

## Effect of Educational Games on Self-concept Levels of Inclusive Students Studying in Secondary Schools\*

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### Abstract

This research examines the effect of educational games on self-concept levels of inclusive students enrolled in secondary schools. The research was conducted in two secondary schools in Golbasi district of Ankara, the capital of Turkey, in the spring semester of 2015 - 2016 academic year. The research employed semi-experimental design with pretest and posttest control group. Of a total of 24 students, 12 (4 girls, 8 boys) were included in the experimental group and the other 12 (6 girls, 6 boys) were included in the control group. Educational games program, an independent variable of the research, was applied for 11 weeks, 2 lessons per week. The program that did not include educational games was applied to the control group. Self-concept Scale (SCS) was used to collect data in the research. Independent group t test was used for data analysis, and for single-factor repeated measures, two-factor ANOVA test was used. The significance level was determined to be 0.05. At the end of this research, a significant difference was found in favor of the students in the experimental group in terms of physical competence, physical appearance, peer relationships and general self-concept dimensions of the self-concept scale. On the other hand, there was not any significant difference in favor of both groups in terms of the dimension of relations with parents of the scale.

**Keywords:** educational games, self-concept, inclusive student

### 1. Introduction

Human being is an entity that needs to learn and teach to maintain his life. Especially in the early years of life, teaching with games serves to the child development in the easiest and in the most natural way. In this process, generally each game has a goal as well as a range of rules, enforcement, feedback and penalties (Ke, 2016; Klopfer et al., 2009, Wouters & Van Oostendorp, 2013, Prensky, 2001). The versatile structure of game, a universal way of learning, has contributed to the arrangement of educational environments and to the use of teaching with game as a professional education tool in recent years (Garris, Ahlers, & Driskell, 2002, Mayer, 2011, Aldrich, 2005; Vandercruysse et al., 2012, Koçyigit, Tuğluk & Kok, 2007).

According to Piaget (1962), a child learns through games to adapt to his/her environment. Games are actions that have solid rules in their own way. According to Montaigne (1570), playing games is the most real occupation of children because children take games quite seriously (Çamlıyer, 2009). Vygotsky (1967) describes games as a means that enable children to make sense and learn. Lazarus (1883) defined game as a free activity occurring spontaneously and bringing happiness. A game is an indispensable entertainment for children. Children learn to share, to act in solidarity, and to fight for an objective thanks to games (Pehlivan, 2005). One of the most functional explanations about games belongs to the famous Turkish philosopher, Mevlana. Mevlana said, "*Game is in fact in the mind, but a child gets wiser by playing them*" (Karakaya, 2008). As can be understood from this quote, games have a serious impact on the cognitive development of children. Through games, children learn to imitate reality in an objective way. Thus, the child experiences realistic experiences by doing daily work (such as changing clothes, washing dishes, hovering, impersonating social roles, etc.) or by acting important events in life (such as death and funerals) (Georges, 2007).

The action of teaching is thought to be an inherent talent in human beings (Csibra & Gergely, 2009; Goswami, 2004; Strauss, 2005; Strauss & Ziv, 2012; Tomasello, Kruger & Ratner, 1993) and a simple feature of our cognitive architecture (Rodriguez, 2013). However, it is necessary to use different methods and techniques in order for the

teaching activities, a professional occupation, to provide the desired learning (Bilen, 1996). It is unlikely that any teaching method will be valid for every course and for all students. The teacher should be able to use different teaching methods and techniques according to the students' types of learning, the feature of the subject to be taught, the facilities of the school, and the level of students. In this sense, teaching with games is one of the easiest, funniest and most effective tools for teachers (Demirel, 2002; Baykoc-Dönmez, 2000; Onay, 2006; Cangir, 2009) since educational games provide multiple benefits that enable the student to understand and evaluate him/herself, the environment and his/her friends (Tural, 2005; Onay, 2006). Furthermore, games are an essential part in the lives of especially elementary school students. Therefore, ensuring that students acquire desired behaviors through games, which are already natural ways for them to learn, will both increase the permanence of the child's learning and positively affect his/her attitude towards the lesson (Özden, 1999).

Today, progress in democracy and human rights has enabled disabled individuals to lead a fairer and more peaceful life in the society as well as positively affecting the society's perception of individual differences. In accordance with this purpose, schools also fulfill their duties by bringing together disadvantaged students and normal students through inclusive education (Kuz-Tayyar, 2001; Güzel-Özmen, 2003; Allen & Cowdery, 2005; Aral, 2011; Atkin, 2013; Ministry of National Education (MoNE), 2014, Gold & Richards, 2012; Vislie, 2003; Gillet et. al, 2012). By disadvantaged children, we refer to the children who have poor comprehension abilities, social adaptation problems or do not receive adequate support from his/her family (Perner, Frith, Leslie & Leekam, 1989; Baron-Cohen, Leslie & Frith, 1985). Thanks to the inclusive education in schools, individual education programs are prepared for each of these students and development of their affective, cognitive and psychomotor behaviors are supported (Allen & Cowdery, 2005; Batu-S & Kırcaali-Iftar 2005; Acarlar, 2013).

The main objective of educators is to ensure that each student develops as a whole in terms of all areas of development (Senemoglu, 2002; Sönmez, 2005). The perception of self-concept within the area of affective development has significant impact on development in this sense. Self-concept is about how an individual sees himself or herself rather than how others see them (Cüceloğlu, 1992; O'Mara, et al., 2006; Hofmann & Wilson, 2010; Wilson, 2002). Perceptions about self-concept emerge with the individual's interpretation of his/her own experiences and his/her own physical, academic and social environment.

Social comparisons play an important role in this process. For example, students take the performances of their friends as a reference to evaluate their own performances (Marsh, 1992). Self-concept exhibits a private and individual characteristic. Self-concept contributes not only to the individual's perception of him/herself as a separate being, but also to the struggle of that person as a being that wants and acts to get what he/she wants.

This research aims to determine the effect of educational games on the self-concept perceptions of the students enrolled in schools with inclusive education. When the related literature was examined, no research which was conducted on this subject was found. Instead, the literature review revealed that previous studies on games and educational games focused on the academic achievement of normal students (Ören & Avcı, 2004; Songur, 2006; Yıldırım, 2004; Altunay, 2004, Taşlı, 2003; Tural, 2005). Therefore, this study has made it possible for us to find out about the impact of educational games on the self-concept levels of inclusive students and to see the strength of games in the education world. We also expect that this study will inspire future studies that will boost inclusive students' learning and help them gain the habit of living together with other students. Last but not least, we believe that this study will evoke awareness for the education of inclusive students and inspire researchers to develop specially-tailored education programs for these children.

## **2. Method**

### *2.1 Research Design*

This research was conducted in accordance with the experimental design with pretest - posttest control group. In a study with the experimental design, individuals should be divided to experimental and control groups in an unbiased way. However, in education environments it is difficult to divide students to the groups in an unbiased way. Therefore, researchers preferred using quasi-experimental design, where available groups can be matched through certain variables and unbiased assignments can be made through these groups (Gay, Mills and Airasian, 2006).

### *2.2 Study Group*

The research was conducted with 12 (4 girls, 8 boys) inclusive students (experimental group) who receive education in a secondary school in the 2015-2016 academic year in Turkey and have mental competence at a level to respond to the scale applied according to the expert's opinion and 12 (6 girls, 6 boys) inclusive students (control group) who are in another secondary school in Turkey and have the same characteristics.

### 2.3 Data Collection Tools

#### 2.3.1 Self-Concept Scale

Personal information form developed by the researcher and non-academic part of the Self-Concept Scale developed by Marsh (1992) and adapted to Turkish by Fer and Sönmez (2008) were employed for data collection. The scale was developed by Marsh (1992) in order to measure the multidimensional self-concept perceptions of the elementary school students. Non-academic four sub-factors of the scale are composed of the items in relation to the students' physical competence, physical appearance, peer relationships, parent relationships and general self-concept perceptions.

Internal consistency reliability coefficient calculated for the entire scale is 0.95. Findings showed that the internal consistency reliability of factor items have an item-total correlation coefficient ranging from 0.17 to 0.65. Alpha coefficients of the subscales were between 0.75 and 0.94. The consistency level increases as the reliability coefficient approaches 1 whereas it decreases as the reliability coefficient approaches 0. In accordance with the specified references the internal consistency reliability coefficients of the scale were found at a good level (Fer and Sönmez, 2008)

#### 2.4 Research Process Procedure

The research process firstly began with the literature search on self-concept and educational games. Since the study group is a group that needs special education, in order to find out whether SCS is suitable for this group, confirmation was received from the researchers (Fer&Sönmez, 2008) who performed the validity and reliability study of the scale whether the assessment instrument is suitable to the group. In addition, positive opinion was received in regard to the scale items to be applied to the students from the School Counselor teacher who prepared the individual education program for students and from the teacher who taught Turkish to the students. Afterwards, parental permission for the research and ethical permission indicating voluntary participation of the students in this application were received. After receiving the consent of the related people, the experimental process was planned and the activity plan predicted to take 11 weeks was prepared. The prepared draft plan was reviewed by five specialists, two program development specialists, two specialist physical education teachers and an assessment and evaluation specialist, and the draft event plan was given the final form considering the expert opinions. Later, necessary correspondences were made with the related institutions and permissions were taken from the schools where the application would be made. Afterwards, we decided that one of the researchers of this research, who is also the physical education teacher in one of the schools where the research would be carried out, would conduct the study in the experimental group. On the other hand, in the other public school in the area where the research was conducted, the control group studies were carried out with the inclusive students with similar characteristics. The teacher working in the control group was informed about the points to pay attention during the research process and was given instructions to not carry out any educational games with the students during the semester. On a day specified by the school administration, the researcher taught a lesson through educational games to the experimental group for two hours (40+40 minutes) a week for 11 weeks. At the end of the experimental period, research findings were discussed according to pretest-posttest results given before and after the research.

#### 2.5 Data Analysis

In data analysis, firstly in order to test the difference between the self-concept scores of the experimental and control groups, independent group's t test was performed. Furthermore, since the number of subjects was limited in both groups (Experiment=12 persons, Control= 12 persons), Kolmogorov Smirnov test and homogeneity test were performed to see whether the groups were normally distributed. The first analyses showed that there was no significant difference between the groups ( $p > 0.05$ ) and the groups were normally and homogeneously distributed ( $p > 0.05$ ). For the comparison of pre- and post-test scores of the research data, two factor Anova model was used for repeated measures in the single factor (Büyüköztürk, 2004).

#### 4. Findings and Discussion

This section includes findings that show the effect of educational games on non-academic self-concept levels of inclusive students and discussions about these findings.

Table 1. Pretest Posttest Physical Competence Anova Results of the Experimental and Control Group Students

Source of Variance	Sum of Squares	sd	x	F	p
Intergroup	11.02	1	11.02	.20	.659
Error	1213.45	22	55.15		
Intragroup (Measurement)	72.52	1	72.52	13.89	.001*
<b>Group*Measurement</b>	<b>54.18</b>	<b>1</b>	<b>54.18</b>	<b>10.38</b>	<b>.004*</b>
Error	114.79	22	5.21		

\* $p < .05$

Table 1 demonstrates a significant difference in favor of the experimental group between the pretest-posttest measurements of the experimental and control group students. ( $F_{(1-22)} = 10.38$ ,  $p < 0.05$ ). While the pre-experiment physical competence perception average of the inclusive student in the experimental group was 28.75, it increased up to 33.33 after the experiment. Physical competence perception average of the inclusive students in the control group, however, increased from 31.83 up to 32.16. This result is an expected and desired one. In other words, we can say that the educational games variable used in the research helped the students perceive themselves more positively in terms of physical competence. The research findings are also supported with the findings of the research conducted by Özcan and Üstündağ (2017) with the students receiving normal education. The researchers used the non-academic self-concept scale developed by Marsh (1992) and adapted to Turkish by Yildiz and Fer, and found a significant difference in favor of the experimental group in the physical competence dimension of the scale. The literature review also revealed certain studies supporting these findings. According to Doğanay (2002), educational games develop individuals' physical and mental talents and artistic and aesthetic skills, make life enjoyable, and allow the information learned to be reinforced and repeated in a more comfortable environment. In physical games, the respiratory and circulatory systems of the children develop thanks to physical activities. Moreover, muscular and skeletal system development is supported. In both physical and educational games, the child is naturally prepared for the development of motor skills such as speed, strength and endurance. It helps strengthen the reflexes. Children learn and develop the limits of physical overloading and fatigue. The most positive effect on the development of balance and coordination of the children is games (Onay, 2007). Şirinkan (2011) searched the effect of sportive educational games on the physical developments of disabled students, and as a result of the research, significant differences were found in terms of the flexibility parameters of the students. This is another result that supports the results of this research.

Table 2. Pretest and Posttest Physical Appearance Anova Results of the Experimental and Control Group Students

Source of Variance	Sum of Squares	sd	x	F	p
Intergroup	.083	1	.08	.001	.97
Error	1492.91	22	67.86		
Intragroup (Measurement)	126.75	1	126.75	38.59	.00*
<b>Group*Measurement</b>	<b>108.00</b>	<b>1</b>	<b>108.00</b>	<b>32.88</b>	<b>.00*</b>
Error	72.25	22	3.28		

\* $p < .05$

Table 2 demonstrates a significant difference in favor of the experimental group between the pretest-posttest physical appearance scores of the experimental and control group students ( $F_{(1-22)} = 32.88$ ,  $p < 0.05$ ). While the pre-experiment physical appearance perception average of the inclusive students in the experimental group was 29.33, it increased up to 35.58 after the experiment. The average physical appearance perception of the inclusive students in the control group, however, increased from 32.41 up to 32.66. This result is an expected result. In other words, we can say that the educational games variable used in the research helped the students perceive themselves more positively in terms of physical appearance. A study conducted by Özcan and Üstündağ (2017) also supported these findings. Accordingly, the research conducted with normal students at the eighth grade revealed a significant difference in favor of the experimental group in the physical appearance dimension of the self-concept scale. Games allow the child to direct his aggression in a positive direction, helping to control excess energy. The feeling of enthusiasm, excitement and success that the child feels while playing helps to develop his/her self-confidence. Furthermore, through games, the child can get to know about his/her body, use it as he/she wants, and control him/herself (MoNE, 2014).

Table 3. Pretest-Posttest Peer Relationships Anova Results of the Experimental and Control Group Students

Source of Variance	Sum of Squares	sd	x	F	p
Intergroup	58.52	1	58.52	1.07	.31
Error	1201.45	22	54.61		
Intragroup (Measurement)	31.68	1	31.68	3.13	.09
<b>Group*Measurement</b>	<b>82.68</b>	<b>1</b>	<b>82.68</b>	<b>8.19</b>	<b>.009*</b>
Error	222.12	22	10.09		

\* $p < .05$

Table 3 demonstrates a significant difference in favor of the experimental group between pre-experiment and post-experiment peer relationships scores of the experimental and control group students ( $F_{(1-22)}=8,19$ ,  $p<0.05$ ). While the pre-experiment peer relationship perception average of the inclusive students in the experimental group was 30.08, it increased up to 34.33 after the experiment. Peer relationship perception average of the inclusive students in the control group, however, decreased from 30.50 to 29.50. This research result is an expected and desired one. In other words, we can say that the educational games variable used in the research helped the students perceive themselves more positively in terms of peer relationships. Likewise, Özcan and Üstündağ (2017) found that in the physical education lesson taught with educational games, peer relationship perceptions of the eighth grade students significantly changed in the experimental group.

Games support behaviors like respecting others, not telling lies, controlling oneself within a group, friendship and sharing. They help students make friends, feel themselves a part of their groups and support each other. In this way, children learn teamwork and understand the importance of working together to achieve a goal. Games provide the environment where both physical and mental abilities can be tried and repeated as much as desired to achieve self-confidence and mastery (Moyles, 1991). Games are a very important factor that ensures psychological development of children. Through games, children can express themselves more comfortably and establish relations with other children more easily. Playing with peers plays an important role in gaining the ability to establish social relations. Group games ensure the social and emotional development of children. Within a group, children learn about various social relations which help them to adapt to social environment. Children find the opportunity to express themselves within their environment especially through role playing in a group environment. Games, where, as previously mentioned, children find the opportunity to express themselves without the fear of making mistakes, also develop children's self-confidence (Sevinç, 2004).

Saban (2002) defines games as the activities that allow children to solve their emotional conflicts, develop various hypotheses about the world and test them, discover various social roles and status in the society and develop social skills that will help them establish good relationships with their peers.

According to Onay (2007), the play group starting with the family members is later replaced by peers with whom children establish mutual relationships. In this way, the concepts such as us, you and them begin to develop. Learning process starts with games. For this reason, games can be used as an educational tool especially at preschool and primary school levels. Games are an activity that gives comfort, fun, joy and pleasure. Studies conducted in this respect also seem to support these findings. A study by Kabasakal, Girli, Okun, Çelik and Vardarli (2008) examined inclusive students, peer relationships and peer abuse. Their study aimed to determine the position of inclusive students within peer relationships, the ways of their perception and the dimensions of peer abuse and to suggest solution-oriented implementations to educators. The sample group was composed of a total of 329 students from three elementary schools, 16 of whom were inclusive students. As the assessment tool, "Sociometry", "Who is this?" and "Peer Abuse Questionnaire for Students" were employed. The study found that inclusive students are not preferred by their friends for cooperative works in the classroom, and are perceived as problematic in terms of adaptation and communication. A comparison of the findings of their study with the findings of the current study will reveal that inclusive students, whose perceptions of peer relations are developed through educational games, will be more self-confident, which will in turn have a positive impact on normal students' perceptions of inclusive students.

Table 4. Pretest-Posttest Parent Relationships Anova Results of the Experimental and Control Group Students

Source of Variance	Sum of Squares	sd	x	F	p
Intergroup	33.33	1	33.33	.54	.46
Error	1339.33	22	60.87		
Intragroup (Measurement)	.33	1	.33	.034	.85
Group*Measurement	21.33	1	21.33	2.15	.15
Error	218.33	22	9.92		

\* $p < .05$

According to the anova result of the experimental and control group students, there was not any significant difference between the pretest and posttest measurements of the students' parent relationships ( $F_{(1-22)}=2,15$ ,  $p>0.05$ ). While the

pre-experiment parent relationship perception average of the inclusive students in the experimental group was 34.91, it increased up to 36.08 after the experiment. The average parent relationship perception of the inclusive students in the control group, however, decreased from 37.91 to 36.41. In other words, we can say that the educational games variable used in the research did not sufficiently help the students perceive themselves more positively in terms of parent relationships. A study conducted by Özcan and Üstündağ (2017) also supported these findings: there was not a significant difference in the experimental and control groups in regard to the students' parent relationships in the physical education lesson conducted with the eighth grade students and taught with educational games. On the other hand, Acat (2009) and Akpınar (2010) stated that games have an important impact on parental participation, school and education involvement and help the children continue to school eagerly, to increase their self-respect and to develop positive attitude toward school. This means that both school and family mutually affect each other. Most of the children games have a social structure. Through games, children gain gender identity and assume the roles of family members and learn the responsibilities and personalities of these members. Children understand the occupational groups and their roles, and learn to solve problems together thanks to games (Akandere, 2006). In the light of these explanations, it can be deduced that children's parent relationships can be improved through educational games. The fact that the findings of this research did not produce such an outcome may be related to the age characteristics of the students forming the research group. The children between 11 and 14 may feel themselves closer to their peers than their family members (Rizzo, 1988), which have a direct impact on their relations with their peers and family members. In fact, the results obtained in the previous peer relationships sub-dimension of the scale also support this result.

Table 5. Pretest-Posttest General Self-Concept Anova Results of the Experimental and Control Group Students

Source of Variance	Sum of Squares	sd	x	F	p
Intergroup	1.33	1	1.33	.022	.88
Error	1353.58	22	61.52		
Intragroup (Measurement)	8.33	1	8.33	.50	.48
<b>Group*Measurement</b>	<b>90.75</b>	<b>1</b>	<b>90.75</b>	<b>5.45</b>	<b>.029*</b>
Error	365.91	22	16.63		

\* $p < .05$

As understood from the table above, a comparison of pretest-posttest scores of the experimental group and control groups demonstrate a significant difference in favor of the experimental group ( $F_{(1-22)}=5.45$ ,  $p<0.05$ ). While the pre-experiment self-concept perception average of the inclusive students in the experimental group was 33.08, it increased up to 36.66 after the experiment. Self-concept perception average of the inclusive students in the control group, however, decreased from 35.50 to 33.58. In other words, we can say that the educational games variable used in the research helped the students perceive themselves more positively in terms of self-concept. When the literature in relation to the subject is examined, Özcan and Üstündağ (2017)'s similar study found that the self-concept perceptions of the eighth grade students decreased both in experimental and control groups in the posttest. This difference can be considered to be related to the difference in the study group. As is known, the high school entrance exam that eighth grade students attend in the spring semester in Turkey may have affected their self-concept perceptions negatively. A study indirectly supporting this result was conducted by Demirci et al. (2006), who asked the opinions of primary school first grade teachers about the effect of education with games on the child development: 99% of the teachers stated that education with games is important and increases the academic achievement of children. Furthermore, 97% of the teachers said that education with games facilitates children's learning and 95% of them said that education with games gives the chance to better understand the child. Also, 93% of the teachers stated that games and education with games are one of the basic needs of children and substantially affect their general development. In addition, Erdoğan (2006) examined the effects of creative drama studies conducted with 8th grade students having depressive symptoms on the depressive symptoms and self-concepts of these students. The study findings demonstrated that creative drama studies led to an apparent regression in the depressive symptoms of the 8th grade students and a positive increase in their self-concept levels. Considering the fact that creative drama is also an educational game, we can say that this study indirectly supports this research result.

## 5. Conclusion

When the general results of this research examining the effect of the educational games on the self-concept levels of the inclusive students are evaluated, it is seen that pretest scores of the experimental and control group students are at a good level in all sub-dimensions of the non-academic self-concept scale used in the research while in posttest scores, except for parent relationship sub-dimension, a significant difference in favor of the experimental group is seen in all sub-dimensions. This research result is an expected and desired one for the researchers. Detailed results of the research are as follows;

1. Physical competence perceptions of the inclusive students in the experimental group are significantly different compared to the students in the control group.
2. Physical appearance perceptions of the inclusive students in the experimental group are significantly different compared to the students in the control group.
3. Peer relationship perceptions of the inclusive students in the experimental group are significantly different compared to the students in the control group.
4. There was not any significant difference between the parent relationship perceptions of the inclusive students in the experimental group and the inclusive students in the control group.
5. Self-concept perceptions of the inclusive students in the experimental group are significantly different compared to the students in the control group.

## 5. Recommendations

1. The fact that this research has been carried out with a small research group is one of the major limitations of this research in terms of its generalizability. Therefore, the research can be applied to more students.
2. The limited number of similar researches in regard to the research subject has limited the comparison and evaluation of the research findings. We think that new researches on this subject will contribute to the field.
3. This research is limited only to experimental and control group independent variables. We recommend that researchers who will conduct research on this subject should add richness to research subject with different variables such as gender, class, academic average.
4. This research has proved that educational games have a positive and significant effect on inclusive students. Therefore, in-service trainings about educational games can be organized for all teachers who have inclusive students in their classes.

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