



## Implementing Differentiated Instruction Approach in Physical Training and Sports Lesson \*

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### Abstract

Since this study aims to test the applicability of differentiated instruction approach in 5<sup>th</sup> grade Physical Training and Sports lessons, it was designed as an action research. The study was conducted as part of 5<sup>th</sup> grade Physical Training and Sports lessons. The application was carried out as a whole class activity; however, the data obtained from 8 focus students was analyzed in more detail. The research used “centers” and “stations” strategies of “differentiated instruction”. The qualitative data of the study was collected through “video recordings”, “reflective journals”, “learner diaries” and “semi-structured interviews”; and quantitative data by administering the “Physical Training Course Attitude Scale”. The quantitative data was analyzed by using “SPSS for Windows 22”, and qualitative data through descriptive analysis. The qualitative analyses revealed that there was a significant increase in the post-test scores of students regarding their attitudes towards “physical education and sports course” when compared to pre-test scores. In addition, the data showed that students actively participated in the lessons, practiced more moves, socialized and developed the habit of working in teams, learned how to study independently and obeyed classroom rules. In addition, there was a considerable increase in the cases of interaction among students, and they were more aware of their responsibilities. The students also developed a positive attitude towards showing respect to individual differences. Finally, the use of both product and process evaluation methods created positive results, and process evaluations made valuable contributions to the planning of the following lessons.

The study concluded that it is possible to implement differentiated learning and organize this teaching process by applying a variety of strategies.

### Keywords

Differentiated instruction  
“Centers” strategy  
“Stations” strategy  
Physical education and sports  
Action research

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## Introduction

Rapid developments and changes in technology in today's world have naturally led to important changes in social life and social systems such economy, politics, law, international relations, health, security, transportation and manufacturing. As a result, such developments have changed the life styles, mentalities, demands and needs of individuals to certain extents.

It is no doubt that the developments mentioned above have had significant effects on education systems. The main function of an education system is to educate individuals who can easily adapt themselves to the changes in social life and help society to improve and continue to exist. This function is often realized in a variety of formal and mass education institutions. In other words, these institutions aims to provide individuals firstly with basic level knowledge, skills, attitudes and values, and later with the necessary qualifications for higher education and working life (Sağlam, 2011).

In order to fulfill this function, certain educational programs are prepared for different school types at different education levels. However, the expectations and interests of students are changing rapidly all over the world, and individual differences do matter more and more. Thus, it is necessary to plan educational activities in a student-centered way so that they can improve each student as a whole.

Cognitive, physical, psychomotor, emotional and social dimensions play significant roles in the development of individuals (Demirhan, 2006). Therefore, teachers should take these dimensions into consideration while planning their lessons and design teaching activities that are suitable for individual differences. Since each student is unique, it might be necessary to employ a different teaching method for him/her. Physical training and sports lesson is one of the lessons in which individual differences stand out because each student has a different capacity to perceive and perform a move shown in these lessons.

Physical training and sports lessons are important in that they increase students' self-confidence and socialization. Thus, a well-structured physical training and sports lesson will increase participation in lessons and considerably contribute to the personal development of students. If students spend quality time in physical training and sports lessons, they are more likely to participate in sports activities in their future educational institutions and throughout their lives (Griggs, 2012). If teachers of physical training and sports lesson want to increase their students' motivation and help them to develop positive attitude towards the lesson, they should employ a teaching method which takes individual differences into consideration and prepares students to learn at their own pace. One of these methods is "differentiated instruction approach", in which teachers should take their students' learning needs into consideration while organizing his / her teaching program (Tomlinson and Mc Tighe, 2006). The most important key to a successful program in this approach is careful planning. Daily lesson plans and unit-based plans should be carefully prepared in order to meet students' needs (Fox & Hoffman, 2011).

The review of the related literature revealed a large number of studies conducted abroad focusing on differentiated instruction (Tricarico & Hoppey, 2012; Santisteban, 2014; Little, McCoach, & Reis, 2014; Marinescu, Tudor, Mujea, & Baisan, 2014; Mujea, 2014; Subban & Round, 2015). There are only few studies conducted in Turkey focusing on the implementation of "differentiated instruction" in Turkish, Mathematics, Science and English lessons as well as its use with gifted students (Avcı, Yüksel, Soyer, & Balıkçioğlu, 2009; Yabaş & Altun, 2009; Kaplan, 2013).

### ***Differentiated Instruction***

Differentiated instruction, which is not a new concept, is an approach suggesting that teachers should differentiate their teaching process in order to meet the needs of individual students in a classroom environment (Anderson, 2007). In other words, it is an educational approach used to organize teaching process so as to meet individual needs of students and promote their learning by increasing their motivation (Good, 2006).

According to Tomlinson (2005), "Differentiated Instruction" is based on the idea that students learn better when their readiness level, interests and learner profiles are taken into account (as cited in Subban, 2006). "Differentiated Instruction", which is based on constructivist learning, provides students with the opportunities to construct their knowledge by using their learning styles and abilities (Robinson, Maldonada, & Whaley, 2014). This approach is flexible because it is quite suitable for group works, and students can join working groups and activities in a heterogeneous classroom. The students' active participation in lessons is very important for academic success (Manning, Kinzie, J., & Schuh, 2006), so it is necessary to use different and various teaching methods and techniques. One way to achieve that purpose is to employ "Differentiated Instruction". Tomlinson (1999) explains the principles of the approach that teachers may take into consideration while employing it in their own teaching contexts:

- ***The teacher focuses on necessary topics:*** In differentiated instruction, the teacher should carefully structure the teaching process according to the skills, principles and concepts needed to learn about each topic.
- ***The teacher is careful about individual differences.*** In a differentiated class, the teacher accepts students as they are and aims to improve their knowledge at their own pace.
- ***Assessment and teaching complement each other:*** In a differentiated class, assessment is continuous and determinant. The aim of the assessment is to obtain daily data about students' opinion, abilities, interests and learning profiles.
- ***The teacher changes the content, process and product:*** The teacher should change the content, process or the product by using the data obtained from the assessment process.
- ***All the students must be encouraged to participate in the lessons:*** In a differentiated classroom, the teacher;
  - ✓ Respects the readiness level of each student.
  - ✓ Expects that all the students progress and improve continuously
  - ✓ Provides opportunities for students to comprehend the content and skills depending on their difficulty level, so students continuously improve their knowledge and skills.
  - ✓ Treats each student fairly, cares about them and assigns equal tasks for each.
- ***Teachers and learners collaborate during learning process:*** Students and teachers plan, set goals, monitor the process, analyze achievements and failures together, and they take lessons from failures. Students know that the teacher will help them whenever they need.
- ***The teacher guides both group and individual activities.*** In a differentiated classroom, the teacher supports both group works and individual works.
- ***The teacher and students work together in a flexible way.*** In a differentiated classroom, the teacher and the students work flexibly to meet various learning needs. There might be whole class or small-group activities. Sometimes, the teacher decides on what to do, and sometimes he decides together with students. As we can understand from the definitions above, differentiated instruction employs various strategies to address individual differences (Tomlinson, 2000). No matter how the lessons are organized, there will be differences in students' interests, academic and social skills, development levels and learning profiles (Ernest,

Heckaman, Hull, & Carter, 2011). In this approach, teachers believe that students are unique in learning and self-expression and have different learning styles (Demos & Foshay, 2009). However, many classrooms are one-directional rather than being based on differentiated learning-teaching process. Since most teachers have not used differentiated instruction method so far, they assume that traditional teaching methods is more suitable for their educational contexts. Giving a lesson by using differentiated instruction method is thought to be difficult in terms of classroom management (Tomlinson, 2001). It is seen that the differences given in Table 1 emerge when comparing the differentiated teaching with traditional difference and the classes in which the traditional teaching is performed:

**Table 1.** The Comparison of Traditional and Differentiated Classrooms (Tomlinson, 1999)

<b>Traditional Classrooms</b>	<b>Differentiated Classroom</b>
Individual differences are taken into consideration only when a problem occurs	Individual differences are considered the basic factor affecting the planning
Assessment is carried out at the end of the process to see who learned well.	Assessment is continuous, and it aims to determine the efficiency of learning in order to meet learners' needs more and more in the following lessons.
A relatively limited intelligence mentality is dominant.	It focuses on multiple intelligences
There is one single definition of "perfection"	Perfection is defined according to the starting point of individual development
Students' interests rarely matter.	Students are provided counselling services to introduce the options for effective learning according to their fields of interests
Relatively fewer learning profile options are taken into account	Students are provided with various learning profile options
Whole class teaching is the common practice	A wide variety of teaching forms are employed.
The content related to the topic and educational program guides the learners during learning.	Instruction is shaped according to learners' interests, readiness levels and learning profiles
Out of context skills and mastering in these skills are in the center of learning.	The use of skills necessary to understand and make sense of important concepts and principles is central to learning.
Single-option tasks are common	Multi-option tasks are often used
Time is not flexible	Time is managed flexibly according to the needs of the students.
Only one material is used	A variety of materials are provided
There is one single interpretation for events and ideas	Events and ideas are analyzed from different dimensions and point of views
The teacher orientates students' behaviors	The teacher helps students develop their skills to make them self-confident individuals.
The teacher solves the problems.	Students help each other and student solves the problems
The teacher applies the same standards for all students in terms of assessment	Students work with the teacher to achieve whole class and individual learning goals
Generally, one single assessment form is used.	Students are assessed in many ways.

As we can understand from the comparison made above, the lessons planned according to traditional teaching methods assume that students are the same and ignore their individual differences, readiness levels, interests and learning profiles. This situation will not allow students to learn at their own pace, and they will find it difficult to be aware of their abilities. Therefore, it is important to apply differentiated instruction. There are many strategies used in this approach, and “centers” and “stations” strategies are two of them.

**Centers Strategy:** This strategy has been preferred by teachers for a long time since it is flexible enough to meet students’ needs. “Centers” are defined and used by teachers in different ways (Tomlinson, 1999). This strategy provides a sort of flexibility for teachers and might be applied in many ways. “Centers” is a strategy designed to help students in a classroom learn the content offered to them simultaneously, but in different ways (Roberts & Inman, 2007; as cited in Karadağ, 2010). Each strategy used in education provides different ways to reach students (Good, 2006). Indeed, differentiated instruction and different strategies used in this approach have been designed to reach students and improve their knowledge at their own levels.

In differentiated instruction, two types of centers are especially useful: *learning centers* and *interest centers*. *Learning centers* are designed to aim to teach, motivate and to help them acquire a specific skill or concept. They involve activities and materials serving for these purposes. Interest centers aim to motivate students and encourage them to search information in a specific area of interest. Centers generally have the following features (Tomlinson, 1999):

- They should focus on important learning goals.
- They should involve materials that have the potential to encourage students’ self-development in order to achieve these goals.
- They should employ materials and activities suitable for student’ reading levels, learning profiles at a very wide range.
- They should contain activities ranging from simple to complex, from abstract to concrete and from structured to open-ended ones.
- They should provide clear and direct instructions.
- They should provide students with instructions to follow when they need help.
- They should provide instruction about what to do when the tasks in a specific center are completed.
- They should employ a log system to track students’ tasks and their progress.
- In a general sense, they should include a plan for continuous assessment to restructure the tasks in centers and to track students’ progress.

Learning centers can be used in every class since they provide flexible implementation procedures. They can be adapted according to the individual differences. In addition, this strategy encourages students to assume responsibility for their own learning, and teachers plays the “guide” role here. In short, learning centers can be said to be a concept contributing to the students’ skill development (Smith & Throne, 2007). Learning centers can be employed in many areas, and physical training and sports lesson is one of them.

**Stations Strategy:** They are the different spots where students work on different tasks at a specific time. They can be used for a wide range of topics and with learners at every age. Stations can be marked as symbols or colors, or teacher can ask for students’ opinion for this marking (Tomlinson, 1999). Learning stations also provide opportunities for peer learning (Fox & Hoffman, 2011). “Stations strategy” was integrated into educational programs following the influence of constructivist approach and brought a new mentality to education. According to Manuel (1974), this is a system in which a

logically sequenced series of commands are given to students to help them achieve specific goals, and assessment procedures are clearly stated (as cited in Erdağı & Önel, 2015). “Stations strategy” allows students to work in different stations depending on their goals. In other words, each station has a different activity.

It is important to have flexible groups for the activities in stations because students do not have to work on all stations. Similarly, they do not have to spend the same amount of time in each station (Tomlinson, 1999). The teacher guides students accordingly; that is students might be allowed to choose the stations they would like to work in depending on the topic covered.

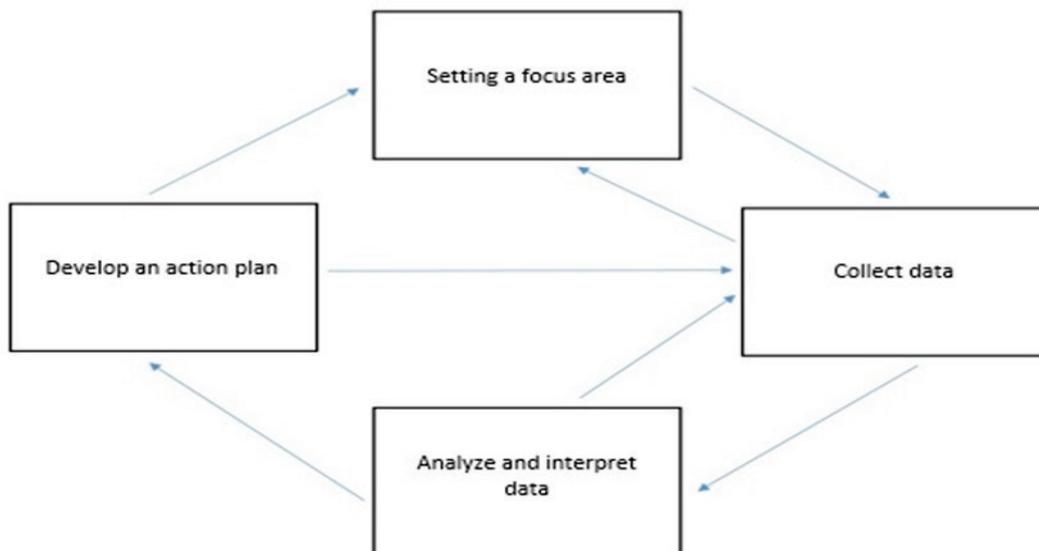
The study aims to investigate whether differentiated instruction can be implemented in physical training and sports lessons.

## Method

**Research Model:** This study was designed as an action research since it aimed to describe how differentiated instruction can be implemented in physical training and sports lessons. According to Mills (2003), “action research” is a systematic process through which teachers, administrators, school counselors collect data about their students’ learning or their teaching practices in their own educational environments. In addition, action research involves systematic data collection and analysis for the purposes of exploring and understanding a problem and finding a solution for it (Yıldırım & Şimşek, 2005).

### *Action Research Process*

It can be said that action research is triggered by a problem and continues until a sufficient amount of data regarding a solution to this specific problem is obtained. Mills (2003) defines action research process through the “dialectic action research cycle” as shown in Figure 1.



**Figure 1.** Dialectic Action Research Cycle (Mills, 2003, p. 19)

**Determining the Focus Area:** The focus area of this study was triggered by a speech given by a Dutch academician in an international conference, where the researcher attended herself. The use of “differentiated instruction approach” in physical training and sports lessons, which was the topic of the presentation, inspired the researcher to focus on this issue. One reason for that choice is that the researcher wanted to see whether differentiated instruction approach can be implemented in physical training and sports lessons.

**Data Collection:** Action research is a systematic process, so it is necessary to plan in advance which data to be collected, and when, how and how often it will be collected (Johnson, 2005). In this research, the data was collected both during “focus area determination phase” and during the “implementation of the action plan”. Later, they were comparatively analyzed.

**Data Analysis and Interpretation:** The main purpose of qualitative research is to determine a situation that causes a difference as well as its important characteristics. This purpose can be achieved through data analysis, which requires the researcher to make continuous examination of the data collected so that he / she can define the information related to the problems focused on (Stringer, 2008). In other words, the researcher can reach a conclusion about the problem by interpreting the analyzed data. To achieve that purpose, the regularly collected data were analyzed throughout this study and presented to validity committee in certain intervals.

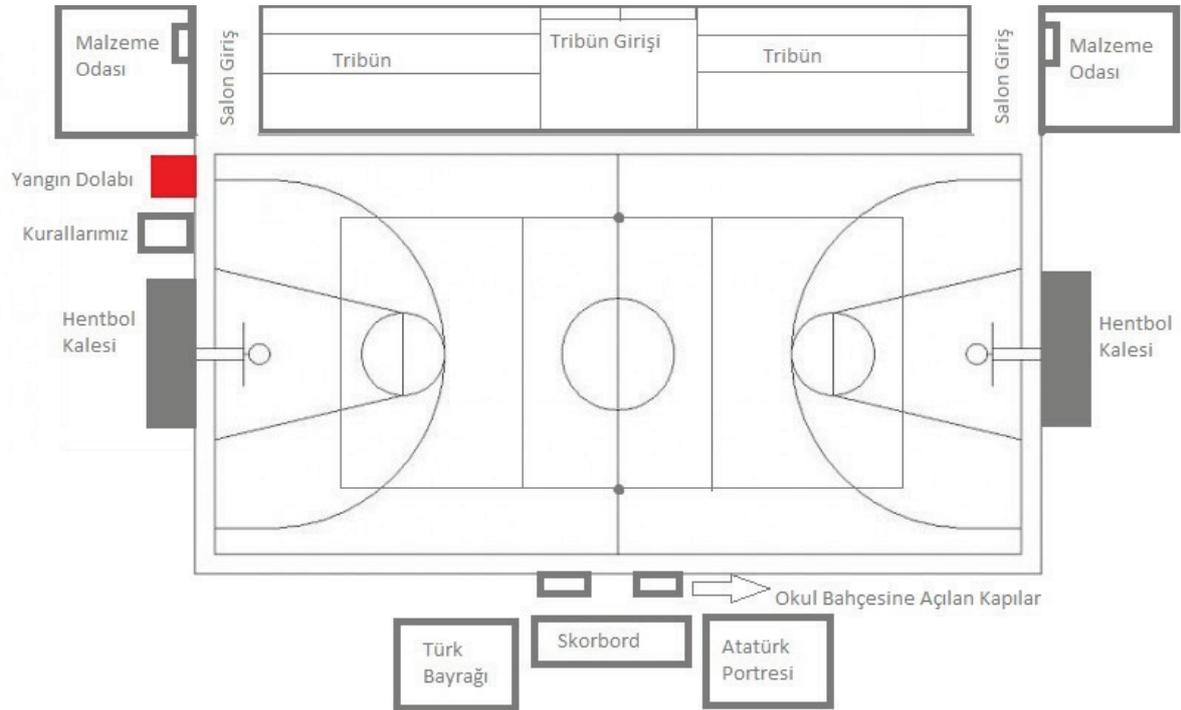
**Developing an Action Plan:** The strategies to be used in Differentiated Instruction Approach were determined based on the analysis and interpretation of the data obtained throughout the process as well as from the literature review. These strategies were taken into consideration in the action plans, which were finalized and applied following the negotiations with the validity committee members and the interviews conducted with the physical training and sports teacher.

The researcher identified the factors leading to certain problems during the implementation and determined a series of precautions to eliminate these factors or reconsider them within the framework of a long-term and systematic plan (Yıldırım & Şimşek, 2013). The data obtained throughout the study were regularly examined, and necessary changes were made in the action plans when necessary. The action plans were revised in a way to cover all the students and reflect the approach effectively. The lesson plans were prepared in conformity with the educational program issued by the Ministry of National Education. The activities in these plans that served for the purpose of the study were included in the study while those that did not work well were excluded accordingly. The lesson plans revised according to the feedback received from the validity committee as a part of the action plan process were later applied in the classrooms.

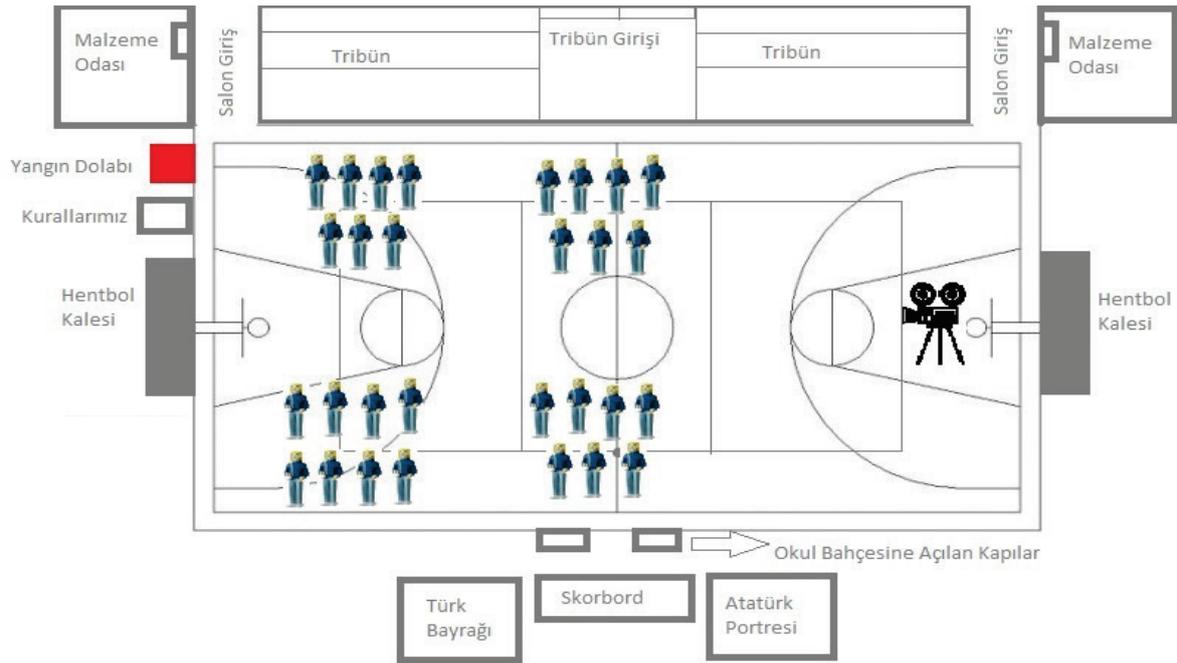
**Research Field:** The study was conducted in 5<sup>th</sup> grade physical training and sports lessons of a secondary school located in Eskişehir (a city in Turkey) during 2014-2015 academic year. The two-storey sports hall where the study was carried out is a 5-year-old building located in the garden of the school. The building is located to the left of the main building and just the opposite of the entrance to the garden. There is a great hall when you enter the building, and there are gyms and a table tennis room downstairs. You can enter the hall by climbing the stairs after you walk through a big iron gate. In the corridors to the left and right of the doorway are the lockers, teachers’ room and the room where the sports equipment is stored. There are the photographs of sportsmen on the walls near the stairs leading to downstairs. Just opposite these stairs is the table tennis room, and the gym is located to the left of the stairs. This research environment is given in Picture 1, Picture 2 and Picture 3.



Picture 1. Research Sport Hall



Picture 2. Pre-Research Hall



**Picture 3.** Research Environment

**Participants:** The participants of the study are 5<sup>th</sup> grade students attending a secondary school. The researcher worked with this group of students throughout the study. The students participated in the study on a voluntary basis, so their parents were asked to sign two forms to get their written permission at the beginning of the semester: a consent form and voluntary participation form.

**Students:** 5<sup>th</sup> grade students of a secondary school participated in the study. No students were included or excluded from the study throughout the application. The number of the students was 29. The data were collected from all these 29 students, but 8 focus students determined during the implementation were focused on more. One of these 29 students was not able to attend the lessons for the last three weeks because of her illness, but she regularly kept diaries for the lessons she attended. Therefore, the researcher used this data for the analysis as well. 8 focus students were determined according to the following criteria: two students who were interested in the lessons (based on the opinions of the main teacher); two students who were not interested in the lessons (based on the observations by the researcher); two students who are the members of a school team; and two students who are not the members of any school team. The nicknames were used for focus students instead of their real names for the sake of research ethics principles.

**The Researcher:** Researcher is the most important component in an action research. In this study, the researcher attended – as a guest student- the course called Action Research (BTÖ 618) offered at Anadolu University Educational Sciences Institute while writing her PhD dissertation. Thus, she decided to use action research method thinking that she gained enough experience and knowledge necessary to carry out a study based on action research principles. Prior to the application, the researcher observed a number of classes; at least for two weeks in each class. Thanks to these observations, the students got used to her presence, and they were given information about the study.

**Validity Committee:** Validity committee consists of experts who are expected to guide the researcher during a study and provide constructive criticism when necessary. In action research, it is essential that these experts monitor the data collection process and examine the data collected to ensure

validity and reliability. In these committee meetings, the members help the researcher organize the study by expressing and exchanging their opinions (Hubbard & Power, 1993, as cited in Cavkaytar, 2009). Thus, it is critical to form validity committees in action research to guide the researcher. In this study, the validity committee consisted of two instructors:

- an academician from the Faculty of Sports Sciences who teaches at graduate level,
- another academician from Open Education Faculty who is an expert in his field and teaches to PhD students.

They checked the plans prepared by the researcher, watched the video recordings of the application, identified the problems and suggested some possible solutions to these problems.

A total of seven validity committee meetings were held; usually once in two weeks in Open Education Faculty and the Faculty of Sports Sciences. The researcher presented the video recordings of the lessons, the plans for the next lesson and activity plans to the committee members during the meetings. In addition, she sent the macro transcripts (in summary format) of the video recordings to the experts in the committee via e-mail. The problems faced during the application and alternative plans were discussed in these meetings. Possible solutions were applied when necessary, and the following weeks were planned based on the decisions taken during the meetings.

**Data Collection Tools:** The study used video recordings, observation, researcher's and learners' diaries and semi-structured interviews in order to collect qualitative data. "Physical Training Lesson Attitude Scale", which was developed by Pehlivan (1998), was used to collect quantitative data. This 5-point Likert scale consists of 22 items, and its reliability coefficient was found to be .94.

**Validity, Reliability and Ethics:** Different strategies are suggested in qualitative studies so that the collected data verifies the findings to guarantee validity and reliability (Johnson, 2002; Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005; Creswell, 2008; Cohen & Crabtree, 2008). The strategies applied in this study to ensure validity and reliability are as follows:

- The researcher observed the whole lessons for 2 weeks in order to determine the focus area in the learning environment prior to the implementation. She recorded these observations regularly in a reflective journal. Later, they were transcribed and the transcripts were checked for accuracy by three experts in field.
- Both qualitative and quantitative data were collected for the purposes of the study to ensure rich data variety. In other words, the researcher searched answers to the research questions by using different data resources.
- The lessons were video recorded throughout the implementation phase. Also, the interviews conducted with the teacher and the students as well as all validity meetings were audio recorded. These recording were later transcribed at macro level to develop action plans throughout the research process.
- The audio recordings of validity committee meetings were also transcribed and the accuracy of the decisions made were approved by committee members accordingly.
- In order to test the accuracy of the transcribed data, the data obtained from video and audio recordings were given to three experts in the field, who watched and listened to them to approve their accuracy. Some missing transitions such as "and, or etc" as well as some missing words were added to the transcripts during the control process.

**In order to ensure of the data, both positive and negative examples were provided while presenting the findings.**

- The findings of the study were compared to those of similar studies in the literature within a theoretical framework.

- The researcher regularly wrote about her reflections of the research process in the reflective journals
- Video recording were shared with validity committee members to get their opinions and suggestions. The committee meeting were audio recorded, transcribed following the meetings and sent to the experts via e-mail.

Research ethics was carefully taken into consideration in this study. First, the researcher talked to the administrators and physical training and sports teachers of the school where the study would be conducted. After getting their permission, the researcher applied to the “Ethical Committee” to get the approval for the data collection tools. The report submitted to the committee described the research process and procedures in detail. The data collection tools to be used, parental permission forms and voluntary participation forms were also presented to the committee. Ethical Committee approved the research after completing its evaluation process. Later, the researcher initiated the research process by applying the Ministry of Education to get necessary permissions as suggested by the Ethical Committee. The participation to the study was on a voluntary basis. Research ethics requires honesty towards participants. Thus, the students in the classroom were informed about the aim, scope and significance of the study. Similarly, the parents were also given information about the study during the teacher-parent meeting, and the interested parents were asked to sign “parental permission form” so that their children could participate in the study. For data analysis purposes, the codes were used for each participant instead of real names.

#### *Data Analysis*

Both qualitative and quantitative data collection tools were used in this study. Thus, they were analyzed with the help of different methods.

#### *Analysis of Quantitative Data*

The researcher administered “Physical Training and Sports Attitude Scale” as pre and post-test (prior to and after the application) in order to investigate how the implementation of “differentiated instruction approach” affects students’ attitudes towards the lesson. The data obtained from this scale was analyzed by using SPSS 22.0 package software. Due to low number of sampling, Shapiro-Wilks normality test was applied and the data did not show normal distribution, Wilcoxon test, which is a non-parametric test, was applied.

#### *Analysis of Qualitative Data*

The analysis of the qualitative data obtained in this study was done by following the analysis steps mentioned below (Cavkaytar, 2009).

***Transcription of the data:*** In this step, video recordings were transcribed in the form of course flow chart; the interviews with the teacher and students as interview form; and researcher’s diary and learners’ diaries as narratives. All these transcripts have regularly been filed by the researcher.

***Organizing the data for analysis:*** Regularly logged in different forms, the data was filed on a weekly basis. When all the recordings were transcribed, the data obtained were randomly given to three experts in the field. These experts checked the data for consistency and whether the data were transcribed correctly or not. They also made some basic corrections such as some missing transitions and words.

***Rechecking all the data:*** In this step, all video recordings were watched again, and the transcribed data were checked by the researcher once more. This rechecking facilitated the coding procedures to a great extent.

***Data coding:*** In this step, all the data from the checked and verified transcripts of video recordings and all other data collection tools were coded after they were made meaningful for the analysis.

**Coding the data to coding keys:** In this step, the data were coded by the researcher. Later, these data were coded again by another expert and they agreed on the themes determined.

**Comparison and verification of the data:** In this step, the reliability of data was calculated according to Miles and Huberman's (1994 as cited in Cavkaytar, 2009) "consensus" and "dissidence" formula:

$$\text{Reliability} = \text{Consensus} / (\text{consensus} + \text{dissidence}) \times 100$$

In the literature, it is generally agreed that data is considered reliable when the calculated value is at least 70%. In this study, this value was found to be 87%.

## Results

In this action research, the data obtained from both qualitative and quantitative data collection tools were interpreted on the basis of research questions. The findings of this study were examined under three subtitles: the findings obtained during identify and describe problem phase (prior to the implementation); those obtained during the implementation; and other findings obtained during the implementation process.

**Table 2.** Participation of Physical Education Lesson Attitude Scale Pre-Test and Post-Test Scores of Participants

Tests	N	X	Ss	z	p
Pre-Test	29	84,93	15,107		
Post test	29	99,48	5,902	-3,906	,001

\*p < 0.05

Table 2 shows that the participant students' mean pre-test score for their attitudes towards physical training and sport course is 84,93 and standard deviation 15.107, and the post-test mean score is 99,48 and standard deviation 5.902. The findings revealed a 15 points increase between the pre-test and post test scores obtained from "Physical Training and Sports Course Attitude Scale". The p value calculated at 0.05 significance level showed a statistically significant difference. According to this finding, it can be concluded that the implementation of "Differentiated Instruction Approach" in physical training and sports course have positive effects on students' attitudes towards this course.

**The findings obtained during identifying and describing problem phase (prior to the application):** These findings are classified as follows: the findings from the interviews with the teacher; the findings regarding how the lesson is covered; the findings regarding the importance of individual differences; and the findings regarding social interaction. The data obtained from observations and the interviews with the teacher revealed that individual differences were ignored and students did not participate in the lessons effectively. The following excerpts from the diaries reflect these findings:

**The researcher:** *What do you do to take individual differences of your students into consideration in physical education and sports lessons?*

**The teacher:** *When we covered the topics in the curriculum, we design activities by dividing students into different groups.*

**The Researcher:** *So you give them some free time so that they can play basketball.*

**The Teacher:** *This is a reality (of these lessons) across the country*

When we look into the findings regarding how the lessons were given, the observations revealed that traditional methods were employed rather than different teaching approaches. This finding was reflected in the researcher's diary as follows: *"In today's lesson, the students were first asked to line up according to their height. Later, they were asked to make a warm-up run in pairs. It was quite clear that the students were not happy with this warm-up run and their faces reflected their boredom. When the warm-up run ended, one of the outgoing students moved into the middle. Here, the teacher could have allowed a more silent and introvert student take this position. After the warm-up moves, the students were divided into two groups in pairs. The students jumped over hurdles and ran among the slalom poles. Some of the students went to the back of the line when it was their turn because they did not want to do this task. There was a not a certain order and planning in the lesson. It was clear that the students were happy only when they were free during the lesson."*

As for the findings regarding the importance of individual differences, the researcher carried out observations prior to the implementation to find out whether an approach which take individual differences into consideration is used or not, and how the lessons are reorganized according to these differences when such an approach is integrated into the teaching process. The observations revealed that the individual differences were often ignored and this finding was reflected in researcher's diary as follows: *"Today, some students did not participate in the lesson. When others finished warm-up run, two randomly selected students stood in the middle and made other students do the warm-up exercises. Later, the students were divided into two groups and jumped over the hurdles, which were not chosen and placed according to the students' individual differences. While some students jumped over them easily, others either knocked down the hurdles or were not be able to jump over them. If there had been hurdles at different lengths, students would have performed according to their levels and none of them would have gotten bored"*.

The data regarding social interaction revealed an ineffective social interaction among the students. The researcher wrote about this finding in her dairy as follows: *"Since there was no variety in teaching practice, the students were divided into groups either as "girl vs.-boys or "students were counted and divided into two according to odd and even numbers" . As I observed, close friends preferred to perform the tasks together. The same also happened when the teacher gave them free time. Close friends played together, they even did not allow others to join the group. The isolated students watched others play. It would be better if the teacher sometimes continues to do the lesson in groups of 3-4 and sometimes gives free time."*

**The findings obtained during the implementation:** This study aimed to investigate whether differentiated instruction approach can be implemented in physical training and sports lesson and tried to find answers to the following research questions: "How can Differentiated Instruction Approach be implemented in 5<sup>th</sup> grade Physical Training and Sports lessons?", "What are the opinions of students regarding the integration of Differentiated Instruction Approach into Physical Training and Sports lessons?" and "How does a teaching process planned and designed according to the principles of differentiated instruction approach affect students' attitude towards physical training and sports lessons?". In this respect, the findings obtained from the application were examined under the following subtitles: the findings regarding social interaction, the findings regarding the assessment procedures, and the findings regarding the opinions of students about the lessons structured according to the principles of differentiated instruction approach (they were examined as two different themes: the lesson outcomes and the activities in the groups").

**The findings obtained regarding the use of differentiated instruction in Physical Training and Sports lessons:** "Centers" and "Stations" strategies of Differentiated Instruction Approach were used in this study. The researcher planned the lessons according to these strategies. It was observed that differentiating the teaching process by taking individual differences into account play an important role in active participation of students in the lessons. Also, the students enjoyed whole class activities and demanded "free time" less and less. This situation was reflected in learners' diaries as follows:

*(Ahmet, 12.03.2015), "Today, I enjoyed Physical Training lesson very much. I had fun playing volleyball although I don't know about it very much, I felt happy"*

(Tuana, 12.03.2015): *"Today, we learned volleyball. The lesson was lot of fun. Especially, it was fun to carry the ball on our fingers. Our teacher is a very good person, I am very glad for that. The lesson was really fun. I wish it had lasted longer. Two-hour lesson was too short but it is a very enjoyable lesson. I am happy to attend in this school"*.

(Doğukan, 12.03.2015) *"Today, we played volleyball in Physical Training and Sports lesson. It is one of my favorite sports branches. Although, I like it, I (realized that) forgot some of the rules. It was a very enjoyable lesson. I had lots of fun. Unfortunately, it was only a two-hour lesson. Although I was sorry when the lesson ended, I was happy too because the lesson was enjoyable."*

(Merve, 12.03.2015). *Today's lesson was very enjoyable. We learned overhead pass in volleyball. It was lots of fun. We were divided into teams. I was in red team. Of course overhead pass in volleyball. Our teacher is also great. I was bored during free times. That is better. I am sure we will learn many games in the future. I am enjoying physical training lessons more and more.*

(Salim, 12.03.2015). *Today, we learned how to play volleyball from Feray teacher. I thought that there is only football as a sport branch but when we had the lesson with Feray teacher I learned that there are other sports branches as well. I will be interested in other branches as well.*

(Semih, 12.03.2015) *Today, we could have played a volleyball match. But I had fun anyway. If we played ourselves, it would be better. I hope it happens one day. We could have played volleyball match in the lesson.*

A student who did not participate in the lesson because of her illness but watched the lesson from the stands wrote in her journal as follows: *"Today, they did enjoyable activities in the lesson. I am sorry not being able to participate. I am getting bored"*. The students had always demanded free time in these lessons since the beginning of the semester. However, there was less and less demand for free times, and they were observed to enjoy the lesson. This finding might depend on how the lesson is presented. Some of the opinions of students regarding the activities are as follows:

(Tuana, 02.04.2015) *The lesson was incredibly fun today. Especially parachute was quite fun. We are a very lucky class. Only we are having fun in the school. I wish the lesson were longer. It is more fun when we are in a group together with our favorite friends. I wish we played parachute next week, too"*.

(Bayram, 02.04.2015). *Today, I had too much fun. We learned "forearm pass" and it was great. Towards the end of the lesson, we played a game with a parachute. We put balls in the parachute and threw them away. We tried to pass through it and everybody did.*

(Hüseyin, 02.04.2015). *"Today, we learned "forearm pass". I think I am getting better and better. Later, we threw balls with a parachute and tried to catch them. Later, we tried to pass under the parachute. I had a lot of fun."*

(Merve, 02.04.2015). *"Today, I had a lot of fun. We played parachute game. It was a very nice game. We learned "forearm pass" as well. We were divided into groups. I started to like this lesson more and more. I realized that having free time is very boring. Students get injured by hitting each other (while running). Everybody feels painful."*

Salim, 02.94.2015). *"Dear diary, today we had a lot of fun. It was one of my best days."*

**The findings related to Social Interaction:** The researcher asked students to work in different groups throughout the implementation and observed that they gradually learned to share and help each other. Almost all students reported that they learned to work with others willingly; even with the ones they were once angry with. Some students said: *"We socialized better during the lessons; we learned not to laugh at each other; we used to divide into groups as boys and girls, but now we socialize better"*. Similarly, one student said: *"The boys simply used to play football by themselves and we, the girls, dodgeball. Now, we played together with boys"*. Another student with a similar idea said: *"Everybody worked together; there was no discrimination between boys and girls"*. Still another student reported: *"We socialized better. We did not use to get on well with some boys; Now, we have better relationships"*. The comments on the lessons clearly reveal that the lessons during the implementation process might have positive effects on the socialization among students.

**The findings regarding the assessment of the students:** During measurement and assessment week, the researcher assessed each student one by one according to the form prepared after the activities. The researcher was critical of this assessment method and reflected this criticism in her reflective journal as follows: *"I believe that assessing students individually one by one or when they are asked to perform in pairs can be boring and stressful. I did the assessment like this this time, but I believe that it will be better to use a different method next time."* (YG, 09.04.2015). In the following measurement and assessment week, the researcher gave information about the content of the lesson at the beginning of the lesson as usual. Since the warmups would be performed in the stations and it was measurement and assessment week, the researcher said that there would be some assessments while they were performing the moves, and she would take some notes as well. After the assessment, the researcher gave introductory information about football, so the lesson flowed smoothly. The researcher planned this assessment procedure in a different way than the previous one. The students were assessed while they were performing. This practice was reflected in researcher's reflective journal as follows: *"I formed four stations for warmups and assessment. The students carried out different activities related to handball in each station and they changed these stations after certain intervals. I assessed them by walking among them and observing. I believe that such an assessment procedure is more useful both for me and the students. Normally, we used to assess the students one by one or in pairs, which often caused stress for students. However, this time, I assessed the students according to the criteria I prepared in advance by taking their levels into consideration. Also, the students continued to do their work without realizing that they are being assessed. In the previous method, other students had to wait while two students are being assessed or had to fill in a form etc, if there was one. Everybody was active in this assessment procedures, and they continued to carry out their activities (YG, 21.05.2015)."*

The researcher shared the video recording of this differentiated assessment practice with the validity committee members in the next meeting. The members liked this practice and stated that the students did not experience any test anxiety and were not passive during the lesson (GTT, 22.05.2015). Some opinions regarding this assessment method are stated in learner's diaries as follows:

(Tuana, 21.05.2015). *"Today, we learned about handball again. It was fun. I think that I have progressed a lot in handball. Because I was not able to hold the ball with one hand at the beginning but now I can play with my two hands. We also made a short introduction to football. We learned "instep" kick. It was very enjoyable"*

(Merve, 21.05.2015). *Today' we reviewed what we learned about handball yesterday. We made an introduction to football. We learned about "instep" kick. I had some difficulties and tried to do the moves. I suddenly thought: "Can I hit the ball to the goal when I learned how to play football?"*

(Sıla, 21.05.2015). *I had too much fun today. We talked about handball a bit and football terms. Feray teacher observed us and gave us some scores. I think she gave me 100 points. In short, I had so much fun today.*

*When all these comments are considered, we can state that differentiated assessment have had positive effects on both students and the teacher.*

**The opinions of students regarding physical training and sports lessons which were structured according to differentiated instruction method:** The data regarding the course objectives and the activities carried out in groups were obtained within the scope of the study. When these findings are examined, it can be concluded that application process was quite productive and course objectives were achieved. Some opinions about this issue can be listed as follows:

Student 1: *"I believe that I learn more when we do Physical Training lessons together. Because we used to have free times in this lesson but now we learned how to play volleyball, handball and football. Also we socialized with our classmates better, we learned not to make fun of each other."*

Student 2: *"It was nice, I think. We learned new things. We learned about volleyball, football and handball."*

Student 3: *"It was better since we did everything together. So, we acted together, not one by one."*

Student 8: *"I can tell you the followings about our lessons. They were fun. I used to get bored in previous Physical Training lessons because our teacher always used to let us have free times. And I did not have any knowledge about sports branches but I learned a lot from you. I started to like these sports branches. So they went well."*

*Student 7: "I used to play table tennis in the past. I used to know only about table tennis. But now I know about volleyball, handball and football. We used to have free times in the previous lessons and did not used to have any place to play in since boys used to play football."*

*Student 4: "It was fun, we learned about some other sports branches."*

*Student 5: "We used to have free times in the previous lesson and do nothing. The boys used to play football themselves and we, the girls, used to play dodgeball. In your lessons, we played together with boys. They did the things they didn't like and we did the things we didn't like but the sports were fun, we learned something. At the beginning of the semester, the students were not good at sports, later they started to play better and better gradually."*

When we examined the findings related to the activities carried out in the groups, we can conclude that physical training and sports lessons structured according to the principles of differentiated instruction approach were productive for the students and helped them to socialize. Also, the time was managed more effectively and lesson objectives were achieved. Some opinions stated by the students about these findings are as follows:

*Student 6: "For example, we played together with the friends we were angry with, we made peace with them. I learned the topics better. Luckily, we were made into groups. Because it could have been worse if we had studied alone, not in the groups. I think it was better when we were in a group with our friends."*

*Student 3: "We did not waste any time. Also, we acted together. Previously, we used to have whole class activities. Everybody used to carry out different activities. The boys used to play together and the girls together in different activities."*

*Student 5: "We were in smaller groups since everybody worked in different groups. We had quicker turns. If we had done the same activity as a class, we would have had longer turns."*

*Student 4: "Everybody worked together, no distinction between boys and girls. We did not waste any time."*

*Student 7: "We socialized better. We did not used to have good relationships with boys. Now, we have better relationships. We learned the moves more quickly. Everybody learned these moves."*

**Other findings obtained during the implementation:** Among the findings obtained in this category are lesson rules and awards, self-evaluation, participation in the lessons and contribution to the professional development of the researcher. It was generally observed that all the students obeyed the lesson rules. As for the self-evaluation, we can see that the students evaluated themselves quite objectively. Some of the statements in learners' diaries on these findings are as follows:

07.05.2015: One student said: *"Dear dairy, today we did activities related to football, it was a very fun day. I learned from you a lot about many sports branches and how to play them. I gained self-confidence".* Another student stated: *"Hello, dear diary. It was a very enjoyable day. Do you know? In fact, I love playing football, but I used to hesitate to tell this because I was afraid that my friends used to make fun of me."* The findings related to the participation in the lessons revealed that the implementation brought positive results. Assigning a task to a student who was not able to attend the lessons because of her illness positively affected her participation in the lessons. This situation was reflected in her dairy as follows: *"Today, it was fun. Even to hold the circle was satisfactory for me. I am very happy. The activities were great, but I want to participate."*

14.05.2015: *"Today, I joined (the lesson) and it was more fun than I expected. I love my teacher very much. I played handball and it was much fun."*

21.05.2015: *"I believe, the more I participate, the better time I have. Sitting down is boring, but physical training is fun. Handball is over but it was fun. I never played football but I learned "instep" pass. It is much fun."*

As for the contribution to the professional development of the researcher, it can be concluded that the application produced positive results in terms of classroom management and mastering in teaching.

## Discussion

According to the findings of this study, it was found that Differentiated Instruction Approach and the use of “learning centers”, which is one of “centers strategies”, resulted in more effective participation in the lessons, better time management and knowledge development. The literature review shows that these findings are consistent with those of other similar studies. For instance, Marinescu et al. (2014) conducted a study with 6<sup>th</sup> graders to support the development of mentally retarded students in physical training and sports lessons through some group activities structured according to the principles of differentiated instruction. They found that the students’ motor skills improved and motivation levels increased. Similarly, Mujea (2014) used differentiated instruction approach in physical training and sports lessons. She observed that the students with mental problems improved their motor skills and established more effective and dynamic relationships with their families, friends and teachers.

There are many studies in different fields of study which support these findings. Karadağ (2010), in his study on language teaching, found that forming learning centers improved many types of skills. Shepherd and Alpert (2015) conducted a study with hearing-impaired students by using differentiated instruction. They found that the students using new technologies participated in lessons more actively when compared to those attending traditional classrooms. They were also found to retain knowledge longer in their memory.

Another findings of the study is that thanks to the stations formed as part of the differentiated instruction approach, the students learned collaboratively in a group, respected each other and were aware of their responsibilities more and more. This finding is consistent with the finding of the action research conducted by Flaherty and Hackler (2010). In their study, the researchers used differentiated instruction approach to have collaborative learning groups. They found that this design played an important role in self-learning and group learning. The research findings also revealed that integrating some related games into the learning process were effective in consolidating the content. Trinter, Brighton, & Moon (2015), in their study, used differentiated game cards in mathematics lesson and found that it was an effective method while teaching new concepts. This finding is also consistent with that of the current study.

The study also revealed that differentiated assessment had positive effects for both the teacher and the students. This finding is well supported by the findings of the study by Maeng and Bell (2015), which suggests that planning the lessons by taking into consideration the learning profiles and readiness level of students contributes to their academic achievement.

The answers provided by the students reflect their opinions about differentiated instruction approach. Generally, the students reported that the lessons were useful for them and contributed to their learning. There are some studies supporting these findings. Dosch and Zidon (2014), in their studies focusing on high school students, asked some questions related to differentiated learning and found that the use of differentiated methods contributed to their learning in a positive way.

Under the light of the data obtained, it can be concluded that when physical training lessons were structured according to the principles of differentiated instruction approach, they were productive for the students, time was managed effectively, they helped students to socialize and course objectives were achieved. In addition, the students reported that they had more fun and learned more when compared to the previous physical training lessons. Similarly, Avcı et al. (2009) found that differentiated instruction positively contributed to students’ learning. Another study by Chien (2013) also suggests

that differentiated instruction was much fun for students. Still another study used differentiated instruction in music lessons and found positive effects on students (Darrow, 2015).

It was observed that the students were quite eager to attend the lessons. This process can be said to make students enjoy the lessons. The research was designed according to the principles of differentiated approach in a way to encourage all the students to participate in the lessons. The students also reported positive opinions about their participation as well. The finding “differentiated instruction approach has positive effects on students’ participation in lesson and their motivation” is also supported by Martin and Pickett’s (2013) study, in which they found that the use of differentiated instruction approach in mathematics and music lessons with 5<sup>th</sup> grade students caused a considerable increase in students’ motivation and participation in the lessons. The findings of the study by Erguvan (2014) also support this finding. Finally, Katzi, Tsolaki, Mavrotheris, & Koutselini (2013) found that differentiated instruction had positive effects on students’ learning and their attitude towards mathematics.

### **Conclusion**

When the findings of the study are examined, it was found out that differentiated instruction had not been implemented in these classrooms beforehand and individual differences had been ignored to a great extent. Since individual differences were taken into consideration in this study, it was observed that learners learned at their own paces, enjoyed activities more, studied simultaneously and asked for less and less free time in the lessons. In addition, simultaneous activities at the stations allowed the use of lesson time more efficiently, establish better relationships and socialize more effectively. Teaching and assessment are two indispensable components of learning process. Thus, this implementation emphasized assessment, and the use of alternative assessment methods helped the participants to be more enthusiastic about learning. Since the classroom rules were determined at the beginning of the course together with the students, they were observed to have obeyed these rules better. In general, the students participated in the lessons more actively since the method implemented allowed them to learn at their own paces. The study also contributed to the professional development of the researcher in terms of classroom management, lesson planning and exploitation of actual resources. The physical training and sport course designed based on the differentiated instruction approach was observed to have positive effects on students’ attitude towards this course. Thus, we can conclude that it is possible to implement differentiated instruction approach in physical training and sport lessons, and this approach is effective in increasing student participation in lessons and learning at their own paces.

### **Suggestions**

#### ***Recommendations Regarding the Implementation***

The following recommendations can be made regarding the actual implementation according to the findings obtained from the study:

- Differentiated instruction, which enables student to learn at their own pace, can be integrated into 5<sup>th</sup> grade Physical Training and Sports lessons.
- “Centers” and “Stations”, which are two of the strategies used by differentiated instruction, can be employed for the following purposes: to help students develop their team work skills; make them more active in the lessons; encourage them for more efficient participation in lessons; and make them more sociable.
- It is important that all the materials used in differentiated instruction approach implemented physical training and sport courses to serve for the intended purpose.

- Since Physical Training and Sports lessons relatively last shorter and are more dynamic. However, taking off school uniforms and wearing sportswear take some time off the lesson duration. Increasing the duration of the lessons can be a solution to this time limitation.
- Other teachers can be trained in collaboration with the Ministry of Education for the implementation of differentiated instruction in physical training and sports lessons

#### *Recommendations for Further Research*

- The studies focusing on the implementation of differentiated instruction approach might be replicated for different courses
- The studies focusing on the implementation of differentiated instruction approach might be replicated at different levels of education.
- Differentiated instruction approach can be investigated in different departments of Faculties of Sports Sciences or Schools of Physical Trainings and Sports as well as in different fields of studies
- Other strategies used in the approach can also be examined.
- Students' knowledge development in sports can also be examined.

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