

## The Effect of Individual Attention Training Implemented on Students Without Attention Deficit Hyperactivity on The Skills of Focusing Attention and In-Class Activities

### Dikkat Eksikliği-Hiperaktivite Bozukluğuna Sahip Öğrencilere Uygulanan Bireysel Dikkat Geliştirme Eğitiminin, Dikkat Toplama Becerilerine ve Sınıf İçi Etkinliklerine Etkisi

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**Abstract.** The key characteristic of attention deficit hyperactivity disorder (ADHD) is the permanent and lasting shortness of attention span and the impetuosity and uneasiness that occur in the actions or cognition due to the lack of control intended for avoiding negative situations. The purpose of this study is to determine the effect of individualized attention improvement training program for students who are diagnosed with ADHD and receive education within the scope of inclusive applications on improving attention skills and accordingly to examine the attitudes of the primary school teachers towards their attention skills. In this study, both quantitative and qualitative methods were used. Pre-test /post-test control group experimental design was used for investigating the impact of the training program on students with ADHD. Descriptive method, one of the qualitative research techniques, was used to determine the impact of individualized attention improvement training that the teachers applied to improve the attention focusing skills of their students with ADHD. Bourdon attention test and teacher interview form were used as data collection tools. According to the findings obtained through quantitative data, it was found that individualized attention improvement training offered to students diagnosed with ADHD significantly increased their attention focusing skills, and the difference between average scores the experimental and control groups participating in the study obtained from the attention-level test was statistically significant. On the other hand, according to the findings obtained from qualitative data, teachers stated that vast majority of the students with ADHD had an increased level of both attention span and educational performance when compared to pre and post training.

**Keywords:** Attention, Attention Deficit, Focusing Attention, Hyperactivity, Individual Attention Improvement Training.

**Öz.** Dikkat Eksikliği Hiperaktivite Bozukluğu'nun (DEHB) temel özelliği, kalıcı ve sürekli olan dikkat süresinin kısalığı, olumsuz durumdan kaçınmaya yönelik denetim eksikliği nedeniyle davranışlarda ya da bilişte ortaya çıkan ataklık ve huzursuzluktur. Bu çalışmanın amacı, Dikkat Eksikliği ve Hiperaktivite Bozukluğu (DEHB) tanısı konmuş kaynaştırma öğrencilerine verilen Bireysel Dikkat Geliştirme Eğitiminin dikkat becerilerini geliştirmeye yönelik etkisini ortaya koymak ve bu doğrultuda öğrencilerin dersine giren sınıf öğretmenlerin öğrencinin dikkat özelliklerine ilişkin görüşlerini almaktır. Araştırma da nicel ve nitel yöntemler kullanılmıştır. Araştırmanın nicel boyutunda DEHB olan öğrencilere öntest-sontest kontrol gruplu deneysel desen kullanılmıştır. Araştırmanın nitel boyutunda ise öğretmenlerin DEHB öğrencilerinin Bireysel Dikkat Geliştirme Eğitimi'nin etkisini belirlemek amacıyla nitel araştırma tekniklerinden betimsel yöntem kullanılmıştır. Veri toplama aracı olarak Bourdon dikkat testi ve öğretmen görüşme formu kullanılmıştır. Araştırmada, nicel verilerinden elde edilen bulgulara göre DEHB tanısı almış öğrencilere verilen bireysel dikkat geliştirme eğitiminin öğrencilerin dikkat toplama becerilerinin önemli ölçüde arttığı, deney ve kontrol grubunun dikkat düzeyi belirleme testinden aldıkları puan ortalamaları arasındaki fark istatistiksel olarak anlamlı olduğu bulunmuştur. Nitel verilerden elde edilen bulgular ise öğretmenler, DEHB olan öğrencilerin eğitim öncesi ve sonrası kıyaslandığında, öğrencilerinin büyük çoğunluğunun hem dikkat süresinin hem de eğitim performans düzeyinin arttığını belirtmişlerdir.

**Anahtar Kelimeler:** Bireysel Dikkat Geliştirme Eğitimi, Dikkat, Dikkat Eksikliği, Dikkat Toplama, Hiperaktivite.

#### Public Interest Statement.

The purpose of this study is to determine the effect of individualized attention improvement training program for students who are diagnosed with ADHD and receive education within the scope of inclusive applications on improving attention skills and accordingly to examine the attitudes of the primary school teachers towards their attention skills.

#### Toplumsal Mesaj.

Bu çalışmanın amacı, Dikkat Eksikliği ve Hiperaktivite Bozukluğu (DEHB) tanısı konmuş kaynaştırma öğrencilerine verilen Bireysel Dikkat Geliştirme Eğitiminin dikkat becerilerini geliştirmeye yönelik etkisini ortaya koymak ve bu doğrultuda öğrencilerin dersine giren sınıf öğretmenlerin öğrencinin dikkat özelliklerine ilişkin görüşlerini almaktır.

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## 1. INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) characterized by problems with inattention, hyperactivity and impulsivity is one of the most common childhood disorders (Petermann & Hampel, 2009). The key characteristic of ADHD is the permanent and lasting shortness of attention span and the impetuosity and uneasiness that occur in the actions or cognition due to the lack of control intended for avoiding negative situations. Though first described by George Still in 1902 as "abnormal defect of moral control", ADHD has been explained by various theories in the course of time. In 1947, Strauss and his colleagues coined the term "minimal brain dysfunction syndrome". In the 1960's, the concept of "minimal brain dysfunction" was used to describe a group of children with no definite neurological disorders. Today, it is defined as a neuropsychiatric disorder that begins before 7 years of age and manifests itself through three main characteristics: inattention, hyperactivity and impulsivity (Barkley, 1996).

The primary symptoms of ADHD can be classified into three main categories; hyperactivity, inattention and impulsivity (Association AP, 2013; Bahçivan Saydam, Ayvaşık, Alyanak, 2015). It is really hard for children with ADHD to sustain their attention to activities or school tasks for a certain period of time. Those children exhibit a range of symptoms such as making hasty actions, being unable to sustain attention, making unplanned actions, behaviors including excessive motor activity and risks (Barkley, 1997; Döpfner, Schürmann & Frölich, 2006; Lauth, Kausch & Schlotzke, 2005). The fact that they are forgetful causes them to have difficulty paying attention to two or more sources of stimuli at once (Jacobs & Petermann, 2007). The problems that occur in a vast majority of the individuals with ADHD also continue into adulthood. In addition, ADHD is becoming one of the most important issues in society and health services in terms of personal development and social relationships. Today, ADHD is not considered a problem affecting only individuals. Affecting healthcare services and education policies in all countries, this case can cause lasting damage to the child's academic achievement, social life and future education process (Lauth & Schlotzke, 2002). Thus, early diagnosis of ADHD and provision of training services required for the treatment of the disorder are of great importance (Lauth & Schlotzke, 2002).

Although the exact cause of ADHD is not fully understood, a combination of many factors is thought to be responsible. Thus, it is required that interventions for ADHD should also be multimodal (Döpfner et. al. 2006). A review of available literature shows that there are several different types of medications used for the treatment of ADHD. The key element that differentiates the approaches depends on the central person of the intervention. These treatment options are based on the two important frameworks of school- and family-based interventions. Through family-based approaches and parent training programs, it is aimed to reduce problem behaviors facing families (Döpfner et. al., 2006; Petermann, Helmsen & Koglin, 2010). The purpose of school-based intervention approaches is to reduce disruptive behavior problems in children or adolescents with ADHD by using effective methods (Döpfner et. al., 2006). The point that should not be neglected in school-based intervention approach is that traditional school system is against the nature of a child with ADHD. Because children with ADHD need to be constantly in motion, and furthermore, poor concentration also reaches an undesirable peak point in the classroom setting. The problems of the child experiencing poor concentration and learning difficulties further increase and failure thereby becomes inevitable. A study examining the academic achievement of children with ADHD has revealed that 63 % of these children need particular support, 34% have repeated a grade, 20 % have studied in special education classes, 17% have problems with writing, and 20% have poorer math skills than expected. However, it cannot be said that academic failure is definitely inevitable among all children with ADHD. Despite all these negative aspects, there are also successful children with ADHD (Karaduman, 2004).

The factors that cause children with ADHD to fail in classroom setting are described by Learning Pyramid Theory called "building blocks of learning". Located at the base level of the pyramid, basic building block consists of four sections: attention/impulse control, emotions and behaviors, self-

confidence and learning settings (MEB, 2006). For a higher level of learning, it is necessary that the child with ADHD should gain the skills of focusing attention, his/her emotions and behaviors are appropriate. Processing building blocks where visual, auditory and tactile stimuli located on the middle level of learning pyramid are present, and verbal ability located at the top level of learning pyramid, the top block of cognition where mental image occurs can develop. When all these factors are not taken into account, children with ADHD who differ in many aspects notably in academic skills from their same-aged peers underutilize the learning environments within the class. Even if classroom measures towards these children are taken, some children with ADHD need more intensive support. In order to meet the educational needs of these children, it is required that training programs that will decrease their basic problems are organized, intensive-small group tutorings are offered, and the student is supported through Individualized Training Programs appropriate to his/her personal qualifications (Özdoğan, 2001).

A review of the literature shows that studies conducted with students diagnosed with ADHD to improve attention are quite limited. Within this context, this study is of great importance because an experimental study of individualized attention improvement program was applied to children diagnosed with ADHD and these practices were also tested by teachers' observations. Thus, the purpose of this study is to determine the effect of individualized attention improvement training program for the students who are diagnosed with ADHD and receive education within the scope of inclusive applications on improving attention skills and accordingly to examine the attitudes of the primary school teachers towards their attention skills. For this purpose, the progress child with ADHD displayed in his/her attention skills was examined by both the researcher and his/her teacher.

In accordance with this purpose, answers to the following sub-problems were sought:

1. Is the difference between the pretest and posttest average scores of the students with ADHD receiving and not receiving individualized attention skills improvement training in the attention test statistically significant?
2. Are there any changes in views of teachers of students with ADHD regarding the attention skills of the students who received individualized attention skills improvement training?

## 2. METHOD

### 2.1 Research Model

Mixed methods approach in which quantitative and qualitative methods were integrated was used in this study. Mixed methods approach (Greene, Kreider & Mayer, 2005) is described as "the planned use of two or more different kinds of data gathering in the same study".

In terms of quantitative methods, pre-test /post-test control group experimental design has been used for investigating the changes in attention scores of the students with ADHD. Pretest /posttest control group design requires fewer subjects and provides efficiency for the efforts spent depending on the same subjects for each process. Moreover, it enables the researcher to work in homogeneous groups, and determine the true effect of experimental treatment (Büyüköztürk, 2012). The purpose of the quantitative method used in this study is to identify the effect of individualized attention improvement training applied to children with ADHD.

Descriptive method, one type of qualitative research techniques, was used to determine teachers' attitudes towards individualized attention improvement training. Research data were collected using a semi-structured interview technique. The major benefit of a semi-structured interview technique to researcher is that it provides a more systematic and comparable information as the interview is conducted depending on the interview protocol prepared in advance (Büyüköztürk, 2012). The purpose of the qualitative method used in this study is to identify the effect of individualized attention improvement training offered to students with ADHD on classroom environment depending on the teachers' attitudes.

## 2.2 Participants and Their Characteristics

The participants of this study conducted upon the permission of Konya Provincial Directorate of National Education (No: 83688308-605.99-E.2780432) during the academic year 2015-2016 were composed of the mainstreamed students diagnosed with ADHD who were enrolled in schools in the center of Konya province and their teachers.

To participate in the study, students were selected in two phases. During the first phase, students were chosen based on the criteria that they are literate, attending 4th grade, and diagnosed with ADHD. The students with the specified criteria were assigned using a 'random sampling method' in the second phase. In this direction, experimental and control groups each of which consisted of 16 subjects were defined. Group members for each group were assigned through random placement. Parental permissions were obtained for students' participation in the study. While the number of female participants in the control group was 9 (56.25 %), 7 students were male. On the other hand, the experimental group was composed of 8 (50 %) male and 8 (50 %) female participants. All the teachers participating in the study were the primary school teachers of students in the experimental group. A total of 14 teachers took part in this study. 10 (71.4 %) were female, while 4 teachers (28.6 %) were male.

## 2.3 Data Collection Tools

This study lasted for 10 weeks during the spring semester of 2015-2016 academic year. Bourdon attention test and teacher interview form were used as a data collection tool in this study.

### 2.3.1 Bourdon Attention Test

The latest version of Bourdon attention test was developed by Benjamin Bourdon in 1955. There are two different forms of Bourdon attention test. The first one involves finding and marking specific letters among mixed typescripts, while the second one involves finding and marking specific shapes among mixed shapes given. The test requires an uninterrupted attention of the participants. There are 660 letters in the letter form. The shape form is 1-page long and consists of 450 small shapes. Although there is no age limit for the application of the Bourdon test, participants should be capable of identifying letters for letter form to be able to take the test. For the evaluation of the test, the number of true answers and mistakes or time can be taken into consideration. During the evaluation process, the implementer may count how many correct answers the children provided in a certain length of time, and without taking time as a determinant they can control how many answers they marked as correct or whether they marked another letter or shape other than the letters or shapes required to be marked. There is no specific template created. The implementer himself can determine which letters or shapes should be marked and create his/her own template (Brickenkemp, 1975). In a study conducted by Karaduman (2004), validity and reliability studies of Bourdon Attention Test were done. The test was applied twice at a 15-day interval for totally 150 participants composed of fourth and fifth grade students. The correlation coefficient between two evaluations was found as .78.

For the assessment of the test, the correct answers provided by participants were taken into account. Each correct answer was worth one point. The highest point that might be taken from the test was set at 118 points. The increase in the participant's score indicated that there was an improvement in his/her attention level. Before and after the experimental study, Bourdon attention test was applied to both experimental and control groups. This test used during the collection of research data was applied to both groups within the same week.

### 2.3.2 Teacher Interview Form

A teacher interview form was developed for the interviews with the teachers. During the first phase, the form was released as a draft by examining the field studies. In the second phase, a total of 9 questions were created based on the information obtained from the literature regarding the content of the study. In the third phase, after the interview form was checked by three experts having experience in qualitative research, test items were rearranged in accordance with views and

feedbacks provided by the experts, and five items considered inconsistent with the content were removed and the new forms involving rearranged items were once again sent to the experts for a further review. In the fourth phase, the items shaped based on the suggestions involving the final reviews of the experts were ready for use in a pilot study with four basic questions. In the fifth phase, questions in the interview form were applied to three teachers for the pilot study and some alterations concerning the incomprehensible expressions were made based on the teachers' views and one more question was removed from the study. Being put into final form composed of three questions, semi-structured interview forms were made available for use in the study. During these interviews, teachers' answers to questions concerning students' attention span and activities they focus attention and what precautions can be taken to improve their attention span were analyzed. Interviews were conducted using a voice recorder. The audio recordings of the interview were transcribed shortly after the interview. Data obtained through the interviews were analyzed using descriptive statistics.

In the data collection process, teachers were first asked whether they agreed to participate in the interviews. The qualitative data were obtained from teachers of the students participating in the experimental group through 15-30 minute semi-structured interviews conducted at the beginning and end of the experimental study. Teachers were informed prior to interviews that the study aimed to determine the length of attention span for students with ADHD and their characteristics of focusing attention.

#### **2.4 Process**

In the early stages of the study, Bourdon attention test was applied to both experimental and control groups. In addition, interviews were conducted with teachers of the students participating in the experimental group. The study was conducted individually in the resource rooms at three different schools. When performing the activities, great attention has been paid to the fact that there should be no factors in learning environment that could distract students' attention, students feel comfortable, they all have a different learning speed; exercises should be simple to complex. During the activities, exercise book, pencil and an eraser were used as materials.

After a comprehensive literature review regarding the content of individualized attention skills improvement training was conducted, related attainments were listed as simple to complex by the researcher. After that, preparations for creating the content of ten-week training program started. During the process of preparing the training content, books published in the category of attention improvement such as "Training mit aufmerksamkeits-gestörten Kindern" by Lauth and Schlotke (2002), "Dikkati Güçlendirme ve Hafızayı Geliştirme" by Başaran (2010) and "Dikkat Toplama Becerisini Geliştirici Etkinlikler" by Kaymak Özmen (2015) were used as reference books. While the content of the training prepared by the researcher was being established, activities were created by the researcher based on the views obtained from three expert judges. A training manual was prepared for use in the training.

Related activities were implemented by the researcher for each student in 2 days per week within a duration of 10 weeks, totally 20 sessions in the spring semester of the 2015-2016 academic year. At the end of the study period, Bourdon Attention Test was re-applied to the experimental and control groups. The interview form was once again directed to teachers of the experimental group students. Qualitative and quantitative analyses that would reveal whether there was an increase on the students' attention skills and capacity of focusing attention following the attention improvement training were conducted. Below short contents relating to activities for the sessions in individual attention improvement training were provided.

*Session 1:* Bourdon attention test was applied, a short presentation about the training objectives was made and the importance of concentration was explained.

*Session 2:* The objects or events that distracted their attention were discussed and students were made aware of the distracting factors. Activities such as “Fill in missing words” and “Finding the underlined letters” were conducted.

*Session 3:* Exercises for focusing attention were done. Activities such as ‘describing the pictures they are shown’, ‘marking the given shapes’, ‘finding the similar shapes’, ‘putting the points’ and ‘writing the names of animals’ were conducted.

*Session 4:* Exercises for focusing attention were done. Activities such as ‘sorting by size’, ‘word finding’, ‘marking words’, ‘spotting the differences’ and ‘completing the missing parts’ were performed.

*Session 5:* The child was asked to retell the story read to him/her. “Picture completion, combining letters, spotting the difference, and completing the missing parts of the shapes” activities were performed.

## 2.5 Data Analysis

SPSS 18.0 for Windows software package was used to analyze the quantitative data in the study. Given that the data fits the assumptions of the analysis, the paired sample t-test, one of the parametric statistical methods, was used to assess the correlation between pretest and posttest within each group. In this study, the independent-samples t-test, one of the parametric statistical methods, was used to compare pre-test and post-test scores between groups.

After the interviews with teachers were completed, transcripts of data were entered into the interview forms by the researcher without making any changes in the recordings. All the interviews written down for each participant who took part in the interview were separately assessed. Qualitative data obtained through the research were analyzed using the descriptive statistics, one type of quantitative research methods.

## 3. RESULTS

### 3.1 Findings Related to the Effect of Individual Attention Improvement Training

By examining the outcomes of the implemented test results on the control and experimental groups, the effect of Individualized Attention Training on the attention of students with ADHD was determined. Pre-test and post-test academic achievement scores of students in the experimental and control groups were compared using independent samples t-test and the results are presented in Table-1.

**Table 1.** Independent Samples t-Test results relating to the significance between control and experimental groups of the Individualized Attention Training pre-test and post-test scores

Attention Training	Group	N	$\bar{x}$	ss	sd	t	p
PRE-TEST	Experimental	16	85.43	12.67	30	0.904	.373
	Control	16	82.00	8.422			
POST-TEST	Experimental	16	105.1	4.19	30	9.86	.000
	Control	16	84.0	7.46			

\*There is a significant difference at  $p < 0.05$  level.

As indicated in Table 1, as a result of independent sample t-test conducted to assess the pre-test scores of control and experimental groups, no statistically significant difference relating to their attention between groups was found [ $t(30)=.904$ ,  $p>0.05$ ]. This finding shows that control and experimental groups had a close attention level before the treatment. When the pre-test results of the Individualized Attention Improvement Training in Table-1 were examined, the arithmetic mean of the experimental group was 85.43 and the standard deviation was 12.67, while the control group had an arithmetic mean of 82.0 and a standard deviation of 8.42.

When the post-test scores of the control and experimental groups were examined using an independent sample t-test, a significant difference was found in favor of the experimental group [ $t(30)=9.86, p<0.05$ ]. When the post-test results of the Individualized Attention Improvement Training in Table-1 were examined, the arithmetic mean of the experimental group was 105.1 and the standard deviation was 4.19, while the control group had an arithmetic mean of 84.0 and a standard deviation of 7.46.

### 3.2 Findings Related to Teachers' Views

This section describes the views of teachers of the students with ADHD who participated in the experimental group.

#### 3.2.1 Teachers' views regarding the length of attention span of their students with ADHD

In the interview conducted with teachers of the students in the experimental group before the training started, a great majority of the teachers (10, 71.4%) stated that attention span of their students is about 5 to 10 minutes long, but it may be even shorter depending on student's mood and classroom environment.

Four teachers (4, 28.6%) stated that their students are at different learning levels, and inclusion of students with special needs into their classes further increases the problem.

"It is really difficult to know the exact figure of attention span for students with ADHD. Because their attention spans are highly variable and a relatively trivial event can hinder students with ADHD from staying focused on lectures all day long (Teacher 11)".

"I don't believe it is appropriate to integrate students with ADHD into regular education facilities in the same class with his peers because he can stay silent up to 5-10 minutes in a class period of 45 minutes, thus this situation negatively affects both himself and other peers (Teacher 2)".

In the interview conducted with teachers of the students in the experimental group after the training sessions were completed, several of the teachers (5, 35.7%) stated that the length of time they remain quiet within the class has significantly increased, but it makes no demonstrable contribution to student success.

The vast majority of the teachers (9, 64.2 %) stated that as his/her attention span increases, student's success also increases. They also stated that this change has a positive effect on the length of time he/she spends at school and in other areas. Excerpts related to the views of teachers on the subject are presented below.

"I began to realize the impact of the application on the attention span in the third week after the training began and I expected it could have a positive effect on academic success as well. However, I couldn't observe an increase in the academic success as much as in attention span. Therefore, I am of the opinion that it would be useful if the training were a bit longer (Teacher 8)".

"My student was experiencing a serious concentration problem. I tried a lot to deal with it but I failed. He always stated that he fondly participated in your activities during the training. Furthermore, his academic performance also increased and I realized he had a 20-minute attention span, which was about 10 to 15 minutes long before the training (Teacher 10)".

#### 3.2.2 Teachers' views about the activities students with ADHD focus on

In the interview conducted with teachers of the students in the experimental group before the training started, a great majority of the teachers (12, 85.7%) stated that their students concentrate on extracurricular activities and artistic works for a longer period of time and their impetuous behaviors during the class activities, failure and inattention are the factors that trigger one another. Excerpts related to the views of teachers on the subject are presented below.

"We are conducting activities relating to the specified attainments easier for this student. I advise him to do the activities slowly while telling that I give you such time, but he always finishes it in a quick way. I give him extracurricular activities to make him get involved with something so that I can give my lecture. I feel like we are delaying him/her, which really bothers me (Teacher 12)".

In the interview conducted with teachers of the students in the experimental group after the training sessions were completed, a great majority of the teachers (11, 78.5%) stated that they observed the fact that besides their students were involved in extracurricular activities, they also participated in the tasks and activities about the lesson as a result of the increase in their attention span within the class. Excerpts related to the views of teachers on the subject are presented below.

“My student is a smart one but his short attention span has a negative effect on his attitudes within the class. Thus, he is oriented towards activities that do not require thinking. Nevertheless, I can easily realize that the training has increased his interest in school subjects. The increase in his attention span has greatly made major contributions to his being active in classroom tasks as well (Teacher 2)”.

### **3.2.3 Teachers' views about measures to improve attention span of students with ADHD**

Although all of the teachers who participated in the interview (14, 100 %) used different expressions, their answers to this question indicate that they hold the same opinion. Before the experiment, the teachers stated the measures that might be taken should involve general expressions and be mostly physical arrangements. They also used similar expressions about that the distracting objects within the class should be cleared away, additional tasks should be given so that students can focus their attention, and the directions should be clear and brief when communicating with these students. Excerpts related to the views of teachers on the subject are presented below.

“It is required that distracting factors in the classroom setting should be arranged appropriately to the students by taking their attention skills into account within the training process. When realizing that they have become distracted, small tasks can be given to make them focus attention. For example, giving them tasks such as ‘get the pencil from the bookshelf’ or ‘sharpen the pencil’ enables them to walk around and sit at their desks again. Another measure we can take is to use simple and clear language when talking to the student (Teacher 9)”.

After the experimental treatment, measures that might be taken for children with ADHD were specifically determined as physical arrangements and educational measures as well. They highlighted that students with concentration problems should definitely receive special education to increase their attention span as they themselves realized the fact that the training provided to their students had a major impact on this matter. In addition, they stated that settings cleared away from distracting factors during the training should be designed, and it can be helpful to use different types of teaching methods and techniques. They stated that their problems should be investigated in terms of nutrition as well. Excerpts related to the views of teachers on the subject are presented below.

“I hold the view that attention enhancement training should be definitely generalized for these students. Based on my own experiences, I often try to do activities that will enhance their attention and I have never yielded benefit as high as the one following the individualized attention training offered to students. However, I can adapt the classroom environment to his/her needs in order to support a student for whom individualized attention training is provided and make suitable arrangements for him/her during the assessment process (Teacher 11)”.

This finding indicates that Individualized Attention Improvement Training implemented in the experimental group is a more effective program for enhancing students' attention levels when compared to the training implemented in the control group.

## **4. DISCUSSION**

Man is a biological entity who tries to adapt to his environment, responds to situations he faces, perceives external stimulus and makes systematic choices among them, interprets choices he has made based on his own conscience throughout his life. ‘Recognition of stimuli into perceptual consciousness systematically’ is explained by the concept of attention (Amado, 1996). Besides having vital role in daily life, attention is one of the basic aspects of cognitive processes in



education and working life as well. An individual cannot respond to all the stimuli at once because he/she has a limited capacity. Thus, the brain responds selectively to certain types of stimuli occurring under the effect of certain variables (Karaduman, 2004). This situation becomes a bit more challenging for children with attention deficit/ hyperactivity disorder. Attention deficit/ hyperactivity disorder is a common disorder among school-aged children, which leads to academic, behavioral and social difficulties in a school setting (Simon, 2016). Children with ADHD have difficulty sustaining attention to activities or school tasks for a certain period of time. Those children exhibit a range of symptoms such as making hasty actions, being unable to sustain attention, making unplanned actions, behaviors including excessive motor activity and risks (Barkley, 1997; Döpfner, Schürmann & Frölich, 2006; Lauth, Kausch & Schlottke, 2005). Ettrich (1998) suggests that attention and attention focusing skill are of great importance at every period of school life, and particular attention should thereby be given to improving concentration skills starting with the preschool period so that the educational problems that may arise in the following years can be minimized. A review of the relevant literature shows Ettrich (1998); Helmke & Renkl (1993); Lauster (1999); Özdoğan (2001) suggest that concentration skills can be improved through education programs.

Depending on the importance of concentration skills in the educational process, the purpose of this study was to determine the effect of individual attention improvement training program for mainstreamed students diagnosed with ADHD on improving their attention skills and to investigate teachers' views of their students' concentration skills.

In 'Learning Pyramid Model' which explains the building blocks of learning, the major one among the building blocks is attention/impulse control (Özdoğan, 2001). It is an unavoidable fact that children with ADHD should have the concentration skills attention for a further learning. As a result of the study, we came to the conclusion that individual attention training program increased the concentration skills existing in the building blocks model for learning. We verified the result through teachers' observations. This result shows parallelism with experimental studies that reveal the importance and impact of operant conditioning methods that lay emphasis on the school-based interventions techniques for ADHD and cognitive approaches (Döpfner, 2000; Döpfner & Lehmkühl, 2002; Döpfner & Lehmkühl, 2002c; Lauth vd., 2005). Nevertheless, it can be clearly seen from these studies that treatments for children with ADHD are often conducted in a group setting, and individual therapies are limited (Lauth & Fellner, 2004). As stated by Lauth & Schlottke (2001), it should be noted that children with ADHD should be offered traditional classroom practices based on individualized learning. In our study, unlike Lauth and Schlottke's (2001) group studies, individualized attention training program was implemented considering students' personal characteristics.

In a study conducted by Özmen (2011), the effect of multimodal training programs on students with ADHD was analyzed and similar results were obtained as demonstrated in our studies. However, it is necessary to take into consideration that it can be difficult to generalize a study having a limitation and a single subject called as the multimodal effect caused by the research design. In our study, implementation of attention training program for students on an individual basis enabled us to generalize and compare the changes in the experimental and control groups. From this aspect, our research doesn't have the limitations caused by the single subject research conducted by Özmen (2011).

A review of the relevant literature shows that attention training programs have been implemented to increase the available concentration power in students without ADHD (Karaduman, 2004; Özmen, 2011). In our research, unlike other studies, the effectiveness of attention training program for students diagnosed with ADHD and their capacity related to attention skills were investigated through Burdon attention test.

Another consequence is that primary school teachers of the students provided with individual attention training realized the fact that their attention within the class increased. This finding

differs from other studies conducted in the field. From this aspect, such an analysis will provide insight into further studies. Because the fact that an implementation was also recognized by those responsible for teaching students is an indication that its generalizability feature has strengthened. But teachers' expectations regarding the conducted practices and the fact that it could have a positive effect on the result are among the limitations of the study. Another limitation of the study is that the effect of the increase in the students' attention levels on their academic success, problem-solving and decision-making skills has not been assessed.

## 5. CONCLUSIONS AND RECOMMENDATIONS

In this study aiming to determine the effect of individual improvement training program for children diagnosed with ADHD on improving their concentration skills, the following results were reached:

Based on the findings obtained from the research data, it was determined that individual attention improvement training for students diagnosed with ADHD significantly increased their concentration skills.

According to the study results, the difference between average scores obtained from the attention level test of the experimental and control groups participating in the study was statistically significant.

According to the study conducted with teachers in the qualitative dimension, it was concluded based on the answers they provided to the question about the length of attention span of students with ADHD that the longer their attention span, the greater their academic achievement.

Based on the answers the teachers provided to the question addressed to themselves about activities the students with ADHD focus on, it was concluded that as a result of the increase in their attention span, students who often dealt with extracurricular activities before, participated in subjects or activities relating to school tasks more after the training.

Based on the answers the teachers provided to the question addressed to themselves about measures to improve attention span of students with ADHD, teachers' answers following the study greatly differed when compared to those prior to the study. It was concluded that physical arrangements can be designed as well as educational measures and special education should be provided.

In accordance with these results, such recommendations can be made for further studies.

1. All ADHD-diagnosed students receiving educational support should be provided with individual attention training in the resource rooms to improve their attention skills.
2. A curriculum in which 'individual attention training' is conducted by parents, primary school teacher and special education teacher together can be developed.
3. A curriculum should be developed to improve the other developmental areas, where inabilities of the students diagnosed with ADHD is affected together with attention.
4. Individual attention training appropriate to different attention levels and different age groups can be designed through the individualized education programs developmentally suitable for children.
5. Through the use of individual attention training program, student's academic performance can be investigated.
6. Areas such as problem-solving and decision-making, another challenge facing students with ADHD, can be assessed through various measuring instruments.

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