırlanan gözlem formunda yer alan maddelerin normal dağılım gösterip göstermemeye durumu için Shapiro-Wilks değerine bakılmıştır. Normallik testleri doğrultusunda gözlem formundaki maddelerin normal dağılım göstermediği görülmüştür. Öğrenme tercihleri ile ilgili hazırlanan gözlem formunda deney ve kontrol grubundaki çocukların puanlarını karşılaştırmak için Mann Whitney U-Testi, grupların kendi içindeki ön test ve son test puanlarını karşılaştırmak için ise Wilcoxon İşaretili Sıralar Testi uygulanmıştır. Yarı yapılandırılmış görüşme formundan elde edilen veriler içinde betimsel ve içerik analizi yöntemi kullanılmıştır. Araştırmada sonucunda, çocukların ön test-son test tercih ettikleri öğrenme yollarına ilişkin puanları arasında anlamlı farklılığın son test lehine olduğu görülmektedir ( $z=-6.042$ ,  $p\leq 0.05$ ). Buradan hareketle, oyun tabanlı öğrenme-öğretme modelinin uygulandığı deney grubu çocukların tercih ettikleri öğrenme yollarına katkı sağladığı söylenebilir. Çocukların ön test-son test tercih ettikleri öğrenme yollarına ilişkin puanları arasında anlamlı farklılık görülmemiştir ( $z = -5.854$ ,  $p > 0.05$ ). Kısacası mevcut eğitim programı kapsamında yürütülen etkinliklerin çocukların tercih ettikleri öğrenme yolları üzerinde herhangi bir etkisi olmamıştır.

**Anahtar Kelimeler:** Oyun, oyun ile öğrenme, oyun tabanlı öğrenme, okul öncesi eğitim

## INTRODUCTION

If human life is periodized as infancy, childhood, youth, adulthood and advanced adulthood, some of it can be viewed as development and preparation for life, some as productivity-productivity, and some as evaluation period. Humans are the only creatures among living things who reveal and use their abilities and skills in various ways, and who can express their thinking and thoughts by organizing them (Bayırtepe and Tüzün, 2007). From the moment they are born, children try to make sense of their environment and explore life by interacting with the environment, observing, touching and even doing research (Akbayrak and Turaşlı, 2017).

Considering that it is one of the creatures with the most and long-term dependence on the beings that brought it to the world, it is just as difficult to get used to and adapt to its new environment. One of the most important skills for survival and adaptation is learning and applying what has been learned in an appropriate way (Aksoy, 2014). Assuming that knowledge is infinite, objects, events, situations and facts needed in life may need to be learned throughout life. Mankind has realized the natural or created different unnatural ways for both learning and adapting to the living place and transferred them to the next generations (Aral et al., 2001). Play is an activity that takes place in human life, although it has different forms and scopes throughout life. In this respect, it can be seen as a natural learning and relaxation method in adulthood and old age.

Assuming that the game emerged with the existence of humanity, it can be claimed that it has been shaped by different perspectives in the historical process due to reasons such as adults' view of children, economic and social conditions, natural disasters, war and similar disasters. The game, which was considered as important as work in the preparation of young generations for life, was accepted as an occupation that was integrated with work in the Middle

Ages, helping both children and adults to gain skills, relax and get to know the world (Büyüköztürk, 2013). From the eighteenth century, and especially in the nineteenth century, social consciousness developed and childhood and play began to be viewed as an important and distinct aspect of development. Time will tell how the industrialization and digitalization that started in all aspects of life in the twenty-first century will affect the child and the game (Çakır and Akbaş, 2013; Gözalan and Koçak, 2014; Özyürek and Çavuş, 2016). In the first years of life, activities such as noticing, perceiving, understanding, using, arranging, redesigning and unfortunately destroying the environment begin to be done in many ways with a framework that expands starting from one's own body. When infancy and childhood are observed, it can be understood that one of the natural ways is play based on imitation and recognition experiences (Cheung, 2018).

In fact, learning through play is a method that has the potential to include all other methods (Avcı et al., 2009). Teachers should be able to use all approaches in-game or in structured activities. The interests, wishes and needs of the children who will be educated in game-based learning are at the center of the learning process, thus ensuring the interaction of the children in the processes, their enjoyment of learning and the use of all their senses (Bayırtepe and Tüzün, 2007).

Sufficient knowledge has been accumulated with the ideas of thinkers such as Aristotle, Quantilianus, Comenius, Locke, Pestalozzi, Rousseau, Fröebel, Montessori, Dewey, Piaget, Vygotsky, who benefited from their views on the game in the historical process (Roskos and Christie, 2007; Şaşmaz and Erduran, 2004). That is to say, while the necessity and benefits of the game were tried to be justified before, in the last stage, the cognitive aspect with Piaget and the social and cognitive aspect with Vygotsky have now indisputably determined the place of the game in human life. From now on, the role of play in the formation of the mind, the formation of the self, the definition and reproduction of culture has begun to be discussed (Mutlu and Aydoğdu, 2003).

The first years of life include experiences that develop from addiction to independent action, where needs are met by an unknown person in an unknown world under normal circumstances. What is natural in these experiences is that the baby or child makes discoveries, engages in different configurations and experiments, and uses their senses effectively (Wood and Atfield, 2003). These conditions are also very important in terms of physical and mental health. Although it is encountered in different ways in different societies, some adults often

forget their own childhood and reflect the natural state of children as a negative perception by labeling them as spoiled and naughty about the children they care about or observe (Pilten and Pilten, 2003). While the image of the child is questioned in many ways, play, which is the most important method used by him in perceiving the world, is also taken into consideration. The fact that many expressions such as children's play as a discourse, like a child, playing a game changer have been developed can be expressed as the inability to understand children's games that seem useless from an adult's point of view (Walsh et al., 2017). However, the game is a process-oriented method rather than result-oriented. The fact that adults think of children in their own judgment and experience causes the image of the child to be formed as unhealthy as the meanings they attribute to the game and toy. One of the main reasons for this situation is that the image of the child and the game in the minds is not formed sufficiently consciously and healthily (Turgut and Yılmaz, 2010).

The main purpose of this study; to examine the effect of the game-based learning and teaching model on the learning preferences of preschool children theoretically and practically. The study mainly consists of 6 chapters. In the second part of the study following the introduction; game-based learning theoretical framework has been created, in the third part; the effect of the game-based learning approach on the learning preferences of preschool students has been examined, in the fourth part; the method part of the research was formed, in this context, the problem area of the research was determined, the research model was designed, the study groups were determined, the data collection tools for the application were determined, then the data analysis was started. The findings obtained as a result of the analysis were included and interpreted. In the last part, the sixth part, the study was completed with the conclusion and evaluation parts.

#### **Game-based learning theoretical infrastructure**

Today, for individual success and happiness, and considering all social systems, it is stated that the ideal person should have the skills defined as the lost first century skills. The influence of the developmental basis laid by the games played in early childhood in the acquisition of many skills listed as the twenty-first century skill is undeniable (Mann et al., 2002). Children, who will become productive and effective individuals with these skills, will become individuals with high personal, social and scientific awareness and sensitivity, thanks to learning through play from an early age.

Game experiences also contribute to the development of social skills such as productivity, verbal intelligence, perspective development, language development and speaking skills, as well as cooperation and stimulus control. From a holistic perspective, play is an activity that contributes significantly to the development of the child's physical, mental, social, emotional, language and self-care skills (Kirriemuir and McFarlane, 2004). Play, which should be one of the basic principles of child-centered programs, also contributes to the awareness of the individual's interests, wishes and needs in terms of predicting the interaction of the child with the guide only when needed.

While children make their time productive by playing games, they lay the foundation of knowledge, skills and habits that will build their future (Bottino et al., 2006). On the other hand, the maturation process of the individual is also delayed due to the inaccuracy of adults' perspectives on the play method and the delay of life experiences in cases where the interaction and guidance needed is insufficient. Because children acquire new knowledge, use their old knowledge, and rearrange and structure their knowledge through play. The delay in these experiences affects success in life in general (Garris et al., 2002).

### **Learning with play**

For children, the game is a fun pastime. It can be said that games are a fun activity not only for children but also for students of all levels. If the concepts that are wanted to be taught to children or students are included in these fun activities, they can learn while having fun. It is known that preschool or primary school children need activities that will spend their energy when it is thought that their mobility is at a high level. Games allow children to discharge their energy and develop their muscular system (Mann, et al., 2002). Children's mistakes, omissions or correct actions during the game give them experience. If we give an example of this situation; children learn to be careful during the game process so as not to make mistakes. It is stated that students are able to focus their attention in the first fifteen minutes of teaching and then have difficulty in concentrating. Thanks to games, students can become active by concentrating their attention on the relevant concept (Tüzün et al., 2008).

In both cases, it can be said that learning can be easier. Games are environments that enable the effective realization of social skills. These skills can be learned spontaneously during the game. Students or children learn skills such as speaking, sharing, helping each other and human relations by interacting with their environment and friends during the game. For them, games are a learning and development environment (Avcı et al., 2009). Learning with games

can involve even students with low motivation and apathy towards the lesson. In line with the achievements, placing games in activities in learning environments is important in terms of arousing interest and providing attention. In this case, the use of games in learning environments will motivate students towards the lesson or concept and enable them to take an active role (Bayırtepe and Tüzün, 2007).

Considering that competitions or different activities within the games increase motivation, the disappointment experienced by the students who lost in the competitions can also lead to the emergence of negative emotions. In this case, the important thing is that the games suitable for the interests of the students are selected or designed and used in the learning environment (Bakar et al., 2008). A student who is interested in the game can develop the ability to focus on the subject while teaching the subject with the game. Then, using the game as a learning tool can make learning easier. As stated in the study of Saban (2000), emotional conflicts can be resolved and social structures in society can be internalized through games. Starting school should not mean that the game is over, it should change its form according to its developmental characteristics. For students, the concepts of play and learning are not opposites of each other, even they are directly proportional to each other. Students prefer to learn by playing games and having fun in learning environments (Dönmez-Usta and Turan-Güntepe, 2016). In fact, students of the new millennium prefer educational computer games more with the rapid development of technology. In this context, according to the results obtained from scientific studies, it is recommended that educators design or use activities based on game-based learning in learning environments (Garris et al., 2002).

### **Game based learning**

Game-based learning environments are created by placing the previously designed problem into scenarios. In game-based learning environments, students create problems, develop solutions to solve this problem, and try to solve the problem with the solution they use (Melendez et al., 2000). Thanks to game-based learning environments, students have a good time in learning environments and have the opportunity to reinforce concepts. In fact, game-based learning can make learning environments fun and attractive by freeing students from the boringness of the current classroom environment (Çelebi-Öncü and Özbay, 2005).

Considering that new generation students cannot imagine a world without computers, internet and even computer games, learning environments with computers, internet and even computer games should be created in order to meet the needs of these students. At this point, it

is important to use educational computer games in the learning environment. The fact that educational computer games increase the motivation of students and make them eager for the lesson requires the effective use of these games in educational environments. This situation has attracted the attention of educational researchers and studies on educational computer games and the effectiveness of these games have been among the subjects studied in recent years (Çelebi-Öncü and Özbay, 2005).

In studies on the use of educational computer games in learning environments, it is stated that these games make learning environments fun, students try to solve the problems they encounter during the game process, and contribute to the development of thinking and reasoning skills (Boyraz and Dolunay, 2014). In addition, it is stated that social communication, thinking and technology concepts contribute to learning together by creating different worlds thanks to educational computer games. In this case, the use of educational computer games and therefore digital game-based learning environments in the education process becomes inevitable.

Princeky (2001) in digital game-based learning environments, students willingly participate in the learning environment. And also; many different types of educational computer games such as strategy development or action can contribute to students' latent learning. In this context, students learn unknowingly by having fun while playing the game. Similarly, latent learning can happen when designing a game. The use of both games and educational computer games within the scope of game-based learning in the education process requires a serious preparation process (Lim et al., 2006). The motivation of the students during the games may cause anxiety in the other students who play the game. For this reason, it is necessary to know the characteristics of the sample in which game-based learning will be used, to use games that will reduce inter-individual differences, and to choose games according to grade level. It is known that the games are guiding and teaching, making the environment fun by saving it from boring (Kirriemuir and McFarlane, 2004). The use of game software in learning environments can improve students' problem-solving skills and make learning easier. For this reason, integrating digital game-based activities into learning environments is important to make the process effective. In this context, game programs that can be used during game preparation and use in learning environments are listed below (Çankaya and Karamete, 2008).

### **Game based learning environments**

According to Shaff et al., (2005), computer games are an excellent learning tool. Because computer games give students the chance to adjust the difficulty of the game and the user can

play the game as much as he wants whenever he wants. Game based learning environments create game based problem-based learning environments embedded in specific problem scenarios. In game based environments, students create their own problems, collect the necessary information for the solution, and solve the problem (Özyürek and Çavuş, 2016). An additional benefit of learning with games is that they are more suitable for simulating situations that may be encountered in everyday life than traditional educational tools. With this aspect, game-based learning environments are a suitable bridge between theory and practice. (Mutlu and Aydoğdu, 2003). Users can fearlessly achieve real-life results with simulations. Therefore, they are used in critical application areas such as medicine and engineering.

Stating that the use of games in schools will increase, Melendez et al., (2000) show the real importance of well-designed computer and video games as people re-creating themselves in virtual worlds within games and having both fun and learning simultaneously. Swindells and Stagnitti (2006) emphasize that games provide important gains such as strategic thinking, planning, communication and decision making. Similarly, Landreth et al., (2006) argue that game-based learning environments create new social and cultural worlds and this helps learning through combining thinking, social communication and technology. Rapid socio-cultural, economic and technological developments, new developments and inventions in the field of science, developments in human rights have led to an increase in expectations from education and have forced traditional education to change for the benefit of the individual. With the introduction of computer technology into education, it has been realized that computer games are one of the entertainment centers of school-age children (Gözalın and Koçak, 2014)

It turns out that these games not only enable children to have fun, but also enable them to learn something. The materials made to ensure that students both have fun and learn something while having fun created game based learning environments (Ülküdü and Bacanak, 2013). It is an undeniable point that game-based learning environments arouse students' curiosity towards learning and motivate them to learn by increasing their motivation. Game based learning environments have a structure that helps students develop their skills and carries knowledge patterns specific to the subject area they are prepared for. In addition to the ability of game-based learning environments to provide students with the opportunity to have a good time, there is also an instructive and reinforcing feature in the activity that takes place in the game (Shaffer et al., 2005).



On the other hand, the use of these educational games in education can make the education process fun and attractive for children by overcoming the boringness of traditional classroom environments. Educational games can be used to achieve the goals in the curriculum. In the light of this information, the problem statement was determined as the effect of game-based learning environments on student achievement and opinions (Ülküdüür and Bacanak, 2013).

### **Game based learning approach**

Game Based Learning is the approach where computer games are really included in the classroom. These games usually allow students to be more involved in the lesson process by attracting their interest and increasing their motivation on a particular subject (Özyürek and Çavuş, 2016). Instead of giving a badge or award, Game Based Learning makes it easier to teach a subject by taking advantage of a computer game to teach that subject. By using these games in the educational setting, students are expected to gain courage in their critical thinking skills and problem solving skills. The game, which is an entertainment tool for children, has an important effect on the education and training process (Landreth et al., 2006). In the education of children, the most appropriate method and technique in terms of age and development level is the game that expresses learning by having fun.

Play is often preferred as a teaching method by families and educators, as it contributes to the child's physical, emotional, social and cognitive development (Roskos and Christie, 2007). Although it is known that play is effective in helping young children gain behavior, play provides significant advantages to all age groups when designed and applied in accordance with the purpose. Play has been defined as activities that develop individuals' physical and mental abilities, make life enjoyable, and develop artistic and aesthetic qualities and skills. Games that are especially aimed at learning and used in the classroom for a specific purpose are called educational games (Şaşmaz and Erduran, 2004). Educational games, games that reinforce the learned information and develop mental abilities, ensure that what is learned is repeated in a cheerful and comfortable environment and bring a change to classroom work. Learning environments dominated by educational games are called game-based learning environments (Walsh et al., 2017).

Game-based learning environments are similar to game-based problem-based learning environments embedded in specific problem scenarios. Games bring to the learning environment features such as unknown result, different solutions to a goal, cooperation, race

and luck, which are important elements of problem solving (Turgut and Yılmaz, 2010). Game-based learning environments offer significant advantages to both instructors and learners. Instructors can use the instinct to play, which is dominant in individuals of all age groups, especially in children, as a tool to achieve educational goals. This type of learning environment allows students to have a good time while improving their skills. Research shows that when used effectively, game-based learning environments increase learning, motivation and self-efficacy; reveals that it reduces the level of stress and anxiety (Avcı et al., 2009). It is seen that there are similar studies examining the effects of game-based learning environments in various disciplines in the literature. For example, it is noteworthy that studies on game-based learning environments are carried out in foreign language, mathematics, computer, science and technology and social studies teaching. Studies that differ in terms of discipline areas converge on important variables of the learning teaching process such as academic achievement, attitude, self-efficacy, motivation and anxiety. It is seen that academic success, as the main variable that the education process aims to develop, has an important place in studies examining the effect of game-based learning environments (Garris et al., 2002).

While some studies have revealed that game-based learning environments have a significant effect on success, others have found the opposite. At this point, the findings of a single study are insufficient to reach a definite judgment on the subject. Based on the findings of the studies on the subject, meta-analysis studies conducted on a larger sample are considered important in terms of generalization. Play, which is the lifestyle of all individuals born from the first people, can be positioned as a baby or child's profession by using it instead of professions, which is one of the most important occupations of adults in daily life (Shaffer et al., 2005). Because the game, which is used while meeting all of his physical and spiritual needs apart from sleep, is the first natural learning method of every person. At all stages of the day; the game that the child uses while he is in bed, feeding, cleaning, exploring his body, messing around, getting to know people, and falling asleep becomes the child's profession (Tüzün et al., 2008).

Although it is very broad when viewed holistically, the materials and toys used by children can be defined as occupational tools. Every child can learn, albeit in different ways and at different rates. Children are born with unique learning abilities and capacities. In the education to be given to children, teaching methods and learning processes that will make learning effective and efficient should be made functional (Avcı et al., 2009). As accepted in many parts of the world, the most appropriate learning method for early childhood children in

Turkey is play. For this reason, all activities, whether informal or formal, should be game-based. This situation is stated in this way in the basic principles of preschool education specified in the current preschool education program, as in previous programs (Yiğit, 2007).

Play is a method that can be defined from different perspectives within different disciplines, even within the same discipline. It is quite difficult to make a holistic definition when considering early childhood education (Yeşilyaprak, 2003). It is difficult to fit all aspects of such a concept, which can be used both informally and formally in the life of the target audience and supports all development areas, in one definition. Despite all the difficulties, especially in terms of early childhood, play: Contributing directly or indirectly to all developmental areas of the child; it can be defined as a life style based on learning that can be realized with or without purpose, with or without rules, with real or model materials, with a free or structured environment and time, in which there is voluntary participation and entertainment in all conditions (Melendez et al., 2000).

Play is the child's specialty. Play is an opportunity to solve problems. Play is a childhood and human right. Play is health; nourishes the body, mind and spirit (Shaffer et al., 2005). The game is an environment of peace where freedoms are experienced. Play is a universal, individual and contextual process. Play is a chance for children to benefit from each other and their environment. Play is the child's self-discovery and development process and action. Play is the source of creativity and the concrete expression of the child's choices and decisions. (Sezer and Şahin, 2016). Game development itself is also a supporter of development. Play is serious business and action that occurs in natural and structured environments to make life safe, meaningful and enjoyable. In addition to many definitions in the literature, common expressions within these definitions can be given as follows:

- ✓ All development areas of babies or children are supported directly or indirectly through play.
- ✓ There may be a logical purpose in the game as well as a situation that only the player can express.
- ✓ Play consists of activities that focus more on the process than the outcome.
- ✓ Babies or children are involved in the game with an internal rather than an external motivation or they play.
- ✓ Babies or children set up or participate in the game according to their wishes and continue.

- ✓ All objects, situations, feelings, events and perceptions used in the game are personal; they can be real or surreal, unrestricted (Melendez et al., 2000).

Pleasure and satisfaction are essential in every situation in the game, but the game where both fun and learning takes place is very important in terms of education. In order for an activity to be defined as a game from another perspective; it was stated that it should have characteristics such as intrinsic motivation, free choice, fun and positive affect, inaccuracy and process rather than product (Swindells and Stagnitti, 2006). It can be said that the relationship between children and play is idealized here. However, it can be said that the poor quality of the environments offered to children always differentiates the level of play's contribution to pleasure and development. For example, the quality time the family spends with the child can increase the child's satisfaction through play and the level of contribution to development areas (Shaffer et al., 2005).

### **The effect of game based learning approach on preschool students' learning preferences**

The strongest language in communication with the child is the language of play. Since children express their feelings and thoughts more easily in games, games can be used as an educational tool for them. Children spend most of their energy and time playing. The need for play is a need like food, love and shelter. For some adults, play is nothing more than carefree and fun. It is the opposite of work, which is a serious aspect of life (Özbey, 2004). It provides his mental, physical, emotional and social development. In addition, it is suggested that there is a relationship between the level of development of game behaviors and intelligence. Since intelligence is equivalent to adapting to the environment, game activities are so important (Shaffer et al., 2005). Every child plays and loves to play. Through play, children have the opportunity to spend their accumulated energies in a socially acceptable way, and they become better able to express themselves. In this respect, the game is an entertainment process where the child can throw off his energy and get rid of negativity in his thoughts and actions. Play is a natural state of the child (Büyüköztürk, 2013). While playing, the child can explain himself, feel comfortable and enjoy life. Most importantly, the game is the undeniable fact of the child's educational developmental process (Çakır and Akbaş, 2013).

With the game, the child will be more comfortable in knowing himself and revealing himself. The cooperation of many sense organs in the child's perception and learning process of the world will cause him to grasp the outside world more quickly and increase his adaptation to the outside world (Bayırtepe and Tüzün, 2007). The game is not only for individuals to be

happy and to create a fun environment, but also an environment where everyone can interact. This environment allows students to develop not only personality, but also social skills, cooperation, friendship, self-confidence and responsibility. Play contributes to many different developmental characteristics (physical, social, mental, psychological and emotional). Many information, concepts or rules that are taught by force to the child can be overcome more easily during the game (Aral et al., 2001). Children unconsciously learn, adopt and practice many definitions and concepts such as learning, decision making, cooperation, problem solving, sequencing, organizing, sharing, respecting the rights of others, social communication, and helping each other (Akbarak and Turaşlı, 2017).

The game, which is discussed in game-based learning, is a sportive action between two teams or individuals based on certain rules. According to Piaget, play is harmony. The game is the most beautiful and fun way to apply movement and skills together. Games can be divided into movement and sports. Chess, ball games, dance can be given as examples of movement games. Thinking games and depiction games can be given as examples of sportive games (Çakır and Akbaş, 2013). Games are a fun activity not only for children but for individuals of all levels. If the concept that should be taught to children or students is adapted to their games, students can learn this concept with fun (Landreth et al., 2006). Games are a tool for children to correct their mistakes and deficiencies (Gözalan and Koçak, 2014). For example, children will try to play a game so as not to make mistakes. This will help children focus their attention for a long time. In addition, students will enable them to adopt the soft information they have acquired in a concrete way. In addition, games are a fun activity that can increase a student's interest and motivation towards the lesson. (Şaşmaz and Erduran, 2004). Children interact with other children through games. As a result of this interaction, children engage in social activities such as speaking well, expressing their thoughts in a healthier way, empathy, helping each other, and sharing. Considering all these, games can be used as a learning tool, and children can be internalized in a healthier way. It is created with certain problem scenarios in game-based learning environments (Mutlu and Aydoğdu, 2003).

In game-based learning environments, students create their own problems and do research on these problems, communicate with their peers and eventually solve the related problem. One of the greatest skills that students acquire in game-based learning environments is to critically evaluate the problems they frequently encounter in daily life. In this respect, gamification acts as a bridge between learning environments and learning (Avcı et al., 2009).

Landreth et al., (2006) state that educational games have some contributions to students. They highlight as important acquisitions such as decision making, planning, communication and strategic thinking. On the other hand, Walsh et al., (2017) argue that game-based learning environments create new social and cultural worlds and this helps learning through combining thinking, social communication and technology. Some of the features of game-based learning are: It is motivating and interesting. It allows learners to focus longer. In game-based learning, the student is always active. They are directly involved in the experience and benefit from it (Avcı et al., 2009).

Giving feedback is very important in game-based learning. Thus, students do not waste time due to their mistakes and take action to correct their mistakes immediately. Game based learning keeps students motivated, engaging, and fun, allowing students to stay focused longer (Bayırtepe and Tüzün, 2007). With game-based learning, it helps students remember complex events and concepts more easily and facilitates their learning. Garris et al., (2002), computer games are an excellent learning tool. Some of the tools we can use to design a game-based learning environment are as follows (Garris et al., 2002):

- ✓ Armored Penguin: Various puzzle games can be prepared with this application.
- ✓ Big Hug Labs: It contains many features such as making posters, editing photos, making puzzles.
- ✓ Classcraft: It is a platform where in-class discussions can be conducted and students can be rewarded and punished.
- ✓ Jigsaw Planet: It is a platform where we can turn pictures into puzzles.
- ✓ LearningApps: It is a 2.0 Web application that we can develop interactive items and use them easily in education and training processes (Garris et al., 2002).

Many studies in the field of playgrounds have revealed that teaching the lesson with games attracts the attention of the students, they get the information more quickly, and they are more willing to the lesson. It is accepted that the game is a learning environment. When the students are in the game, they are more interested in the subject and provide a permanent learning by focusing their attention on the subject better (Bottino et al., 2006). It is thought that what you learn in this way will stay in the memory longer. Critical thinking and decision making skills are developed, and it is stated that there is a positive development in behaviors. Children learn unconsciously in the play environment, communicate with other children, develop the concept of cooperation, use their creativity and have a structure that develops over time (Garris

et al., 2002). Children think and gain experience through play. They grasp the limits of their abilities and the properties of the objects around them through trial and error. At school age, especially in the first years of primary education, many psychomotor skills are learned through play. Play at school is a very useful tool for the child's mental, psychomotor, spiritual, emotional and social development (Mann et al., 2002).

In general, the game has four missions. Since students cannot throw their energies in the classroom and they need to be active in the classroom, they relax by throwing their energy away thanks to the games (Garris et al., 2002). The fact that students are usually running, jumping, jostling and always moving is due to the need to discharge this energy. Students acquire different knowledge and skills through the game. It is easier and more fun to learn a knowledge and skill with such games and activities rather than learning it in the classroom. In addition, by involving each student in the process in a comfortable learning environment, it is ensured that they make sense of the information. Some games are games that students can understand and empathize with. In these games, students take on some roles (Tüzün et al., 2008).

In the games, it is seen that the students try to be like them or act like them by putting themselves in someone else's shoes. Thus, in the psychodrama activities held in the classroom, students have the opportunity to play various roles and prepare themselves for their future lives. Some games, on the other hand, are therapeutic games that are performed in order for students to overcome this emotional tension when they are nervous or afraid (Yeşilyaprak, 2003). Thanks to these games, students act as a tool that helps them get rid of these tensions by minimizing their fear and uneasiness. It is especially recommended that the game be used as a method or activity while the objectives and indicators are discussed in the program. Learning through play is seen as an integral part of this program and pre-school education (Avcı et al., 2009).

Similarly, studies show that learning, skills and performances increase significantly in the learning process of the game. In the preschool period, the form of the children's lesson is play. There are different studies offered to children through different activities they do at school (Avcı et al., 2009). Learning takes place through play activities (Garris et al., 2002). As Çakmak (2000) mentioned, thanks to the game, students will improve themselves by focusing more on the subject, to develop their skills, to approach the lesson more carefully and more interested, to offer solutions to questions and problems. In this way, the student becomes an individual who is able to concentrate comfortably and willing to learn. Students in the game age internalize

information more easily with games. In addition to these, the selection of important tools and the place where the game will be played is very important (Dönmez-Usta and Turan-Güntepe, 2016).

If they feel comfortable with games, they can express themselves more easily. In addition, understandable expressions should be used in the rules of the game, and the students should be informed by the teacher, with careful attention to detail. The games designed and edited should be suitable for the subject areas (Kirriemuir and McFarlane, 2004). Thus, the lessons become more instructive, reinforcing, interesting and entertaining. Based on the studies on games, the game has a key role in every aspect of the child's life. Play enables the development of the child. It is clear that it will be effective to use this concept, which is so important for the child, in education and training by playing games or developing games. According to Ersoy (1999), play is an important tool that teaches the child life twenty-eight. Children have fun and learn while playing. It is a fact that has been accepted for years by educators that children learn by having fun and willingly.

Avedan (1971) emphasizes that it is difficult for children to keep their attention for a long time during education and training. Children's attention spans range from fifteen to twenty minutes on average. Children get bored very quickly and get distracted. Children may become reluctant to learn, as their attention will be distracted quickly. This negatively affects learning. The attention span of children, especially in primary and secondary education, is quite short. Games provide more attention than other learning techniques, as they enable students to participate actively in the learning process.

Swindells and Stagnitti (2006), games have an important place in the education of the child. Recognizing this, educators have taken into account children's interest in the game. Instead of explaining the subjects theoretically, they have developed methods that embody and dramatize them. The information taught in this way is more understandable and permanent. In addition, children are interested in the lesson and learning. Play is one of the techniques used for effective teaching. The student both has fun and learns through play, and most of the time the student is not even aware that he is learning while playing (Ülküdür and Bacanak, 2013). Princeky (2001) argues that the development of children's abilities, the increase in their understanding and perception power, as well as the ability to express their emotions is the basis of play, and emphasizes that the lessons will be more productive and the education and training



process will be more comfortable for the student, if the educational activities are carried out in the form of games.

Shaffer et al., (2005) argue that play is the main factor in raising children in a healthy and strong manner, developing their personalities, perception and comprehension skills, preparing them for real life, gaining desired behaviors, and therefore everything should be taught through play. He lists the benefits of teaching as follows. The game attracts the attention of the child and increases his interest in the lessons. Play is a good motivation tool that increases the child's motivation to the lesson. Since the child will be actively in the process of playing, he feels happy and belongs to the place where he is. The game saves the lessons from boringness, adds excitement to the lessons and makes the lesson interesting. The most important feature of the game is that students can be directed to unlimited creative and exploratory learning with the game (Avcı et al., 2009). A lesson that students do not like can become very enjoyable with a game.

In the game, children are much more free as they learn new information well through their own assessment and in their own way. Learning in the game is fun and carefree. Students learn and enjoy every minute of the game as the game draws students' attention. At first glance, children's games may seem simple, but play is directly related to every aspect of development and learning (Garris et al., 2002). It is possible to list the effects of play on education and training as follows: Play provides opportunities for children to develop new cognitive, social, emotional and physical skills. In addition to learning these skills well, they can also use them in various situations and transfer their learning to real life. Play allows children to think and use real experiences. Through play, the child can see how new experiences relate to previous learning. Can learn from their own learning (Kirriemuir and McFarlane, 2004).

Much of what the child knows was not taught to him, but was settled by his own experience. When children play, they can develop a playful attitude that can think of many ideas, new ways to do things and solve problems, and can think very creatively in problem solving, adding innovations to their learning. The value of art develops through play (Yeşilyaprak, 2003). When the child makes pottery from clay, he becomes a potter, playing with words, develops his sense of rhythm and sound in prose and poetry (Mann et al., 2002). Play allows the child to learn to learn, to be motivated to learn in the form of curiosity, invention, fulfillment and many more. The child's attention span is as much as the entertainment time that interests them. For example, when the child is doing an experiment, he waits for the

result with curiosity and does not let it go until the result, or when he sees his shadow for the first time, he starts to create shadows in different ways with excitement and curiosity (Avcı et al., 2009).

When the child learns through play, he becomes interested in learning. When a child learns through play, he learns to love learning. Thanks to the game, the child uses his excess energy in a good way and easily learns and applies many rules that he has difficulty in learning (Bakar et al., 2008). The child learns to be free and self-directed in the game. Often, play increases the tension that comes with having to achieve or needing to learn. In the game, the child relaxes, challenges, but is not punished for his mistakes. Topics with the help of game technique; it becomes more motivating, more meaningful, more interesting, gains quality more easily, correcting the wrong study habits, prolonging the retention rate and duration (Bayırtepe and Tüzün, 2007). With the implementation of this, it is ensured that skills are developed, knowledge is structured in the mind and the bonds between concepts are strengthened. When the child adds academic skills and content to his games, the good feelings he feels during the game are also reflected in the academic field. Imagination in play makes academic activities meaningful and important. While playing, the child's attention is focused on the activity itself rather than on the goals or results of the activity (Koçyiğit et al., 2007). This feature of the game provides a low-risk environment when children are asked to try something or do something new and difficult (Demirel et al., 2003).

Play-based learning activities offer children the opportunity to learn different skills and ideas. In addition, the game provides many ways for children to acquire these skills. Engaged in play, the child can allow his own actions to form with his own little habits and patterns of behavior (Dönmez-Usta and Turan-Güntepe, 2016). Because these are his own habits. He can reveal them at any moment and move in entirely new directions at will. The game provides a stimulating environment for mental and emotional creativity (Çankaya and Karamete, 2008). Potentially every child's play is the perfect expression of himself as a developing individual. Play helps the child get to know himself, others, and things around him better. Basically, it gives the child the opportunity to learn to learn. In short, depending on the quality of the game, the child's mind, physical ability and personality develop. The game is a very powerful motivation tool in the learning process. It helps students get used to the classroom environment. Through play, the child learns to create, reconstruct, destroy, and explore materials (Tüzün et al., 2008).

Play experiences allow the child to mingle with other children, discover what their friends are doing, and observe their friends' behavior and reactions. When the game is set up for learning, it allows students to test their skills in many ways without fear of failure (Kirriemuir and McFarlane, 2004). This, in turn, improves their self-esteem and self-esteem. The child goes beyond the stereotypical rules in the game and brings different solutions to the events. Since play develops motivation, the child actively participates in the learning environment and learns by having fun and pleasure. Teaching becomes more enjoyable as the game attracts children's attention. Teaching supported with games is both more fun and more effective and permanent. Games create an important link between the knowledge acquired in the learning process and the application of this knowledge. This connection becomes very important in concretizing and exemplifying soft information and concepts (Avcı et al., 2009).

The game realizes better quality and more effective learning by making abstract concepts that are difficult to understand and make sense of the students understandable (Walsh et al., 2017). The child can send the information that passes from the abstract to the concrete to the right address in his mind and can make sense of the information. Another important aspect of educational games is students' understanding of information correctly. Educational games also allow the reinforcement of the learned knowledge and the repetition of it in a fun way. In this way, it can be ensured that students who are shy or bored with the lesson actively participate in the lesson. However, the feature sought in games is not only fun. In addition, it is important to prepare and plan the games in advance in order to be oriented towards the purpose and course objectives of the course and to establish a relationship between learning and learning (Landreth et al., 2006). Every game that helps teaching activities and is planned in accordance with the objectives of the lesson is an educational game. Educational games are activities that aim at the physical, mental, emotional and social development of students, are seen as an integral and complementary part of education, make education fun and are carried out in a planned manner (Koçyiğit et al., 2007).

## **METHOD**

Ethics committee decision was not taken as this research is a compilation. In addition, necessary ethical rules were complied with during the writing process of the article.

### **Problem statement and sub-problems**

What are the effects of game-based learning environments on Preschool Students' Learning Preferences? and what is the effect of game-based learning environments on the achievement of Preschool Students?

- ✓ *What is the effect of the teaching method used on learning preferences?*
- ✓ *What is the effect of gender and teaching method interaction on learning preferences?*
- ✓ *Is there a significant difference between the pretest-posttest scores of the experimental group regarding their preferred learning paths?*
- ✓ *Is there a significant difference between the pretest-posttest scores of the control group regarding their preferred learning paths?*
- ✓ *Is there a significant difference between the experimental and control group's post-test, preferred learning path scores?*

### **Model of the research**

In the research, dominant-less dominant mixed method design was used. The dominant less dominant mixed method design was defined by using one of the qualitative or quantitative research methods and using the other research design in a small dimension of the research (Tashakkori et al.,1998).

### **Working group**

Criterion sampling method, one of the purposive sampling methods, was used in the research. The criterion was sought for the children included in the scope of the research to be children aged 4-6 who attend kindergarten and this school. The experimental group in the study group was determined as the group in which the researcher conducted the education process, and a different kindergarten was determined as the control group.

In the study, game-based learning, game-based learning-teaching practices were applied to the experimental group children and activities in line with the current education program were applied to the control group. While the activities were carried out in the experimental group, the names of the children's favorite out-of-class and indoor games were created as a list, in addition to the activities included in the education program.

The children then freely chose the game they wanted from the activities determined individually and as a group from this list and played them. Children are given the right to choose more than one game on the list. In addition, some techniques and tools were supported while playing the games. In game-based learning activities, games based on real-life scenarios, in

which children will use their imagination, were played. The activities were completed in eight weeks.

### **Data collection tools of the research**

A semi-structured interview and observation form was used as a data collection tool in the research. In the interview form used in the research, children's perceptions of the concept of game and the games they prefer with the game-based learning model were asked. For the questions in the interview form, firstly, the opinions of three preschool teachers, two experts in the field of education programs and teaching, an expert in the field of measurement and evaluation, and a Turkish teacher were consulted. Each child was given 10 minutes for the questions in the interview form prepared for the experimental group children. Interviews were held in the classroom and the children voluntarily participated in the interviews.

In the semi-structured observation form, it was tried to determine the learning paths preferred by the children with the game-based learning-teaching model. While developing the observation form, first of all, a literature review was conducted on the game-based learning model and the learning paths preferred by children. After the literature review, the items in the observation form were written and a four-way rating was used for these items as never, rarely, often, always. In addition, quotations were made from the activities determined by the various game-based learning model in the research through document analysis.

### **Analysis of data**

Semi-structured interview form and observation form were applied to the study group of the research. While the observation form and interview form were applied to the experimental group; the observation form was applied to the control group. A video recording tool was used to observe the practices of the children in the classroom and the researchers checked whether the skills in the observation form were performed by the children. Afterwards, these videos were shown to three preschool teachers working in different schools, and the teachers' opinions were asked about whether the skills in the observation form were done by the children. In the analysis of the data, the Shapiro-Wilks value was checked for the normal distribution of the items in the observation form prepared for learning preferences.

According to Büyüköztürk (2014), when examining the normal distribution, Shapiro-Wilks tests are used if the number of groups is less than 50, and Kolmogorov-Smirnov tests are used if the number is greater than 50 (Büyüköztürk, 2013). According to the normality tests, it was observed that the items in the observation form did not show a normal distribution. The

Mann Whitney U-Test was used to compare the scores of the children in the experimental and control groups, and the Wilcoxon Signed Rank Test was used to compare the pre-test and post-test scores of the groups in the observation form prepared about learning preferences.

In the semi-structured interview form, descriptive and content analysis methods were used for the data obtained. While determining the codes, the literature was scanned and it was examined whether there were previously developed categories related to the subject. After the codes suitable for the research were determined, the answers of the children were classified and the source and coding densities were determined. Then, comments were made by making direct quotations about the views of the children. Various codes were used for children while transferring directly. In addition, for the reliability of qualitative data, the data obtained were digitized, frequency and percentage were calculated, and the data were tested according to the 0.05 significance level.

## RESULTS AND COMMENT

The findings regarding what the concept of play means according to preschool children are given in Table 1.

**Table 1. Descriptive analysis results of children's opinions on the games they prefer in the game-based learning model**

	Category	Source		Coding Density	
		Frequency	Percent (%)	Frequency	Percent (%)
What games do children prefer in game-based learning?	Fun Games	15	37.5	18	45.0
	Cooperative Games	12	30.0	12	30.0
	Individual Games	13	32.5	10	25.0
<b>Total</b>		40	100.0	40	100.0

As seen in Table 1, in the descriptive analysis results of the interviews with 40 children, the games preferred by the children in game-based learning were categorized as fun, cooperative and individual. In the category of fun games, I like, make me laugh, look forward to, and want to play at home; in the category of cooperative games, it can be said that they prefer the games that I play with my friend and my teacher, and that I do not share my toys with anyone in individual games and that I do not play with a group. From this point of view, it is seen that children prefer games that they like, that are played with their friends and that they do not share their toys with anyone.

- ✓ *“There is a game, I liked it very much, I chose it....I remembered the game with glasses”*
- ✓ *“My favorite thing is games played by everyone”*

- ✓ “I don't want to play games that I don't like. i love car racing game”
- ✓ “I love the dough cake game, I really, really like it”
- ✓ “I don't like to play alone”
- ✓ “I play more when I have someone by my side”
- ✓ “I don't give my toy to anyone else. I want to play alone”
- ✓ “Why should I play with someone else it's better to play alone”
- ✓ “I like to play as a group”
- ✓ “I don't like to play with anyone”

The findings of the scores regarding the learning paths preferred by the experimental group in the pretest-posttest are given in Table 2.

**Table 2. Pre-test-post-test, preferred learning paths test results of the experimental group**

Post-Test - Pre-Test	Number of Persons	Rank Average	Rank Sum	z	p
Positive Ranks	26	17.00	24.42	<b>-6.042</b>	<b>0.031*</b>
Negative Rows	10	1.54	2.36		
İndifferent	4	6.00	8.00		
Total	40				

\* $p < 0.05$

As seen in Table 2, it is seen that there is a significant difference in favor of the posttest between the scores of the children regarding the learning paths they prefer in the pretest and posttest ( $z = -6.042$ ,  $p \leq 0.05$ ). From this point of view, it can be said that the experimental group children in which the game-based learning and teaching model is applied contribute to the learning paths they prefer. The findings of the scores regarding the learning paths preferred by the control group in the pretest-posttest are given in Table 3.

**Table 3. Test results of the control group on pre-test-post-test, preferred learning paths**

Post-Test - Pre-Test	Number of Persons	Rank Average	Rank Sum	z	P
Positive Ranks	32	29.00	31.85	<b>-5.854</b>	<b>0.031*</b>
Negative Rows	6	2.11	3.60		
İndifferent	2	4.09	6.49		
Total	40				

\* $p < 0.05$

As can be seen in Table 3, no significant difference was observed between the scores of the children regarding the learning paths they preferred in the pretest-posttest ( $z = -5.854$ ,  $p > 0.05$ ). From this point of view, it can be said that the activities carried out in line with the current education program do not contribute to the learning paths preferred by the children. The

findings of the post-test preferred learning paths of the experimental and control groups are given in Table 4.

**Table 4. The mann whitney u-test results of the experimental and control groups on post-test, preferred learning paths**

<i>Groups</i>	<i>Number of Persons</i>	<i>Rank Average</i>	<i>Rank Sum</i>	<i>U</i>	<i>p</i>
Experimental group	25	32.174	698.69	412,00	<b>0.001*</b>
Control Group	15	11.96	352.08		
Total	40				

**\* $p < 0.05$**

As can be seen in Table 4, it is seen that there is a significant difference between the scores of the children regarding the learning paths they preferred in the posttest ( $U=412.00$   $p \leq 0.05$ ). When the mean rank is examined, it is seen that the scores regarding the learning paths preferred by the children in the experimental group are higher than the children in the control group. From this point of view, it can be said that the game-based learning model contributes to the learning paths preferred by the children in the experimental group.

## CONCLUSION AND EVALUATION

With the applications made in the game-based learning model, it was seen that the children defined the game as reflecting the inner world of the individual, obeying the rules set by others or himself, showing his power like superheroes and meeting different events. Especially preschool children communicate through games, attach meanings to the events and objects around them like a scientist, and internalize certain positive or negative behaviors in an autonomous period. Then, by putting forward his own rules, he expects the people around him to follow these rules.

In the world we live in, there are games wherever there are children, and children learn about the world through games. For some children, play is a bridge between reality and imagination. For some, the game is a form of self-expression of the individual. As a matter of fact, in the study, it was seen that children explained the game by associating the game with superheroes with the game-based learning model. Children who model their superheroes by using their imaginations also learn good, right and wrong by reflecting their inner world to the outside. Landreth et al., (2006) see games as a reflection of the scenarios in the imagination of preschool children to the real world and state that these scenarios will be associated with real-world events by children over time.



Here, the game-based learning model emphasizes that there are certain rules for everyone and that everyone should follow these rules during the game, taking into account the self-centeredness of children. Thus, with game-based learning activities, children can act independently and freely to cooperate with their friends, help each other, etc. learns the rules and tries to reflect this in his life. Children are confronted with real-life problems/scenarios in the activities and applications made with the game-based learning model. With these scenarios, children explore their environment. In the study, it was observed that children defined the game as an explanation of the objects and events encountered with a sense of curiosity. As can be understood from these definitions, play is a source of motivation for children. The child with increased motivation will want to know more about the game and will be open to learning new knowledge and skills. In short, the game-based learning model is seen as an important process in the structuring of thinking in children, as it enables children to think about real-world events. Then these processes are critical thinking, creative thinking, problem solving, etc.

There was no significant difference between the pretest-posttest scores of the control group regarding their preferred learning paths. In other words, it was concluded that with the activities and practices carried out in line with the current education program, they listened more and followed the rules to be followed with the activities, they had problems in expressing themselves, they had one-way communication and they could not use their body movements. However, preschool children are very active physically. They always want to play and explore the world. This sense of discovery and curiosity should be supported by schools and educational programs. Games are tools that reflect the inner world of children. Children express themselves freely and clearly through play. There was a difference in favor of the experimental group between the scores of the experimental and control groups regarding the learning paths they preferred in the posttest. With the game-based learning model applications applied in the experimental group, it was concluded that the children preferred learning ways suitable for them. It was observed that some of the experimental group children listened carefully to their friends and teachers with game-based learning applications and asked the subjects they did not understand or were curious about. Some children played games using gestures, while some children preferred only individual games.

Children feel real world events with games. They find solutions to these events they encounter with games. When they encounter similar events in their later life, they use the experiences they have gained here. Not only are they limited to these skills, the game also contributes to children's language skills. In fact, this purpose is emphasized in the game-based

learning model. In other words, one of the reasons for giving scenarios to children with the game-based learning-teaching model is to develop children's language skills such as speaking, listening, reading and writing. Each child uses his language skills according to his preferred learning path. Now, according to this learning path, the child defines the game according to himself.

It has been observed that children prefer fun, cooperative and individual games in game-based learning model applications. Based on individual differences, each child chooses the most suitable game for them. The child, who determines his own game by considering his learning preference, sometimes internalizes the spirit of the character in the game with a sense of empathy and behaves like him. Such a mood allows the child to enjoy the game, and the game becomes fun.

## REFERENCES

- Akbayrak, N. and Turaşlı, N. (2017). Investigation of the effect of game-based environmental activities on environmental awareness of preschool children. *Journal of Early Childhood Studies*, 1(2), 239-258. <https://doi.org/10.24130/eccd-jecs.196720171240>
- Aksoy, N.C. (2014). *The effect of digital game-based mathematics teaching on 6th grade secondary school students' achievement, achievement motivation, self-efficacy and attitude characteristics*. (Unplashed doctoral thesis). Gazi University Institute of Educational Sciences, Ankara.
- Aral, N., Gürsoy, F. & Köksal A. (2001). *Game in preschool education*. YA-PA Publications, Istanbul.
- Avcı, Ü., Sert, G., Özdiñç, F. & Tüzün, H. (2009). *The effects of educational computer games in information technologies course*. Ninth International Educational Technologies Conference, 6-8 May, Ankara.
- Bayırtepe, E. and Tüzün, H. (2007). The effects of game based learning environments on students achievement and self-efficacy in a computer course. *Hacettepe University Faculty of Education Journal*, 33(2), 41-54.
- Bakar, A., Tüzün, H. & Çağıltay, K. (2008). Students' views on the use of educational computer games: Example of social studies lesson. *Hacettepe University Faculty of Education Journal*, 35(1), 27-37.
- Boyras, B. and Dolunay, A. (2014). Pre-modeling and 3D printer applications in sculpture art. *Ulakbilge Journal of Social Sciences*, 2(3), 70-80. <https://doi.org/10.7816/ulakbilge-02-03-05>
- Büyüköztürk, Ş. (2013). *Handbook of data analysis for the social sciences (18th ed.)*. Ankara: PegemA Publishing.
- Bottino, R. M., Ferlino, L., Ott, M. & Tavella, M. (2007). Developing strategic and reasoning abilities with computer games at primary school level. *Computers & Education*, 49(4), 1272-1286. <https://doi.org/10.1016/j.compedu.2006.02.003>
- Cheung, R.H.P. (2018). Play-based creativity-fostering practices: the effects of different pedagogical approaches on the development of children's creative thinking behaviours in a Chinese preschool classroom. *Pedagogy, Culture and Society*, 26(4), 511-527. <https://doi.org/10.1080/14681366.2018.1424725>
- Çakır, R. and Akbaş, O. (2013). Examination of high school students' learning styles according to some variables. *Mehmet Akif Ersoy University Journal of the Faculty of Education*, 25(2).

- Çakmak, M. (2000). Mathematics teaching and active learning techniques in primary education. *Journal of Gazi University Faculty of Education*, 20(3).
- Çankaya, S. and Karamete, A. (2008). The effect of educational computer games on students' attitudes towards mathematics lesson and educational computer games. *Journal of Mersin University Faculty of Education*, 4(2).
- Çelebi-Öncü, E. and Özbay, E. (2005). *Game for preschool children*. Root Publishing, Ankara.
- Demirel, Ö., Seferoğlu, S. S. & Yağcı, E. (2003). *Instructional technologies and material development*. Ankara: Pegem A Publications..
- Dönmez-Usta, N. and Turan-Güntep, E. (2016). *Learning with game design: Developmental stages example*. 7th World Conference on Learning, Teaching and Educational Leadership, Hungary.
- Garris, R., Ahlers, R. & Driskell, J. G. (2002). Motivation and Learning: A research and practise model. *Simulation and Gaming*, 33(1).
- Gözalan, E. and Koçak, N. (2014). Investigation of the effect of the game-based attention training program on the vocabulary knowledge levels of five-six-year-old children. *Karamanoğlu Mehmetbey University, Journal of Social and Economic Research*, 16(1).
- Kirriemuir, J. and McFarlane, A. (2004). *Literature review in games and learning (Futurelab Series, Report 8)*. Bristol, UK: Futurelab.
- Koçyiğit, S., Tuğluk, M. N. & Kök, M (2007). Play as an educational activity in the development process of the child. *Journal of Kazım Karabekir Education Faculty*, 16(2).
- Landreth, G., Homeyer, L. & Morrison, M. (2006). *Play as the language of children's feelings. Play from birth to twelve. Contexts, perspectives and meanings*. (Edt: D. P. Fromberg and D. Bergen). New York, NY: Routledge.
- Lim, C.P., Nonis D. & Hedberg J. 2006. Gaming in a 3d multiuser virtual environment: Engaging students in science lessons. *British Journal of Educational Technology*, 37(2).
- Mann, B.D., Eidelson, B.M., Fukuchi, S.G., Nissman, S.A., Robertson, S. & Jardines, L. (2002). The development of an interactive game-based tool for learning surgical management algorithms via computer. *The American Journal of Surgery*, 108(2).
- Melendez, W.R., Beck, V. & Fletcher, M. (2000). *Teaching social studies in early education*. USA: Delmar Thomson Learning.
- Mutlu, M. and Aydoğdu, M. (2003). Kolb's experiential learning approach in science education. *Pamukkale University Faculty of Education Journal*, 1(13).
- Özyürek, A. and Çavuş, Z.S (2016). Examining the use of the game as a teaching method by primary school teachers, *Kastamonu Education Journal*, 24(5).
- Özbey, Ç. (2004). *Constructive solutions to children's problems*. Istanbul: İnkılâp Publications.
- Pilten, P. and Pilten, G. (2003). Evaluation of school-age children's perceptions of the concept of play and their game preferences. *Mersin University, Journal of the Faculty of Education*, 9(2).
- Roskos, K.A. and Christie, J. F. (2007). *Play and literacy in early childhood: research from multiple perspectives*. (Eds. Roskos ve Christie). Routledge, Taylor and Francis Group, New York and London.

- Saban, A. (2000). The learning-teaching process. Ankara: Nobel Publishing.
- Sezer, H. and Şahin, H. (2016). The use of 3D printing material in education qua valley. *World of Medical Education*, 15(46).
- Swindells, D. and Stagnitti, K. (2006). Pretend play and parents view of social competence: The construct validity of the child-initiated pretend play. *Australian Occupational Therapy Journal*, 53(1).
- Shaffer, D.W., Squire, K.R., Halverson, R. & Gee, J. P.(2005). Video games and the future of learning. *Phi Delta Kappan*, 87(2).
- Şaşmaz, Ö. F. and Erduran, D. (2004). The effect of teaching with educational games on academic success in science lesson, sun and system and planets, *Ondokuz Mayıs University Faculty of Education Journal*, 18(3).
- Tashakkori, A., Teddlie, C. & Teddlie, C. B. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46). sage.
- Turgut, H. and Yılmaz, S. (2010). Creation of ecologically based children's playgrounds. Third National Black Sea Forestry Congress, 4(2).
- Tüzün, H., Arkun, S., Bayırtepe, Yağız, E., Kurt, F. & Yermeydan-Uğur, B. (2008). Evaluation of computer games for learning about mathematical functions. *İmanager's Journal of Educational Technology*, 5(2).
- Ülküdür, M. A. and Bacanak, A. (2013). Comparison of project-based learning activities and game-based learning activities in the preparatory dimension. *Journal of Bayburt Education Faculty*, 8(1).
- Walsh, G., McGuinness, C. & Sproule, L. (2017). *It's teaching but not as we know it: using participatory learning theories to resolve the dilemma of teaching in play-based practice*. Early Child Development and Care ISSN: 0300-4430.
- Wood, E. and Atfield, J. (2003) *Play, learning and the early childhood curriculum*. London: Chapman.
- Yeşilyaprak, B.(2003). *Guidance services in education-developmental approach. (Seventh Edition)*. Ankara: Nobel Press.
- Yiğit, A. (2007). *The effect of computer aided educational mathematics games on achievement and permanence at the second grade primary education level*. Çukurova University Institute of Social Sciences, Adana.

<b>KATKI ORANI / CONTRIBUTION RATE</b>	<b>AÇIKLAMA / EXPLANATION</b>	<b>KATKIDA BULUNANLAR / CONTRIBUTORS</b>
Fikir ve Kavramsal Örgü / <i>Idea or Notion</i>	Araştırma hipotezini veya fikrini oluşturmak / <i>Form the research hypothesis or idea</i>	Alper EYİNÇ, Ali Osman ENGİN
Tasarım / <i>Design</i>	Yöntem ve araştırma desenini tasarlamak / <i>To design the method and research design.</i>	Alper EYİNÇ, Ali Osman ENGİN
Literatür Tarama / <i>Literature Review</i>	Çalışma için gerekli literatürü taramak / <i>Review the literature required for the study</i>	Alper EYİNÇ, Ali Osman ENGİN
Veri Toplama ve İşleme <i>Data Collecting and Processing</i>	Verileri toplamak, düzenlemek ve raporlaştırmak / <i>Collecting, organizing and reporting data</i>	Alper EYİNÇ, Ali Osman ENGİN
Tartışma ve Yorum / <i>Discussion and Commentary</i>	Elde edilen bulguların değerlendirilmesi / <i>Evaluation of the obtained finding</i>	Alper EYİNÇ, Ali Osman ENGİN

#### **Destek ve Teşekkür Beyanı**

Bu çalışmanın yazım sürecinde katkı veya destek alınmamıştır.

#### **Çatışma Beyanı**

Araştırmacıların araştırma ile ilgili diğer kişi ve kurumlarla herhangi bir kişisel ve finansal çıkar çatışması yoktur.

#### **Etik Kurul Beyanı**

Bu çalışmanın etik kurul beyanı yoktur.