EFFECTIVENESS OF A DATA-BASED DECISION-MAKING PROFESSIONAL LEARNING COMMUNITY FOR PHYSICAL EDUCATION TEACHERS AND ITS IMPACT ON STUDENTS' KNOWLEDGE AND PHYSICAL ACTIVITY LEVEL

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ABSTRACT

EFFECTIVENESS OF A DATA-BASED DECISION-MAKING PROFESSIONAL LEARNING COMMUNITY FOR PHYSICAL EDUCATION TEACHERS AND ITS IMPACT ON STUDENTS' KNOWLEDGE AND PHYSICAL ACTIVITY LEVEL

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The purpose of this study was two-fold; (1) to design a data-based decision-making professional development (DBDM-PD) program for secondary school physical education teachers and (2) to examine the effects of this program on teachers' data use and instructional practices and their students' learning. The study includes a needs analysis on the designing of this program in the form of the professional learning community (PLC), its implementation with a theoretical framework behind the design, and an evaluation of the program's effectiveness by comprehensively examining teachers' satisfaction, professional learning outcomes, transfer of learning to instruction and their students' learning. The participants were 12 teachers (six in the experimental group and six in the control group) and their 331 seventh-grade students. A mixed method with a between-groups experimental design was used in this study. While qualitative data were gathered through semi-structured interviews with teachers, observations, field notes, and video recordings of PLC meetings, quantitative data were collected via the "Health Related Fitness Knowledge Test" and "The Physical

Activity Questionnaire." According to the findings of constant comparison analysis, participating in the DBDM-PD program improved awareness of data use in teaching and the professional knowledge and skills of teachers; in addition, this improvement has been reflected in their instructional practices regarding health-related knowledge (HrF) and physical activity. Mixed between-within-subject ANOVA results showed that experimental group students' HrF knowledge level and physical activity level increased significantly compared to the control group ($p < .05$). It is recommended to disseminate DBDM-PD programs for physical education teachers.

Keywords: Data-Based Decision-Making, Professional Learning Community, Professional Development Program, Physical Education

ÖZ

BEDEN EĞİTİMİ ÖĞRETMENLERİ İÇİN VERİYE DAYALI KARAR VERME MESLEKİ ÖĞRENME TOPLULUĞUNUN ETKİLİLİĞİ VE ÖĞRENCİLERİN BİLGİ VE FİZİKSEL AKTİVİTE DÜZEYLERİNE ETKİSİ

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Bu çalışmanın amacı (1) ortaokul beden eğitimi öğretmenleri için bir veriye dayalı karar verme mesleki gelişim (VDKV-MG) programı tasarlamak ve (2) bu programın öğretmenlerin veri kullanımı, öğretim uygulamaları ve öğrencilerinin öğrenmeleri üzerindeki etkilerini incelemektir. Çalışma, bu programın mesleki gelişim topluluğu (MGT) şeklinde tasarlanmasına ilişkin bir ihtiyaç analizini, tasarımın arkasındaki teorik çerçeveyle birlikte uygulanmasını ve öğretmenlerin memnuniyetini, mesleki öğrenme çıktılarını, öğrendiklerini öğretime aktarmalarını ve öğrencilerinin öğrenmelerini kapsamlı bir şekilde inceleyerek programın etkililiğinin değerlendirilmesini içermektedir. Katılımcılar 12 öğretmen (altı deney grubu ve altı kontrol grubu) ve onların 331 yedinci sınıf öğrencisinden oluşmaktadır. Bu çalışmada gruplar arası deneysel desene sahip karma bir yöntem kullanılmıştır. Nitel veriler öğretmenlerle yapılan yarı yapılandırılmış görüşmeler, gözlemler, alan notları ve MGT toplantılarının video kayıtları aracılığıyla toplanırken, nicel veriler ise "Sağlıkla İlgili Fiziksel Uygunluk Bilgi Testi" ve "Fiziksel Aktivite Anketi" aracılığıyla toplanmıştır. Sürekli karşılaştırma analizi bulgularına göre, VDKV-MG programına

katılmak, öğretmenlerin öğretimde veri kullanımına ilişkin farkındalıklarını ve mesleki bilgi ve becerilerini geliştirmiş; ayrıca bu gelişme, sağlıkla ilgili fiziksel uygunluk (SiFU) bilgisi ve fiziksel aktiviteye ilişkin öğretim uygulamalarına da yansımıştır. Karışık ölçümler için iki yönlü varyans analizi sonuçları, deney grubu öğrencilerinin SiFU bilgi düzeyi ve fiziksel aktivite düzeyinin kontrol grubuna kıyasla anlamlı şekilde arttığını göstermiştir. Beden eğitimi öğretmenleri için VDKV-MG programlarının yaygınlaştırılması önerilir.

Anahtar Kelimeler: Veriye Dayalı Karar Verme, Mesleki Gelişim Topluluğu, Mesleki Gelişim Programı, Beden Eğitimi

To Asel and Adem

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

DBDM	Data-Based Decision-Making
HrF	Health Related Fitness
MoNE	Ministry of National Education
MoNH	Ministry of National Health
PAQ-C	Physical Activity Questionnaire for Older Children
PD	Professional Development
PLC	Professional Learning Community

CHAPTER 1

INTRODUCTION

This chapter contains background of the study, statement of the problem, research questions, significance of the study, and definitions of the terms.

1.1. Background of the Study

Data is defined in the context of education as "*information that is collected and organized to represent some aspect of schools*" (Lai & Schildkamp, 2013). This definition challenges the some already-available conceptions and understanding of "data" in the school setting. Hamilton et al. (2009) discussed that data has been characterized rather limited as test data in some school settings, especially as quantifiable standardized assessments or national test results. Yet, this understanding is quite incomplete because data includes any kinds of qualitative or quantitative data collected structurally related to functioning of the school, such as input data (e.g., student background data), process data (e.g., classroom observations and teacher interviews), context data (e.g., information about the building), and output data (e.g., student achievement data) (Ikemoto & Marsh, 2007). Considering this perspective, there is a growing body of research providing evidence that quality data and using it to foster student learning is essential for effective teaching and quality school leadership (Lai & Schildkamp, 2013).

There have been several concepts referring to using data to inform decision-making as "data use," "data-based decision-making" (Carlson et al., 2011; Lai & Schildkamp, 2013), "data-informed decision-making" (Shen & Cooley, 2008), or "data-driven decision-making" (Mandinach, 2012). In this study, data-based decision-making

(DBDM) refers to the systematic collection, analysis, examination, and interpretation of data to inform practice and policy in educational settings (Mandinach, 2012).

As suggested by Coburn and Turner (2011), data use involves the entire process of data collection, analysis, and interpretation which finally leads to using the obtained information as a basis for decisions about adapting the educational practices and then evaluating whether they have addressed the desired outcomes accordingly or not. Lai and Schildkamp (2013) have explained the data use process as follows; transforming data into information starts with a clear/understandable purpose addressing the questions of what data is needed and why. The data collector should have a question that the collected data will help to answer. Without a clear purpose, collecting plenty of data that is not useful for decision-making can waste time and resources. When there is a clear purpose, it is quite straightforward to decide what data should be collected from possible data sources. Then, analyzing the data involves contextualizing, categorizing, calculating, connecting, and summarizing the data in a way that serves the intended purpose (Davenport & Prusak, 1998). The next step is to interpret the data. Interpretation is understanding what the data means and its implications for future action (Lai & Schildkamp, 2013). Interpreting data may sometimes result in the need to collect and analyze more data. Only when the conclusion from the data is clear, the suitable action can be taken based on the data (Schildkamp & Poortman, 2015).

DBDM is more than just a system for accountability in educational settings, it is a learner-centered teaching tool at the classroom level. It supports differentiated instruction by supplying teachers with information to assist them tailor their teaching to classroom and students' individual learning needs (Rallis & Macmullen, 2000). DBDM can foster student achievement by addressing the gap between students' present learning and the desired learning outcomes of the curriculum (Lai et al., 2014; van Geel et al., 2016). While the contributions of DBDM to students' learning have been repeatedly discussed in the literature (Carlson et al., 2011; Gelderblom et al., 2016; McNaughton et al., 2012; Poortman & Schildkamp, 2016), some findings indicate that schools still struggle to implement DBDM effectively (Mandinach & Gummer, 2013; Marsh, 2012). Schildkamp and Poortman (2015) asserted that

educators' data literacy is the underlying critical reason for this difficulty of using data effectively in schools.

Data literacy refers to educators' ability for implementing DBDM and can be explained as ability of educators to set a purpose, collect, analyze, and interpret data, and take instructional action (Hamilton et al., 2009; Mandinach & Gummer, 2016; van Geel et al., 2016). Data literacy involves specific knowledge and skills which are supposed to be essential for data use effectively in education (van Geel et al., 2017). For instance, Mandinach et al. (2006) argued that transforming data into knowledge seems quite essential for educators. Thus, several skills, such as collecting and organizing data, analyzing and summarizing data, and synthesizing and prioritizing data, are needed to this transformation. Mandinach (2012) broadened this perspective on data literacy concerning the knowledge and skills necessary for data interpretation and use. This expanded definition involves transforming raw information, such as number, results of analysis and statistics into instructional strategies that address the students' needs and lead to the desired outcomes.

Data-based decisions can be categorized under the three main purposes by accountability, school development and instruction (Schildkamp et al., 2017). Data use for accountability speaks of using data in external reports by the school administration, for instance, to provide accountable and quality information to inspectors regarding the school management and performance (Wohlstetter et al., 2008; Young, 2006). However, as discussed by Schildkamp et al. (2017), DBDM in educational settings has obtained increasing significance with respect to several points, such as making decisions on from school development to classroom and instructional concerns. Data use for school development can be explained as using data to evaluate and change the curriculum (Anderson et al., 2010; Brunner et al., 2005), to set the annual objectives for school improvement, and to decide efficient teaching methods (Breiter & Light, 2006; Wayman & Stringfield, 2006; Wohlstetter et al., 2008).

Data can also be used for instructional purposes which is the main focus of this study. Teachers can use the data for setting learning objectives for students, determining which topics and skills students have grasped or not, assessing students' progress over

time, adapting instruction according to individual students' needs, adjusting the pace of lessons, give students required feedback to foster their learning process, creating smaller students groups for targeted instruction, determining the instructional content to deliver in the class, recognize and define the reasons of students' mistakes, and tailoring instruction considering the needs of both gifted and special needs students (Schildkamp & Kuiper, 2010; Schildkamp et al, 2013; Wohlstetter et al., 2008; Young, 2006). With such a perspective, data use can be considered a valuable way to provide essential indicators to teachers regarding students' needs and to adapt and adjust their instruction accordingly (Keuning & van Geel, 2016).

A number of studies also show that factors involving school organizational characteristics data characteristics, and user characteristics affect teachers' effective data use (Hoogland et al., 2016; Schildkamp et al. 2017; Schildkamp & Poortman, 2015). The organisational structure of a school can influence what data and for which purposes are used in a school. For example, a school principal can prioritise data use practices and communicate expectations about these practices to other stakeholders in the school (Schildkamp & Kuiper, 2010). In addition, principals can procure that educators in a school have access to a reliable data system (Kerr et al., 2006; Wayman et al., 2012; Wayman & Jimerson, 2014). It also seems very important to have a common vision in the organization and to have measurable objectives at school, class and student levels. It is challenging to use data when there are no clear objectives since there are no benchmarks against which to compare the data (Datnow et al., 2007; Kerr et al., 2006; Wohlstetter et al., 2008).

Data characteristics and data systems can affect the uses of data for accountability, school development, and instructional purposes (Schildkamp & Poortman, 2015). Schools with efficient information management systems with access to current, accurate, and reliable data are more likely to use data more frequently (Breiter & Light, 2006; Coburn & Turner, 2011; Hoogland et al., 2016; Reeves et al., 2016).

Furthermore, the data user characteristics have a big impact on how data is used (Schildkamp & Poortman, 2015). School staff consist of individual people. Data literacy is an important topic that is covered in many research (Mandinach, 2012). To

analyze, interpret, and act on data requires certain knowledge and abilities. As a result, it is crucial to consider aspects at the level of specific data users (Jimerson & Wayman, 2012; Little, 2012; Wohlstetter et al., 2008).

Many studies have discussed the benefits of using data to make decisions in terms of deciding and adjusting instruction to ensure obtained desired learning outcomes by students (Ansyari et al., 2020; Carlson et al., 2011; Lai & McNaughton, 2016; McNaughton et al., 2012; Poortman & Schildkamp, 2016). However, as argued by Mandinach and Gummer (2013), data use is not included in teacher training curricula, and there seems to be a consensus on the need for support on data literacy and how to use it effectively for proper decision-making by teachers (Ince et al., 2020; Schildkamp & Kuiper, 2010). The importance of data literacy, how to use data effectively, and the clear need for support on the aforementioned concepts have been discussed in the relevant literature consistently (Hamilton et al., 2009; Kerr et al., 2006; Mandinach, 2012).

Several calls for quality and sustainable professional development opportunities have been made to support data literacy and use (Ince et al., 2020; Mandinach et al., 2006; Means et al., 2010). Such professional development programs mainly concentrate on advancing teachers' knowledge, skills, and attitudes toward data use. However, the underlying purpose has always been to advance instruction and foster student learning and achievement (Reeves & Honig, 2015; Schildkamp & Kuiper, 2010). The effects of such professional development programs aiming to improve teachers' data use have been investigated in several studies, and the focus on student achievement has been highlighted in the relevant literature (Lai & McNaughton, 2016; Poortman & Schildkamp, 2016; van Geel et al., 2016). Timperley et al. (2007) discussed that professional development programs could be quite successful in fostering student learning and achievement if the teachers and school administrators collect data to monitor their students in terms of their improvements and/or needs and also to test the effectiveness and/or appropriateness of their practices and use all data accordingly in their classrooms and schools.

Professional development is significant in improving data use skills (Marsh, 2012), and Lomos et al. (2011) have argued that a professional learning community helps improve such skills. A professional learning community (PLC) consists of teachers focusing on collaborative learning by sharing experiences and reflections, supporting the view that several studies are pointing out the supportive side of teacher collaboration to improve teacher and student learning (Borko, 2004; Stoll et al., 2006; Vescio et al., 2008).

The PLC is considered supportive by many scholars working on this subject and used as an effective tool in the professional development of teachers (Hunuk et al., 2013; Parker et al., 2010; Tannehill et al., 2021; Wenger, 1998). In order to ensure such perspective and quality professional development, learning communities consisting of a smaller number of group members and fostering learning with and from each other seem way better compared to the traditional learning approaches which refer to one-time meetings on specific issues with so many people and not supportive in terms of discussions and learning with and from each other (Hunuk et al., 2013; Patton et al., 2013; Tannehill et al., 2021). According to studies, a PLC needs the following qualities to be more successful: a shared objective, a concentration on student learning, collaboration among teachers, reflective inquiry, analysis and interpretation of data (Lomos et al., 2011; Vescio et al., 2008; Desimone, 2011).

1.2. Statement of the Problem

There is a growing interest and awareness that the use of data can improve the quality of education (OECD, 2013). However, research shows that most teachers and administrators do not use data effectively in schools (Schildkamp et al., 2009; Wohlstetter et al., 2008). In addition, teacher education bodies pay little attention to knowledge and skills concerning data use (Mandinach et al., 2015). Mars (2012) argued that in-service teachers mostly lack the skills and knowledge to use data efficiently.

In a project for physical education teachers in Turkey, which was structured using a large-scale PLC (Ince et al., 2020; TÜBİTAK Project No: 215K460), measurement

and evaluation are among the subjects in which teachers feel the least competent according to the proficiency findings specific to the field of physical education. In current physical education and sports programs, the development of students' physical activity level and health-related physical fitness (HrF) are among the main objectives of the curriculum (MoNE, 2018). In the abovementioned project in Turkey, focus group interviews were conducted with physical education teachers about the HrF knowledge and the level of use of that knowledge during classes. According to qualitative data in this project, teachers collect data from their students by using various physical fitness measurement methods; however, it is understood from the findings that they are insufficient in determining their student's needs by analyzing the data, designing the lessons based on the needs of the students and evaluating the development (Ince et al., 2020).

Furthermore, Ince and Hunuk (2013) reported that during in-service training, experienced physical education teachers, who were selected for guiding and advising the other physical education teachers in their regions by the MoNE, were determined not to have enough knowledge about how to measure and evaluate HrF in the physical education lessons. It seems crucial that professional development programs need to include supportive sessions to collect data from their students with a clear purpose, analyze and interpret the data, identify needs, adjust the lessons in line with the data, and measure and evaluate the effects of that adjustments.

There might be several reasons for teachers lack of knowledge and skills on relevant concepts. These may include not giving importance to their professional development after being appointed as a teacher, not designing the in-service training programs offered to teachers in accordance with the needs of teachers, evaluating the professional performance of physical education teachers with irrelevant criteria (e.g., school team success) instead of the goals specified in the curriculum (Ince et al., 2020). Despite emphasizing and accepting the need for teachers to be equipped with the required knowledge and skills to use data effectively and responsibly in undergraduate and professional development programs, there is not enough effort to develop teachers' capacity.

In recent years, studies have emphasized the importance and characteristics of quality professional development (Bechtel & O'Sullivan, 2006; Kulinna et al., 2008). The results of several studies emphasize that a quality professional development program should be prepared primarily in line with the needs of teachers and be challenging and intellectually stimulating (Armour & Yelling, 2007; Bechtel & O'Sullivan, 2006). In addition, teachers should be able to see themselves as group member in professional development programs and have the opportunity to cooperate with others in the group (Bechtel & O'Sullivan, 2006). For this reason, in this study, creating and maintaining a PLC is considered an appropriate method to develop DBDM knowledge and skills of physical education teachers.

To the best of our knowledge, there is no professional development program in Turkey specifically designed to improve teachers' DBDM knowledge and skills in physical education and sports. A significant challenge in DBDM is identifying and implementing effective professional development practices, which will transform teaching in this direction (Hamilton et al., 2009). Considering all of the issues discussed above, the purpose of this study was two-fold; (1) to design a data-based decision-making professional development (DBDM-PD) program for secondary school physical education teachers and (2) to examine the effects of this program on physical education teachers' data use, and instructional practices and their students' learning.

1.3. Research Questions

The following research questions are attempted to be answered by this study.

RQ. 1. What are the practices and needs of physical education teachers with respect to data use?

RQ. 1a. Which factors influence the data use of physical education teachers?

RQ. 1b. For which purposes are data being used by physical education teachers?

RQ. 2. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices, and their students' HrF knowledge and physical activity level?

RQ. 2a. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices?

RQ. 2b. How do teachers' participation in the DBDM-PD program structured as a PLC affect their students' HrF knowledge and physical activity level?

RQ. 3. What are the teachers' views on design, implementation and outcome the DBDM-PD program?

1.4. Significance of the Study

The concept of data use is based on high-quality data supportive of quality teaching and learning (Lai et al., 2014). Teachers generally make decisions about designing or adjusting their teaching based on their experience, intuition, and limited observations rather than on systematically gathered information (Ingram et al., 2004). These practices may cause waste time and resources when implementing new practices or curricula do not match the needs of students due to wrong intuitions (Earl & Katz, 2006). Data use expected to solve such problems as wasting resources.

In addition, schools are dynamic environments full of different populations and new curricula to adapt time to time. Staff, students and contexts may change in time, such that when children change or new teachers come to school, effective practices for previous groups may not work well and become quite ineffective (Lai et al., 2009a). Teachers and school administrators need quality data to monitor the ever-changing environment so they can react in a timely and evidence-based manner to identify and solve problems.

Most importantly, data use may lead to sustainable improvements in student learning and achievements. There has been increasing evidence that data use can lead to school improvement in terms of increased student achievements (Ansyari et al., 2020; Campbell & Levin, 2009; Lai et al., 2009b; Timperley et al., 2007).

In the Turkish educational context, there is a clear DBDM-PD need for secondary school physical education teachers (Ince et al., 2020; Ince & Hunuk, 2013). The effects of such interventions on student learning (HrF knowledge and physical activity level) have not yet been examined in the literature. In this study, a professional development program about DBDM structured as a PLC was designed for physical education teachers. After completing the professional development program, the teachers are expected to improve their professional knowledge of DBDM, which will contribute to their students' learning. In addition, the study has the potential to inform teachers and other relevant stakeholders about the underlying mechanism of professional development which is required to develop their knowledge and skills on DBDM and to transfer this knowledge into practice. Moreover, it may open the doors for disseminating this education for other physical education teachers and its use or adaptation in other teaching fields.

1.5. Definitions of the Terms

Data is defined as "information that is systematically collected and organized to represent some aspect of schools" (Lai & Schildkamp, 2013).

Data-based decision-making refers to "the systematic collection, analysis, examination, and interpretation of data to inform practice and policy in educational settings" (Mandinach, 2012).

Data-based decision-making professional development refers to training used to support teachers in understanding and managing their data, identifying weaknesses and their root causes, and then identifying an appropriate solution to address those weaknesses and leverage the strengths (Lai & McNaughton, 2016).

A professional learning community defines as a professional development method where teachers regularly come together with their colleagues in a non-hierarchical environment, discuss how they can do their jobs better through mutual interaction, and learn from each other's experiences (Wenger, 1998).

Health-related physical fitness knowledge is defined as knowledge about an individual's ability to participate in physical activity and to protect against chronic diseases. HrF includes the information necessary for general well-being (Keating et al. 2009). Body composition, cardiovascular endurance, muscular strength and endurance, and flexibility are the four main components of HrF (ACSM, 2010).

Physical activity is any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level (CDC, 2015).

CHAPTER 2

LITERATURE REVIEW

2.1. Data Use

Nowadays, data is essential in every sector to make decisions, such as creating commercials to increase sales by analyzing the market and the customers and the effectiveness of treatment in hospitals. In an educational setting, data is of utmost importance when examining students' needs to interpret them into instruction (Lai & Schildkamp, 2013).

Data are empirical pieces of information that educators can draw upon to make a variety of instructional and organizational decisions (Hamilton vd., 2009). Assessment data are the most prominent type of data used in the school context (Hamilton et al., 2009; Jennings, 2012; Supovitz, 2012). However, other qualitative and quantitative data may also be used by schools.

Since the use of data in education affects many decisions, such as the development of the school environment and the design of the instruction, it has an ever-growing significance. Data is "*information that is systematically collected and organized to represent some aspect of schooling*" (Lai & Schildkamp, 2013, p.10). Although this definition encapsulates a broad concept, including qualitative and quantitative measurements, objective data is the main feature (Wayman et al., 2012). Assessment data is the widely used data type in the educational context (Hamilton et al., 2009; Jennings, 2012; Supovitz, 2012), but this does not suggest that other qualitative and quantitative data is irrelevant. Ikemoto and Marsh (2007) categorized these different types of data as the following,

- *Input data;* one of which is student characteristics data, as the name suggests information on absenteeism, transfer or leave of school and mother language, ethnicity, and socioeconomic status, and the other is teacher characteristics data as in teacher qualifications and teaching experience.
- *Outcome data* is, as the name suggests, the outcome of the instructional processes demonstrated by the students where the achievement is observed. This type of data can be extracted from assessment results such as exams or portfolios or even from student well-being surveys.
- *Process data* is the data where the process analysis results are provided, such as observations on instruction, instructional and learning strategies' documentation, and organization of assessment.
- *Context data* is the data on school culture which can be the result of opinion-based surveys about the school environment and disciple or so or the data on curriculum. It can also be data on the usage frequency of educational materials or buildings.

If these types of data are considered in the schools' decision-making processes, it is called data-based decision-making, DBDM in short (Bernhardt, 2017; Schildkamp & Lai, 2013; Wayman et al., 2012). Data, information, and knowledge are a continuum (Ackoff, 1989) where data is interpreted into information, which ultimately creates a base of knowledge that affects decision-making (Mandinach et al., 2006). DBDM literature suggests that the term decision refers to the actions based on and in the influence of data as in the processes of goal setting, instructional adaptation, curricular adaptation, evaluation of the effectiveness of programs and practices, policy improvement, and reallocation of time and resources that are needed (Hamilton et al., 2009; Mandinach et al., 2011).

DBDM is the systematic collection and use of different types of data from various resources to improve student performance (Dunn et al., 2013). There is different terminology for this approach which are data-driven teaching (Fullan, 2007), data-driven decision-making (Wohlstetter et al., 2008), and data-based decision-making (Carlson et al., 2011). Despite the many names for it, the application of the approach is the same, that is, systematic improvement of education and grounding improvement-

oriented measures to interpret student performance data. Student performance data refers to the information about student needs that require tailor-made instruction according to those needs (Staman et al., 2017).

Using student data to improve student performance is very prominent in the education field. The question here would be how can the usage of data improve outcomes for the students. The answer is that it enables administrators and instructors to easily set learning goals, monitor the achievement of these goals, and scaffold the students along the way to achieving that specified goal (Bernhardt, 2003; Bernhardt, 2017). If there is a case where one of the processes fails, the decision-making of the changes within the curriculum, instruction, or even the organization can be discussed. In this way, data creates a pathway to continuously improve student performance by monitoring the practice effectiveness and their adjustment if needed (Timperley et al. 2007). In other words, it enables administrators and instructors to shape instruction and curriculum to achieve students' learning needs (Lai & Schildkamp, 2013).

2.2. Data-Based Decision-Making and Data Literacy

DBDM is becoming very popular, and the reason for this is that data is the core of high-quality decision-making as the instructors' experience and intuition are insufficient (Schildkamp et al., 2017).

The definition of DBDM is presented as "*teachers, principals, and administrators systematically collecting and analyzing data to guide a range of decisions to help improve the success of students and schools*" by Ikemoto and Marsh (2007, p. 108). This means that at every level of school administration and instruction, there is a need for data to analyze that is interpreted for decision-making. As the main goal to achieve here is to enhance student performance at its best, student performance data is considered. The use of standardized tests is common, but it is not adequate to consult alone, and additional data should be resorted to (Hamilton et al., 2009) such as homework, group work, and in-class observations, and this is because it provides insight of the process and is not summative as standardized tests.

The definition for DBDM when the classroom level is considered as cited: "*the identification of patterns of performance that unveil students' strengths and weaknesses relative to students' learning goals as well as the selection and planning of instructional strategies and interventions to facilitate student achievement of learning goals*" from Dunn et al. (2013, p. 225). It means that the more reflective instructors are of their methods and techniques and the student's needs, the better the student learning becomes (Schildkamp & Kuiper, 2010).

DBDM is accepted as a theorized process (Coburn & Turner, 2011; Hamilton et al., 2009; Means et al., 2009) where an actor (1) accesses or collects data, (2) selects, assembles, or analyzes data into information, (3) adds expertise and understanding to information that is gain to build knowledge, (4) takes an action or makes adaptations, and (5) assesses the outcome of those actions (Marsh, 2012). The process is complex, non-linear, and iterative (Ebbeler et al. 2016). This is why data literacy is essential to create and compensate for the needs of the students and the curriculum (Schildkamp & Poortman, 2015).

Knowledge and skills of effective data use by educators is called data literacy (Ebbeler et al., 2016). It includes having the knowledge and skills to access, collect, and analyze data, transform it into information, then from that information into decisions about improvement actions, and evaluate the outcomes (Mandinach, 2012). However, the terms' data literacy' and 'assessment literacy' are used interchangeably (Mandinach & Gummer, 2013). The general idea of data is perceived as assessment data, but this is not the only data to consult when making decisions for instruction (Mandinach & Gummer, 2013).

Assessment literacy is much more of a statistical or technical kind. To enhance school personnel's perspective of it, Zwick et al. (2008) defined it as an "*understanding of the psychometric and statistical principles needed for the correct interpretation of standardized test scores*" (p.15). Interpreting test scores is a significant part of assessment literacy (Sklar & Zwick, 2009), but making educational decisions and adequate comprehension of assessment processes is essential (Popham, 2011). Also,

according to Koh (2011), teachers' competence in developing and using assessments to evaluate students are the utmost qualification for assessment literacy.

In this manner, it can be seen that the term data literacy has a broader perspective as it includes all stages and types of educational data (van Geel et al., 2017), and it is the ability to understand and use data effectively to make decisions. The transformation of data into knowledge for decision-making requires educators to have specific knowledge backgrounds and skill sets (Mandinach et al., 2006) which are knowing how to identify, collect, organize, analyze, summarize, and prioritize data (Mandinach, 2012).

In a study by Mandinach and Gummer (2013) assessment literacy is seen as a component of data literacy for most educational data experts. Gummer and Mandinach (2015) created a conceptual framework for data literacy for teaching since there was an interchangeable use of data literacy and assessment literacy but no common operational definitions. Although researchers argue that data literacy is a broad term in education, the conceptual framework is suggested to be the base of teaching that is disassembled into parts and presented differently in the inquiry cycle steps (Gummer & Mandinach, 2015; Mandinach & Gummer, 2016). Data literacy for teaching involves a complex process of gathering the correct data to transform it into information to be interpreted as knowledge for decision-making in education.

2.3. The Purposes of the Data-Based Decision-Making

DBDM is essential for school development, instruction, and accountability (Schildkamp et al., 2017).

2.3.1. DBDM for Accountability

The accountability purposes of data use allow teachers to report to parents and educational inspectorates as the data from internal evaluations and external reports for student performance (Coburn & Talbert, 2006; Diamond & Spillane, 2004; Schildkamp & Kuiper, 2010; Schildkamp et al., 2013; Wohlstetter et al., 2008).

Accountability is supposed for school improvement, but this can also cause tension and conflicts (Hargreaves & Brown, 2013). This is why accountability depends on the fact that data is used to improve schools, instruction, and evaluation (Ingram et al., 2004), so that data is also used for school development and instruction.

2.3.2. DBDM for School Improvement

Data for school improvement involves data from school development, such as student surveys involving school environment and instructional quality to meet students' needs and achieve goals. This also suggests that time management is done for the sake of curricular needs. Student learning results and the quality of teaching are required to inform school improvement data to identify gaps in the curriculum for decision-making in the end-year professional seminars, for example. This enables the use of data to make school improvement data and its decision more precise (Breiter & Light, 2006; Coburn & Talbert, 2006; Schildkamp & Kuiper, 2010; Schildkamp et al., 2013; Wayman & Stringfield, 2006)

2.3.3. DBDM for Instruction

There are many ways of collecting and triangulating data for instruction, such as homework and examinations, as well as peer class observation and feedback to improve instruction. Data can be used to set learning goals, detect the discrepancies between student learning and curricular needs, create tailor-made instruction for each student, allocate time, give feedback, focus on smaller groups if necessary, selection of instructional materials, analyze student errors, adapt instruction on an inclusive manner (Breiter & Light, 2006; Coburn & Talbert, 2006; Schildkamp & Kuiper, 2010; Schildkamp et al., 2013; Wayman & Stringfield, 2006; Wohlstetter et al., 2008; Young, 2006).

2.4. The Factors Influencing the Data-Based Decision-Making

Data use alone does not suffice for the decision making but also the number of data characteristics, user characteristics, and organizational characteristics are essential

matters (Coburn & Turner, 2011; Datnow et al., 2013; Schildkamp & Kuiper, 2010; Schildkamp & Lai, 2013; Mandinach, 2012; Schildkamp & Poortman, 2015).

2.4.1. Data Characteristics

Several data characteristics identified by Schildkamp et al. (2017) are in effect regarding data use. Access to relevant data to analyze student performance is essential for teachers' improvement of their instruction. As instruction goes on, determining the needs and fallacies of the student performance depends on teachers' access to the data. Also, time is a matter of the essence regarding access (Breiter & Light, 2006; Datnow et al., 2007; Halverson, 2010; Schildkamp & Kuiper, 2010; Wayman & Stringfield, 2006).

Characteristics of data and data systems are also affecting the data usage in ways that contribute to accountability or instructional purposes for school development. Having information management systems that encapsulate access to relevant, reliable, and valid data show increased data usage and vice versa. If data is inaccessible, this level drops (Cho & Wayman, 2013; Coburn & Turner, 2011; Schildkamp & Kuiper, 2010; Wohlstetter et al., 2008).

2.4.2. Data User Characteristics

According to studies, data utilization also depends on particular user characteristics of teachers. To use data, instructors must have the knowledge and skills to analyze and interpret various types of data, understand the quality criteria for data use and data use concepts (e.g., data reliability, correlation), and be able to identify student needs for learning and modify instruction accordingly (Kerr et al., 2006; Little, 2012; Mandinach, 2012; Means et al., 2010; Nelson & Slavit, 2007; Park & Datnow, 2009; Sharkey & Murnane, 2006; Wohlstetter et al., 2008; Young, 2006).

The expertise and abilities of educators in DBDM are critical for successful DBDM. Firstly, knowledge and skills in data analysis and interpretation commonly referred to as "data literacy," is required. Educators must be able to convert raw data into

actionable knowledge; thus, skills such as data collection and organization, data analysis and summarization, and data synthesizing and prioritization are required (Bennett, 2011; Mandinach et al. 2006). Following that, users should be able to define SMART (Specific, Measurable, Attainable, Relevant, Time-Bound) and challenging goals based on DBDM data analysis. They should be able to adopt effective ways to fulfill these goals. Finally, instructors must implement the selected tactics in regular classroom instruction (Anderson et al., 2010).

Successful DBDM depends on educators' attitudes toward the subject (Schildkamp & Ehren, 2013; Schildkamp et al., 2014). A teacher's unfavorable DBDM attitude might significantly impede DBDM (Reeves & Burt, 2006). When adopting DBDM in their schools, administrators experienced many difficulties, including teachers' negative attitudes about testing because of how poorly those teachers utilized test findings (Reeves & Burt, 2006). The introduction of data use in schools requires fostering a positive attitude toward it (Datnow et al. 2007) or "buy-in/belief in data" (Schildkamp & Kuiper 2010).

It is also found that teachers' attitudes toward using data can also affect how they use it. Teachers are more likely to use data in their routine decision-making provided they trust in the use of data and that it is necessary to use data to determine specific student needs, that data is crucial for improving education, and that using data can benefit students (Luo, 2008).

2.4.3. School Organizational Characteristics

How statistics are used in schools can be influenced by a number of organizational characteristics of schools. If there is a shared vision that encompasses a common understanding of the characteristics of successful teaching, student learning, and efficient methods to evaluate student learning, data utilization in schools can be improved (Schildkamp et al., 2015). There should be standards for data use, which implies that the school requires an organized approach to data analysis and interpretation so that it can inform its decisions (Datnow et al., 2007; Halverson, 2010;

Sharkey & Murnane, 2006; Wayman & Stringfield, 2006; Wohlstetter et al., 2008; Young, 2006).

The successful implementation of DBDM depends heavily on the school leader (Ikemoto & Marsh, 2007; Levin & Datnow, 2012; Schildkamp & Lai, 2013). First, the school administrator can play a crucial role in setting up the practical prerequisites for DBDM, such as choosing an appropriate student monitoring system and giving instructors time for DBDM activities and collaboration (Datnow, 2012; Ikemoto & Marsh, 2007; Schildkamp & Lai, 2013). A school administrator can also affect teachers' opinions of DBDM by encouraging and facilitating data utilization (Wayman et al., 2012). Last but not least, the school leader can benefit the school's data culture by advocating a strong and explicit DBDM goal and having clear regulations and standards for data use (Marsh, 2012). The name for this kind of vision would be "a group's appreciation for the importance and power that data can bring to the decision-making process" (Hamilton et al., 2009, p. 46).

To adopt and maintain DBDM, a culture that promotes data utilization and is achievement-oriented is viewed as vital (Mandinach, 2012). In schools where team members need to examine data critically, reflect on their performance, and are open to changing their approach when evidence indicates a necessity to do so, DBDM is best utilized, according to Lai and Schildkamp (2013). Yet, when one feels threatened, it might be challenging to look closely at how they are functioning (Marsh, 2012). Creating a culture of data in schools requires a trusting environment (Ikemoto & Marsh, 2007; Marsh, 2012; Visscher & Ehren, 2011). Data are used in such a culture to assist improvement rather than to pass judgment.

Strong internal collaboration benefits DBDM within the institution (Schildkamp & Lai, 2013; Schildkamp & Poortman, 2015). Teachers have more access to data analysis knowledge and abilities and more opportunities to discuss performance objectives and share successful goal-attainment tactics when working in highly collaborative teams. Thus, effective teamwork improves a team's ability to work in a data-based manner (Jimerson & Wayman, 2015). Additionally, data utilization needs assistance. For instance, teachers require assistance in using data effectively for the sake of their

practice, which calls for the availability of a data expert to respond to their inquiries and the allocation of time specifically for data usage (Marsh et al., 2010; Marsh, 2012).

2.5. Data-Based Decision-Making Related Studies

According to a number of studies, using data to inform decisions can assist teachers in improving instruction and aid students in achieving better learning outcomes (Carlson et al., 2011; Gelderblom et al., 2016; Lai & McNaughton, 2016; Poortman, & Schildkamp, 2016; van Geel et al., 2016). Consequently, policymakers and stakeholders in education have begun to pay attention to these potential effects to engage in professional development to equip teachers with data literacy to improve student performance.

The effectiveness of instructors' instruction has a significant impact on student's academic performance (Hattie, 2009), and using data in instruction can raise students' academic performance (Campbell & Levin, 2009; Carlson et al., 2011; Lai et al., 2009; McNaughton et al., 2012; van Geel et al., 2016). In using student achievement data to modify classroom instruction to meet the needs of the children, teachers require assistance in improving their skills and knowledge (Datnow et al., 2007; Slavin et al., 2013).

2.5.1. DBDM Effects on Teachers' Data Use and Instructional Practices

A study by Kippers et al. (2018) investigated the extent to which educators improve data literacy components (set a purpose, collect, analyze, and interpret data, and take instructional action) during a one-year intervention regarding data use. Additionally, researchers concentrated on what these educators learned and handled these components. The participants of this intervention were teams of teachers, school leaders, and a data expert. A mixed-methods research design was employed for the related study. Quantitative data were gathered from a data literacy test (N = 27), and qualitative data were collected through interviews (N = 12), meeting evaluations (N = 33), and logbook entries for meetings. The findings indicated that following a data use intervention, the data literacy of educators increased significantly. In educators

perspective or in the opinion of the data coach, some examples of what educators had learnt are the significance of saving data (properly) in the student monitoring system, utilizing Excel to analyze data, and refuting misconceptions.

Ebbeler et al. (2017) focused on educators' data literacy skills and designed a one-and-a-half years intervention regarding data use in the form of teams to provide PD in data use in secondary education. One of the purposes of the study was to investigate the extent of development in educators' data literacy skills, and data use attitudes. Data teams were formed of 4–6 teachers, 1–2 school leadership team members, also an internal data expert (if available in the school). They were coached by an external data coach. The quasi-experimental research design and a mixed methods approach were used in this study. The data collection tools were a data use questionnaire for data team schools (N = 9), a knowledge test for data team participants (N = 36), and semi-structured interviews (N = 11) from three case study schools. The results of educator learning indicated a small to medium effect for the data literacy knowledge test and a medium effect for the data use questionnaire. The interview findings also revealed that the data literacy skills of data team members have developed. In addition, educators in the data teams used data less frequently for accountability purposes and their awareness of the use of data for school development and instruction increased.

The study by van der Scheer et al. (2017) explored to what extent an intensive, coaching-based DBDM-PD program affects teachers' instructional practices. The study design was a short interrupted time series research design in which each teacher as well as a pair of teachers was videotaped three times during a math class both before and after the PD program. The participants of the study were 34 teachers teaching grade 4 from 26 primary schools. They attended a DBDM training containing seven meetings (five groups of teachers) and four coaching sessions throughout one school year. The International Comparative Analysis of Learning and Teaching (ICALT) instrument including various DBDM components of interest, was employed to measure teachers' instructional skills. The study's main finding is that teachers significantly improved their teaching skills regarding DBDM. Teachers applied instruction groups more frequently and discussed/presented lesson objectives more following the intervention. Additionally, teachers' initial fundamental teaching skills

do not seem to be important in terms of the extent to which they improve their DBDM instructional skills. This finding is encouraging for the promotion of DBDM.

The study by van Geel et al. (2017) took place within the framework of a thorough professional development intervention: a two-year training program for all primary school teams with the goal of developing DBDM knowledge and skills as well as implementing and maintaining DBDM within the school organization. It focused on studying the changes in the data literacy of educators regarding student monitoring system data (SMS) due to the DBDM intervention. Researchers used a multivariate approach of the pre-post design for this study. The data literacy levels of 1182 educators from 83 schools (from 53 schools in Cohort 1 and 48 schools in Cohort 2) were examined by a SMS data literacy test. The results indicated that offering a long-term, intense PD trajectory, aimed at directly applying new skills in the context of participants' own school, can significantly increase educators' data literacy related to SMS data.

2.5.2. DBDM Effects on Student Achievement and Performance

The research in the area shows that if teachers are taught in DBDM, data utilization not only assists teachers but can also improve student learning. Although most studies were conducted in the context of research interventions and other types of professional learning, many studies provide encouraging evidence of improvements in student outcomes based on larger-scale projects. For instance, national projects using more rigorous research designs (randomized experimental and quasi-experimental designs) also show student performance improvement (Campbell & Levin 2009; Lai et al. 2009; McNaughton et al. 2012, Staman et al., 2017).

According to Keuning et al. (2019), DBDM-trained primary school instructors had a more significant impact on their pupils' math and spelling skills than the teachers who weren't DBDM-trained. According to research by Carlson et al. (2011) investigating the outcomes of a DBDM intervention, schools were coached on how to evaluate and interpret student performance. They were given assistance in choosing and putting into practice evidence-based improvement strategies. A rigorous randomized experimental

design was used to examine the mathematics and reading success outcomes from more than 500 schools across 59 districts. The findings of this study demonstrated a favorable trend in reading achievement and higher student achievement in mathematics as a result of teacher training on the interpretation and application of data.

Slavin et al. (2013) also explored the identical DBDM intervention experimentally, but this time over four years rather than one. For reading and mathematics in grades five and eight, both statistically significant positive and statistically non-significant effects were discovered. In the third and fourth intervention years of grade five, statistically significant differences in reading and math were discovered. In the first year of the intervention, math and reading showed positive, statistically significant impacts in grade eight. Positive substantial impacts were only found for reading in the second intervention year and mathematics in the fourth intervention year. The fact that the biggest impacts were discovered after four intervention years is a significant result. This is because, concerning the researchers, the schools' implication of the intervention improved only after the third year and has changed. This study shows that duration is the essence when it comes to characteristics of effective professional development that influence learning and changing practice.

Parallel to this, a review of the literature on professional learning that affects student achievement discovered that institutions that used data to assess the efficacy of their teaching and institutional practices experienced considerable gains in achievement (Timperley et al. 2007).

A DBDM intervention was created at the University of Twente in the Netherlands, where whole school teams participated in the training. Teachers taught how to assess data, develop goals, select instructional strategies based on these data, and then modify their classroom instruction as necessary. DBDM was introduced as a systematic approach. 53 elementary schools in the initial cohort participating in the DBDM intervention in 2011 demonstrated encouraging outcomes. According to the study of student accomplishment statistics in mathematics, every pupil participating improved significantly over the two intervention years, receiving roughly one extra month of schooling (van Geel et al., 2015).

Van Kuijk's research (2014) illustrates another Dutch study into DBDM According to a study utilizing a matched-pairs design, there was an effect of 0.37 for reading comprehension, while the same intervention had no statistically significant effects on students' mathematical ability (Ritzema, 2015). In both projects, instructors received training on how to create standards and performance goals for every student and how to use data and apply modeling to reading and math instruction.

2.6. Data-Based Decision-Making in Physical Education

2.6.1. Data in Physical Education Curriculum

The primary focus of physical education is on the growth of the human and motor systems through knowledge and practice of physical activities (MoNE, 2013). Early in the 1990s, developed nations began to doubt the value of physical education in schools due to the alarming rise in the obesity pandemic among children, adolescents, and adults worldwide (Sallis & McKenzie, 1991). Then, with a focus on health-related physical education and physical exercise, school physical education curricula were modified, particularly in Canada, the United States, England, and Australia (Houston & Kulinna, 2014; Leggett, 2008; Lynch, 2014).

In several nations, the topic of HrF is now being covered more in the context of physical education programs. Similar revisions were made to the elementary school physical education curriculum (1–8) in Turkey in 2006–2007 (MoNE, 2007). The new physical education curriculum has given HrF knowledge and practices a significant role within the "Active Participation and Healthy Life" learning area (Ince & Hunuk, 2013; MoNE, 2007). The Ministry of National Health (MoNH) and the Ministry of Education (MoNE) together created the Health-Related Physical Fitness Report Card in this context to track students' levels of Hrf (between 5th and 12th grades), and it was first put into use during the 2016–2017 school year. At the start and conclusion of each academic year, physical education instructors were asked to measure their pupils' body weight, height, flexibility, sit-ups, push-ups, and sit-to-reach distance (MoNE, 2018). Additionally, physical education instructors are required to improve their

students' HrF abilities and understanding and provide a learning environment that meets their requirements (Ince & Hunuk, 2013).

The three core learning areas of the high school physical education and sports curriculum are movement competence, an active and healthy lifestyle, and life skills (MoNE, 2018). The learning outcomes of the program consist of several skills and thus under the fundamental movement skills (relocation, balancing, object control), individual, team, alternative environment (nature), rhythm/dance, racquet and water sports groups of games and sports; under an active and healthy life, health-related physical fitness, health protection, conscious consumerism and our cultural heritage related to physical activity and sports; under life skills, critical thinking, individual and social responsibility, various values and communication/social skills. The expectation from teachers to ensure that their students reach these learning outcomes is to prepare the necessary learning environment, implement these skills in the lesson, and measure and evaluate the learning level of the students. In order to achieve the learning goals in the curriculum, teachers are recommended to determine their students' needs, review their social and physical learning environments, and design and implement student and school-specific adjustments.

In addition, public and private institutions related to education define teacher competencies considering professional roles and responsibilities expected from teachers and scientific knowledge. The American National Board for Professional Teaching Standards operationalized these roles and responsibilities as identifying student needs, setting a goal, designing instruction in line with the goal, measuring and evaluating student learning in line with goals, making reflections, and preparing for the next step (NBTS, 2016). To fulfill all these responsibilities, teachers need data. Data can help teachers monitor their constantly changing environment, their functioning, and to what extent curriculum aims are met, and react promptly and in an evidence-based manner when problems need to be solved (Schildkamp & Kuiper, 2010).

The current physical education program aims to support students' daily physical activity, physical fitness, proficiency in various physical and sportive skills, and

knowledge of living an active and healthy lifestyle (MoNE, 2018). The active and healthy life learning area consists of knowledge and skills related to regular physical activity, health-related physical fitness, health protection, and our cultural heritage regarding physical activity and sports. The focus of this study was HrF knowledge and physical activity participation.

Physical education and sports lessons should be used to determine the student's individual needs in line with the lesson objectives, to try the sample applications, and to follow their development. Students should reinforce their work in the classroom by participating in appropriate physical activities and sports outside the classroom. For this reason, teachers should guide and support students to recognize physical activity opportunities in their lives and use them effectively (MoNE, 2018).

Physical education and sports lessons in schools positively affect students' participation in lifelong physical activity (Haerens et al., 2011; Harris & Cale, 2018; Houston & Kulinna, 2014). Physical education and sports lessons in schools are the prominent institutions that positively affect youth's development of physical activity behaviors (Cale, 2000). A decent physical education and sports class should reinforce students' regular participation in physical activity (Tannehill et al., 2013; Pot et al., 2018). Besides, young people should be taught how to be active outside of school so that physical education and sports classes can reach their health goals (Fernandez-Rio, 2016). In this context, it is crucial to use data to promote, support, and monitor physical activity in children and young people and improve their physical fitness (WHO, 2019).

Developing HrF knowledge helps people to interiorize and maintain physically active lifestyles and increase their motor skills (Committee on Sports Medicine and Fitness and Committee on School Health, 2000). Therefore, it is an essential concept for physical education and sports lessons to achieve learning goals (Lloyd et al., 2010). It has been claimed that HrF knowledge deficiency is one of the main factors causing physical inactivity (Keating et al., 2009). Studies show that both teachers and students should have accurate and reliable HrF knowledge for students to acquire and maintain healthy physical activity behaviors (Aubert et al., 2018; Sukys et al., 2019; Wilkie et

al., 2016). Despite this, studies conducted in Turkey have exhibited that students' HrF knowledge is low (Cengiz & Ince, 2014; Serbes et al., 2017).

2.6.2. Measurement and Evaluation in Physical Education

Measurement and evaluation, being an integral part of the teaching process, is carried out to determine the success and shortcomings of students, to understand the effectiveness of teaching methods, and to reveal the strengths and weaknesses of the program (MoNE, 2004). Teachers who are able to carry out this process properly will have the opportunity to perceive their students and their capacities more closely and to revise the teaching process to make efforts to make up for their deficiencies, if any (Çelik & Arslan, 2012). Therefore, a vital feature teacher should have is that they are equipped with adequate measurement and evaluation knowledge and skills (Çakan, 2004). Although measurement and evaluation have different functions, they are two interconnected processes and indispensable in the teacher's responsibilities (Wiggins, 1998). Measurement is defined as the process of observing the features and structures found in the individual, expressing the results of observation with numbers and symbols according to specific rules, and evaluation as the process of making meaning out of the measurements obtained and reaching a decision with the help of a criterion (Çelik, 2005). A teacher who conforms to measurement and evaluation techniques will not only reach less inaccurate assessment judgments but can also assess and develop their instruction methods (Turgut & Baykul, 2012).

With assessment and evaluation, it is revealed whether the education programs have achieved the desired achievement and whether the knowledge, skills, and attitudes expected from the students have developed (MoNE, 2009). At the same time, with the continuous monitoring of the education process, it is possible to identify and organize the problems that arise step by step (Can, 2014). As a result of measurement and evaluation, all evaluations aimed at revealing whether or to what extent the desired behaviors have arisen, finding learning complications, determining the effectiveness of the methods and techniques of educational programs, directing students, and similar purposes are based on valid and reliable assessment results (Atılgan, 2017).

Like all other courses in the education system, measurement and evaluation, a complementary element of the training programs, is crucial in the physical education course. In physical education classes, students learn not only short-term sportive achievements but also various motor skills, sports knowledge, and many abilities by incrementing their physical fitness for an active lifestyle (Shephard & Trudeau, 2000).

Measurement and evaluation of the student's achievement in physical education courses are imperative. Considering that physical education and sports lessons are not adequate during class hours, students should be directed to sports activities outside the course and redounded the habit of doing sports. For this reason, extracurricular activities should also be included in the scope of evaluation in physical education (Sirinkan & Ercis, 2009).

Considering that the physical education lesson aims to create desired changes in the behavior of the individual (Ertürk, 1998), the achievements that are the manifestation of physical, dynamic, cognitive, sensory, and social development that the physical education curriculum aims to bring to the student should be assessed and evaluated (MoNE, 2008). Since, as a result, a curriculum is carried out without measurement and evaluation, it is not likely to reach evidence showing whether the targeted achievements have been realized (Arslan et al., 2013).

Various research carried out in our country shows that physical education teachers evaluate only the achievements of students related to the psychomotor field, and the achievements associated with the sensory and cognitive fields are disregarded (Arslan et al., 2013; Avsar, 2009; Tekin & Tasgın, 2009; Yilmaz & Gunduz, 2008). On the other hand, various research results disclose that physical education teachers do not consider themselves efficacious in assessing and evaluating (Genç, 2008; Sirin et al., 2009; Yılmaz & Gunduz, 2008).

Although schools have a multitude of qualitative and quantitative data readily available coming from a broad variety of sources (Ikemoto & Marsh, 2007; Piety, 2017), research about data use in schools shows that summative data, specifically student achievement data, are most commonly used by educators (Halverson &

Thomas 2007; Shen et al. 2010). However, student achievement data alone provide little information about the reasons behind the achievement results or about valuable strategies that can support learning (Anderson et al., 2010; Ebbeler et al., 2017). Therefore, data is defined as any factual material that is systematically collected and relates to the functioning of a school and its teachers and the learning outcomes of its students. It can consist of assessment data, inspection data, observations, background information on students, and so forth (Ikemoto & Marsh, 2007; Schildkamp & Kuiper, 2010).

Formative and summative evaluations are frequently distinguished in education. The prevailing theory in the literature holds that the difference is due to the use of the data. Assessment findings serve a summative purpose if they are used to help determine whether a candidate has mastered a particular topic domain. Examples of summative purposes include selection, categorization, certification, and placement. Assessment is formative if the goal is to direct the learning process using the outcomes (Van der Kleij, et al., 2015). Summative and formative assessment goals can overlap as both primary and secondary goals of the same assessment, therefore, they are not mutually incompatible (Bennett, 2010).

There are numerous processes involved in using data formatively to guide education at the classroom level. Data collection, analysis, and interpretation are all steps in using data to improve teaching and learning. Setting a clear purpose for data use in this regard, collecting data, analyzing it to determine learning progress and specific student needs concerning the goals, interpreting the data to identify potential actions to improve student learning, acting to enhance student learning, and evaluating the findings of such decisions. A feedback loop is established, and a fresh cycle of data gathering may follow the assessment, which makes DBDM, a cyclical and repetitive process (Hoogland et al., 2016; Schildkamp et al., 2016; Van der Kleij et al., 2015). As a result, data offers teachers feedback on their instructional strategies (Mandinach & Jackson, 2012), enabling them to engage in an iterative and cyclical process in which they can examine the impact of their actions on students' performance and modify their instruction in response to the results (Gelderblom et al., 2016).

2.7. Data-Based Decision-Making Professional Development

2.7.1. Professional Development

Professional development focused on helping teachers and/or school administrators understand and manage their data, identify strengths and weaknesses and the underlying causes of those weaknesses, and then choose an appropriate solution to address those weaknesses and build on the strengths is known as data use professional development. As a consequence, it is more consistently related to the use of data for evidence-based teacher inquiry than to accountability (Lai & McNaughton, 2016).

The few experimental and quasi-experimental research on the advancement of data utilization yield contradictory findings. Previous studies on professional development initiatives for data users that mostly used student evaluation data revealed minor or no effects. For instance, Carlson et al. (2011)'s randomized control experiment across districts discovered no significant impacts of the use of benchmark tests on reading exams but substantial but very modest effects of the use of benchmark assessments on state mathematics examinations. According to Slavin et al. (2011), professional development often led to modest impacts in the first two years at both grade levels and topics, with more significant outcomes by the fourth year of professional development.

Recent quasi-experimental research with specific student demographics points to greater and more beneficial impacts (Lai et al., 2009; Lai et al., 2014). Although these studies included professional development beyond data use and were smaller scale studies than those that observed a relatively small impact on achievement, they nevertheless discovered that data use professional development combined with other intervention characteristics was able to narrow lengthy achievement gaps between indigenous and ethnic minority students (Carlson et al., 2011).

Case studies of districts in the United States and Canada that have considerably increased attainment point to the use of data to guide district and school choices, along with other characteristics like coherence (Campbell & Levin, 2009). However, such case studies frequently offer explanations for successful outcomes after the occurrence

(Slavin et al., 2013), while it is uncertain whether schools and districts that did not see improvements employed the same data use approaches (Herman et al., 2008). However, these case studies are supported by research like Timperley et al. (2007)'s evidence-based compilation of professional development that had an impact on student performance.

2.7.2. Professional Learning Communities

The greatest way to use data is via collaboration, such in professional learning groups. A PLC is made up of a group of instructors who are committed to collaborative learning via the exchange of reflections and experiences. PLCs with a data use focus can alternatively be referred to as data teams or inquiry teams (Marsh et al., 2015; Nelson et al., 2008). Collaboration has been cited as one of the essential components for teachers' professional growth throughout the past 20 years (Avalos, 2011; Binkhorst et al., 2015; Borko, 2004). According to Datnow et al. (2013), teamwork is crucial for professional growth in data use.

In a number of researches, professional growth is frequently more successful in PLCs. According to studies, teacher cooperation can enhance student and instructor learning (Borko, 2004; Darling Hammond, 2010; Stoll et al., 2006; Vescio et al., 2008). PLCs also agree that it is collaborative groups of teachers and occasionally school officials Stoll et al. (2006). PLCs are characterized by a number of shared values and visions, group duties, participation in reflective professional inquiry, cooperation, support for both individual and group learning, trust between members, inclusiveness, and openness. Ball and Cohen (1999) contend that the inquiry element of PLCs is essential because it may enhance education and raise student accomplishment (as cited in Schildkamp et al. 2006).

The collaborative nature of PLCs has the potential to influence teachers' data-use abilities. According to the multischool data-use research by Datnow et al. (2012), social interactions significantly impacted how instructors used student data. Similarly, Symonds' (2003) investigation of Bay Area institutions that saw academic growth discovered that teachers' use of data was aided by professional teamwork. Mason

(2003) found that instructors at one school significantly altered their attitudes toward data usage via involvement in PLCs, perceiving student data as a tool for progress rather than an accountability metric. This was a broader, six-year examination of 11 Milwaukee public schools.

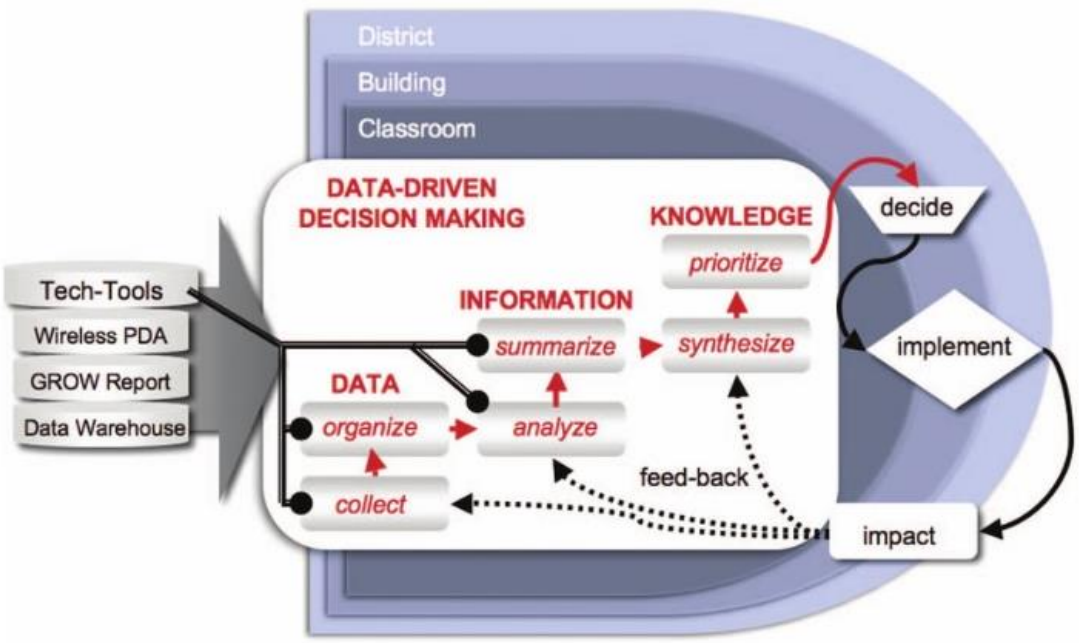
The foundation of professional learning communities is two presumptions. First, it is presupposed that knowledge is grounded in instructors' everyday experiences and is better described via critical reflection with those with similar backgrounds (Buysse et al., 2003). Second, it is anticipated that instructors will actively participate in PLCs, which will advance their professional expertise and improve student achievement (Vescio et al., 2008)

2.7.3. Conceptual Framework of Professional Development Program

As the body of literature on DBDM continues to expand, several theoretical frameworks have been developed (Abbott, 2008; Easton, 2009; Hamilton et al., 2009; Ikemoto & Marsh, 2007; Mandinach et al., 2008; Means et al., 2010). They all have elements that involve a cyclical data-use process, and the processes often have macro-level definitions, each including unique but related components. The paradigm developed by Mandinach and collaborators (2008) has the benefit of delving into and illuminating the cognitive abilities that are thought to be crucial in DBDM. It represents a theoretical model that is founded on practitioner research and a cognitive examination of the study's findings.

The paradigm is based on a continuum wherein data are changed into information and, eventually, into knowledge, as seen in Figure 2.1. This is based on the realities of the classroom, the institution, and the district, which all will make judgments using various facts in various ways. To allow, assist, and improve decision-making by diverse stakeholders in various regions of the model, technology-based tools play a crucial role. Data are perceived as existing in a raw, meaningless condition; they are just statistics. Data that has been given meaning in a specific context is called information. A body of information judged valuable for directing action is referred to as knowledge. Data, or concrete figures, include a student's formative assessment results. The

information would consist of a report detailing how the students scored on the examination after the data had been summarized. Knowing how to translate this data into a prioritized list of actions the instructor may take to boost performance and address the pupils' learning difficulties would be knowledge (Mandinach et al., 2008).



Conceptual framework for data-driven decision making. Reprinted with permission from A Conceptual Framework for Data-Driven Decision Making by E. B. Mandinach, M. Honey, D. Light, and C. Brunner. Copyright 2008 by Teachers College Press (color figure available online).

Figure 2. 1. Conceptual framework of professional development program

The locations along the continuum were linked with six skills that were found. Users gather and arrange data at *the data level*. Traditionally, the first stage in a data-driven inquiry process is data collection. Teachers may gather concrete examples, classroom exercises, individual portfolios, and other information on student performance. These data could also include demographic, health, or behavioral information. To take account of these facts, they must then be structured in some fashion. In other words, the educators will combine information from several sources in a triangulated manner and arrange it to make sense. But the data alone is just a collection of statistics. To analyze and interpret the data, it is necessary to contextualize it (Mandinach et al., 2008).

Users summarize and analyze information at the *information level.* To root the data and turn it into information, they need context. To attempt and understand performance patterns, the teachers will evaluate the data, looking at performance trends, diving down to item levels, and looking at combined and stratified data. Then, they can create summaries on the academic progress of certain pupils or classes of students. They will be able to concentrate on performance trends that could need instructional intervention using these summaries. The raw data has been turned into comments regarding what subjects' pupils have acquired and where there may be problems through analysis and summary (Mandinach et al., 2008).

Knowledge is then created from that information. Users prioritize and synthesize knowledge at the level of knowledge. The data is then aggregated to enable the instructors to build a knowledge foundation about student performance on which they may make instructional decisions. Finally, the teachers must classify the information and knowledge to decide what steps to follow. Prioritizing the synthesis enables the user to comprehend the potential actions and choose which actions may be translated into actionable tasks depending on information about the situation (Mandinach et al., 2008).

The choice is then put into action, and the results are looked at afterward. They'll look at the students' performance. The teachers will choose how to adapt the curriculum to the needs of the students. The results will then indicate whether the user needs to go back to a prior process step, such as collecting additional data or reanalyzing certain information, since DBDM is an incremental method rather than a linear one. The educators may determine they require more performance indicators from which to choose. To assess how specific student groups are performing, they may need to conduct a new analysis of the data by decomposing it, after which they may adjust their instructional choices (Mandinach et al., 2008).

2.7.4. Theoretical Underpinnings of DBDM

Early DBDM initiatives were founded on neobehaviourism and cognitive theory (Stobart, 2008); hence the sociocultural context in which learning took place received

little explicit attention. In the past, DBDM prioritized achieving predefined objectives, determining whether the goals had been reached, and modifying the learning environment as necessary. This method was primarily transmissive, which meant that educational facilitators—such as teachers—were obliged to provide students with sufficient instruction. According to this perspective, learning is a personal activity, and examinations are used to determine each student's aptitude (Elwood, 2006), following a psychometric framework (Moss et al., 2005). For this reason, the standardized tests would never make up for the analysis method of DBDM alone.

Recently, though, DBDM appears to have shifted a little more in the direction of a sociocultural paradigm, emphasizing the constant adaptation of learning environments to support and enhance learning processes while considering learners' needs and unique traits. The focus is therefore placed on data utilization within a specific context rather than just identifying or adjusting for the context (Coburn & Turner, 2011; Schildkamp et al., 2013; Supovitz, 2010). Although there is evidence of this trend in many nations, not all have experienced it.

Teachers can design suitable learning objectives based on student progress by using data. Teachers may then evaluate and keep track of whether students are making progress toward their goals, so if required, modify their teaching (Bernhardt, 2003; Earl & Katz, 2006). DBDM is employed in this manner for formative evaluation. Instructors and school administrators can use formative assessment data to design policies, plan for school improvement, develop teachers, and track how well the school's objectives are being implemented (Schildkamp et al., 2013; Schildkamp & Kuiper, 2010

Table 2. 1. Data-based decision-making related studies

Author/s (Year)	**Outcome Variable**	**Method**	**Participants**	**Findings**
van der Scheer &Visscher (2018)	Students achievement in Math	Randomized Control Trial	Teachers (*n* = 58) and students Experimental group: 25 teachers, 19 classes and control group 33 teachers, 29 classes	The intervention had a considerable positive impact on students who got extended instruction, even if there was no main effect on their mathematical achievements.
Staman et al. (2017)	Students' Math performance	Quasi-Experimental	Students (*n* = 42 schools in experimental group; *n* = 42 school in control group)	There were no main effects of DBDM intervention on student performance but interaction effects with students' low previously achievement levels and socioeconomic status.
Poortman & Schildkamp (2016)	Students achievement in English	Quasi-Experimental	Teachers (4-6), school leaders (1-2) and a quality care manager in a data team from schools (*n* = 10)	Four of the nine teams were unable to resolve their issue, while four were successful significantly in raising student achievement. Other school achieved significant developments in relation to a portion of their issue.
Lai & McNaughton (2016)	Students' reading comprehension	Quasi-Experimental	Students (*n* = over 7800) and schools (*n* = 53) (over eight years)	Writing, reading comprehension, and high school qualifications accomplishment levels increased as a result of the intervention. In general, effect sizes were largen than international comparisons.
van Geel et al. (2016)	Students achievement growth	A multiple single-subject design	Student from Dutch primary schools (*n* = 53)	Results show that DBDM can raise student achievement, particularly among those who attend schools with low socioeconomic status.

Author/s (Year)	Outcome Variable	Method	Participants	Findings
Keuning et al. (2019)	Students' Math and spelling achievement	A hierarchical multiple single-subject design	Students from elementary schools (n = 39). For Math (n = 8.023), for spelling (n = 6.610)	Findings showed that both math and spelling benefited from intervention. Additionally, the mathematics intervention was most beneficial to low-SES pupils and schools.
van Kuijk et al. (2016)	Students' reading comprehension	Quasi-Experimental	Students (n = 819) for experimental group (n = 420); the control group (n = 399)	Experimental group students performed much better than those in the control group on a standardized test. Students in the experimental group were more than six months ahead of the control group at the end of the program.
Konstantopoulos et al. (2013)	Students' Math and reading achievement outcomes	Cluster randomized experiment	Students from experimental schools (n = 35) and control schools (n = 24)	The intervention effect is smaller from kindergarten to second grade and larger from third to eighth grade. Significant intervention effects were found in grades 3 to 8, particularly in third- and fourth-grade reading and in fifth- and sixth-grade math.
Kippers et al. (2018)	Teacher data literacy	Mixed Method Design (A single-group pre-post design)	In-service teachers (n = 27)	Findings demonstrate a considerable improvement in data literacy of educators. Educators also learned the importance of storing data, using Excel for data analysis, and refuting misconceptions.

Author/s (Year)	Outcome Variable	Method	Participants	Findings
Ebbeler et al. (2017)	Teachers data literacy skills and attitudes	Mixed Method (Quasi-Experimental)	Data team schools (n = 9) and comparison schools (n = 42) for a data use questionnaire, Data team participants (n = 36) for a knowledge test, interview (n = 11) from case study schools	The respondents improved their data literacy skills and had a more favorable attitude about the data use.
van Geel et al. (2017)	Teachers data liteacy	A multivariate multi-level modeling	Teachers in total (n = 1182) from school in Cohort1 (n = 53) and schools in cohort 2 (n = 48).	Educators' data literacy with regard to SMS data developed significantly.
van der Scheer et al. (2017)	Teachers' instructional skills	A short interrupted time series research design	Teachers from 26 primary schools (n = 34)	Teachers' DBDM skills significantly developed after the intervention. Teachers' initial fundamental teaching skills do not seem to be important in terms of the extent to which they improve their instructional skills regarding DBDM.
Abrams et al. (2021)	Teachers data literacy and data use practices	Mixed-method design	Elementary and middle school teachers (n = 28)	There is a significant increase in teachers' reported data literacy.
Gelderblom et al. (2016)	Teachers instructional skills	Mixed-method design	Teachers for survey (n = 318) and interview (n = 18) from 18 different schools	The majority of teachers utilize data to improve their instruction. However, they do not fully exploit all accessible data and do not perform all pertinent analysis. Teachers typically use data when learning outcomes of their students are poor.

Author/s (Year)	Outcome Variable	Method	Participants	Findings
Supovitz &Sirinides (2017)	Teachers' instructional practices and views about the importance of data on teaching and learning	Randomized Control Trial	Teachers from 27 PLC (*n* = 64) (34 in experimental groupd and 30 in control group)	The intervention had moderate but significant effects on external assessments of the instruction's quality. Teachers' self-reported data proficiency or opinions of the significance of data had no impact.

CHAPTER 3

METHODS

This chapter includes knowledge about research design, sampling and participants, intervention, data collection instruments, data collection procedure, data analysis, researcher's role, and study limitations.

3.1. Research Design

A mixed methods research design was used for this study. Mixed methods design is *"a procedure for collecting, analyzing, and mixing both quantitative and qualitative methods in a single study to understand a research problem*" (Creswell & Plano Clark, 2007). Mixed methods research offers a more comprehensive understanding of research problems than using either quantitative or qualitative results alone (Fraenkel et al., 2015). By combining the approaches, researchers get new knowledge and insights that move beyond separate results of quantitative and qualitative approaches (Creswell & Plano Clark, 2018).

A convergent (the parallel-databases variant) mixed method design was applied for this study (Creswell & Plano Clark, 2018). In this design as seen Figure 3.1, quantitative and qualitative data are collected and analyzed separately and then merged to compare or combine these results (Creswell & Plano Clark, 2018). The convergent design aims to complement one method's weaknessess with the other's strengths by using both methods together (Creswell & Plano Clark, 2018).

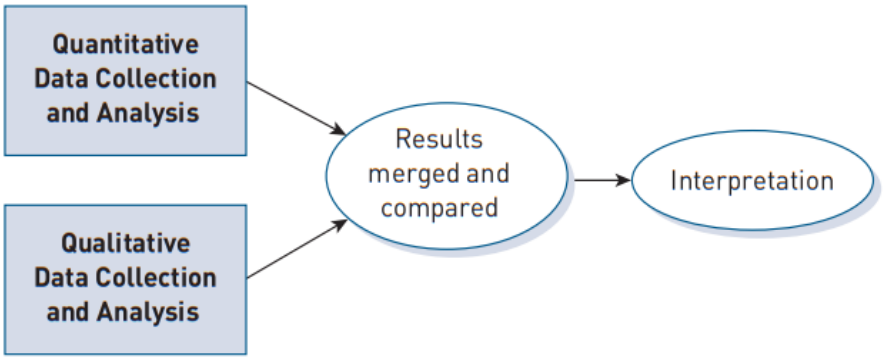


Figure 3. 1. A convergent mixed method design (Creswell & Plano Clark, 2018, p. 66).

3.1.1. Qualitative Part of Study

The purpose of the qualitative part of the study was to (1) design a DBDM-PD program structured as a PLC for secondary school physical education teachers and (2) examine the effect of that intervention on the physical education teachers' data use and instructional practices.

Using a qualitative method lets the researcher investigate subjects from the viewpoint of individuals who know them the best. It also provides an understanding of how individuals interpret their experiences (Merriam & Tisdell, 2016). Therefore, only experimental group teachers were included in the qualitative part of the study. The qualitative data were obtained from multiple data sources, including semi-structured interviews with teachers, video-recorded and fully transcribed six weeks of PLC meetings, observations, and researcher field notes.

3.1.2. Quantitative Part of Study

The quantitative part aimed to explore how a DBDM-PD program affects students' HrF knowledge and physical activity level. A Quasi-Experimental Design (pre- and post-test) among Between-Group Designs (Figure 3.2) was used to examine the students learning in the current study (Creswell, 2012). Quasi-experimental designs are those in which the researcher has only little (or no) control over how participants

are randomly assigned to levels of a manipulated variable of interest (Creswell & Creswell, 2018). Therefore, random assignment method was not used to select the students to the experimental or control groups. All students in groups completed pre and post-tests measuring HrF knowledge and physical activity level but only teachers in experimental group attended the intervention. The intervention of this study was six weeks of PLC meetings. Quantitative data were collected before and after the intervention via a knowledge test and a questionnaire by the researcher.

Experimental Group	**Pretest**	**Experimental Treatment**	**Posttest**
Control Group	**Pretest**	**No Treatment**	**Posttest**

Figure 3. 2. Quasi-experimental between-group design (Creswell, 2008).

3.2. Sampling and Participants

The study was carried out in the province of Ankara, Turkey. Fourteen secondary school physical education teachers (five females, nine males) and their students were invited to this study. The teachers were teaching in four districts of Ankara, including Etimesgut, Sincan, Yenimahalle, and Çankaya. The inclusion criteria of teachers in the study were the type of school (public versus private), teaching 7th grades, and teaching in a district of Ankara.

Purposeful sampling method was used to choose participants. The method assumes that a researcher intends to find, understand, and yield insights and for that reason, must choose a sample that allows for the most learning (Merriam & Tisdell, 2016). The participants of this study were selected in Ankara, which allows ease for participants to get together frequently for PLC meetings. Patton (2015) argues that "*the logic and power of purposeful sampling lies in selecting information-rich cases for in-depth study. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry"* (p. 401).

The study started with 14 teachers and their students, but then two teachers left the study. Therefore, the participants of present study were 12 physical education teachers (six in the experimental group and six in the control group) and their 331 seventh-grade students (167 in experimental group and 164 in the control group). Only teachers in experimental group were included in the six weeks PLC meetings.

3.2.1. Experimental Group

The study began with seven teachers (3 female, 4 male) who volunteered to get involved in the experimental group and to participate for six weeks in the PLC. However, in the 4th week of the PLC meetings, a female teacher left the study because of personal reasons. The study was completed with the experimental group's remaining six teachers (2 female, 4 male). The teachers came together for PLC meetings once a week for six weeks. After the PLC meetings, teachers were asked/expected to reflect on their learning in their classes for the next six weeks.

The teachers' demographic information is summarized in Table 3.1. Their ages varied between 35-51 years, and they had 10 to 16 years of physical education teaching experience. Teacher 3 who had a total of 25 years of teaching experience had passed from classroom teaching to physical education teaching. Four of the teachers had bachelor's degrees, one of them had a master's degree in Sport Sciences, and the other of them had a Ph.D. degree in Sport Sciences. Experimental group teachers were asked to participate in the study with one of the 7th graders they taught throughout the study process. Teachers continued their regular classess during the study, and no intervention was made in their lessons content and practices by the researcher. Their class sizes ranged from 18 to 33 students, totaling 167 students (see Table 3.2). All students in the experimental group participated in the study voluntarily.

3.2.2. Control Group

Seven teachers (2 female, 5 male) volunteered to attend in the control group in this study. A teacher in the control group left the study. The study was completed with six teachers in the control group (1 female, 5 male) and their students. The teachers were

informed about the study and maintained their regular classes throughout the study like experimental group teachers. They did not participate in PLC meetings. Control group teachers' one of the 7th grades they taught during the study were selected. There was a total of 164 students in the control groups. Their class sizes ranged from 20-31 students (see Table 3.2). All students in the control group participated in the study voluntarily.

Table 3. 1. Demographics of teachers in the experimental group

Teachers	**Gender**	**Age**	**Experience**	**Education**	**District**
Teacher 1	Female	43	16 years	Bachelor	Etimesgut
Teacher 2	Female	35	12 years	Masters	Sincan
Teacher 3	Male	51	10 years	Bachelor	Çankaya
Teacher 4	Male	43	15 years	PhD	Yenimahalle
Teacher 5	Male	36	12 years	Bachelor	Etimesgut
Teacher 6	Male	38	10 years	Bachelor	Etimesgut

In addition, it was taken into consideration that the experimental and their control schools were located in the same district and had similar physical infrastructures (gymnasium and playground).

Table 3. 2. Class sizes of schools

Experimental schools	**Class size**	**Control schools**	**Class size**
Experiment1	29	Control1	27
Experiment2	26	Control2	27
Experiment3*	30	Control3*	30
Experiment4	31	Control4	20
Experiment5*	33	Control5*	31
Experiment6	18	Control6	29
Total	167	**Total**	164

*There was a gymnasium in these schools.

3.2.3. The Facilitator

The facilitator of the PLC meetings was a senior faculty member in the Department of Physical Education and Sport at a public university. He was 53 years old while the study was conducted and had 26 years of teaching experience. After graduating from

university, he worked as a secondary school physical education and sports teacher for one year. The facilitator has a Ph.D. degree in educational sciences and specializes in curriculum and instructional design. The facilitator worked as a consultant in the design of the secondary school curricula in Turkey. He also facilitated several PLCs' previously (Hunuk, 2013; Kılıç, 2019; Mehrtash, 2020; Ince et al., 2020).

3.3. The Intervention

The intervention is designed to improve teachers' data use for increasing student performance. The PLC meetings were held at a local university's physical education and sports laboratory that equipped audio-visual educational technologies for six weeks. The participants of the meetings were six physical education teachers in the experimental group, a facilitator, a data processing expert, and a researcher (myself). The weekly meetings were scheduled according to the suitable days and hours of the participants and lasted between 1.5-2 hours.

The program's content was created according to the experimental group teachers' need assessment before the intervention (Research question 1) and literature (Mandinach, 2012). The knowledge and skills of teachers, their instructional practices and the regulations in their schools regarding data use were evaluated, and included in the discussions. The focus of the first two meetings was to raise awareness about why data use important in physical education (accountability, school development, and instruction), which factors affect the data use (characteristics of data, data user, and school organization), which data have to be collected/produced in physical education, and how these data can be transformed from information to knowledge for instructional decisions. Discussions revolved around curriculum, students' learning needs (HrF, HrF knowledge, physical activity), measurement & evaluation, use of technology for assessment, content knowledge, and pedagogical content knowledge in physical education. Teachers were provided resources such as physical education and sports curriculum, health-related physical fitness report application guide, and evaluation protocols of data collection tools. In the second meeting, the teachers reviewed the data collection tools (knowledge test and physical activity questionnaire) with the facilitator and manually analyzed their students' data on a sample test and

questionnaire. After the meeting, teachers were asked to manually process the data of HrF knowledge and physical activity of all their students. The third and fourth meetings were about using technology for measurement & evaluation. Teachers practiced in Microsoft Excel with an expert who was a research assistant and a Ph.D. student in the Computer Education and Instructional Technology department. The researcher supported teachers who needed equipment (laptop, tablet) for data processing during the study. The teachers first worked on data tables (templates) in Microsoft Excel created by the researcher to organize their students' data. Afterwards, the teachers practiced on entering and coding the data they had manually processed, analyzing data (frequency, sum, mean, percentage, formula creation), sorting and grouping in Microsoft Excel (see Appendix A). Finally, the teachers visualized data via graphs and interpreted the data (see Appendix B). In short, teachers used technology to organize, analyze, interpret, and report their students' data for two weeks. The fifth meeting targeted teachers' experience with Microsoft Excel. They identified their student's learning needs (HrF, HrF knowledge, physical activity level) accordingly to the results of their analysis and discussed setting learning goals and developing pedagogical strategies. Various educational games and activity books, videos, presentations about teaching methods and measurement-evaluation in physical education, and summary HrF information were presented to the teachers for using in their instructions. The last meeting was organized after the six-week implementation and revolved around teachers' reflections on their professional learning and instructional practices about HrF, HrF knowledge, and physical activity participation. It ended with a general evaluation of the program and free discussions on physical education. All of the sessions were video-recorded and then transcribed verbatim. The overall content of the DBDM-PD program is summarized in Table 3.3.

3.4. Data Collection Instruments

Data collection instruments were utilized for both qualitative and quantitative methodologies in the study. Qualitative data were gathered through semi-structured interviews, observation, field notes, and video-recorded meetings; quantitative data were collected via a knowledge test and a questionnaire. The study's research questions and related data collection tools were presented in Table 3.4.

Table 3. 3. The overall content of the DBDM-PD program by weeks

Weeks	Topic
1	• Introduction to the aims of the DBDM-PD program • Discussion on the DBDM Collect, organize, analyze, summarize, synthesize, prioritize • Discussion on data use in physical education (collect) HrF, HrF knowledge, Physical activity participation • Discussion on measurement & evaluation of HrF
2	• Overview of the previous week • Discussion on data use in physical education (organize, analyze) • Discussion on measurement & evaluation of physical activity participation and HrF knowledge
3	• Overview of the previous weeks • Use of technology for measurement & evaluation in PE Microsoft Excel practices (organizing and analyzing data)
4	• Overview of previous weeks • Use of technology for measurement & evaluation in PE Microsoft Excel practices (summarizing of data)
5	• Overview of previous weeks • Reflection on Microsoft Excel Practices • Discussion on individual/group diagnosis of students' learning needs (synthesizing and prioritizing of data) HrF, HrF knowledge, physical activity participation • Goal setting and developing pedagogical strategies
6	• Overview of the DBDM-PD program • Reflection on professional learnings and instructional practices of teachers HrF, HrF knowledge, physical activity participation • General evaluation of the program • Free discussions on physical education

3.4.1. Quantitative Data Collection Instruments

For the quantitative part of the study, data were collected with a HrF knowledge test, and a physical activity participation questionnaire. Detailed explanations were given below for each data collection instrument.

3.4.1.1. Health–Related Fitness Knowledge Test for Middle School Students

The HrF Knowledge Test for Middle School Students was used to measure the students'knowledge levels on HrF (Ince & Hunuk, 2013). The test is an adapted

version of the "Superkids-Superfit Knowledge Test" developed by Mott et al. (1991). The Turkish version of the test was validated in various studies by Hunuk and Ince (2010).

Table 3. 4. Research questions and related data collection instruments

Research Questions	Data Collection Instruments
RQ. 1. What are the practices and needs of physical education teachers with respect to data use? **1a.** Which factors influence the data use of physical education teachers? **1b.** For which purposes are data being used by physical education teachers?	- Semi-structured interview
RQ. 2. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices, and their students' HrF knowledge and physical activity level? **2a.** How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices? **2b.** How do teachers' participation in the DBDM-PD program structured as a PLC affect their students' HrF knowledge and physical activity level?	- Semi-structured interview - Video-recorded six-weeks PLC - Observation - Field notes - HrF Knowledge Test - PAQ-C
RQ. 3. What are the teachers' views on design, implementation and outcome the DBDM-PD program?	- Semi-structured interview

The original test contains 25 items, but 11 items were added to the Turkish version. A 36-item multiple-choice paper-pencil test as a final version was utilized for the present study (see Appendix C). The questions were adapted according to Turkish physical education standards of the secondary school curriculum for HrF knowledge. Each question of the test is evaluated as one point. Therefore, maximum score that can be obtained from the test was 36 points. Iteman analysis was employed to examine items and test-level for construct validity. The Iteman analysis results found that item difficulty values were between 0.24 and 0.90, with a p-value of 0.60 on average, and discrimination values were between 0.04 and 0.54 (Hunuk & Ince, 2010). The

questionnaire' reliability value was found 0.68 which is an acceptable value (Nunnally, 1972). These results demonstrate that the test is a valid measure of conceptual HrF knowledge of Turkish secondary school students.

3.4.1.2. The Physical Activity Questionnaire for Older Children (PAQ-C)

The PAQ-C was developed to evaluate children' physical activity levels by Kowalski et al. (2004). The questionnaire was adapted to Turkish and validated by Erdim et al. (2019). The Turkish version of PAQ-C was utilized in this study (see Appendix D). It is a self-reported, seven-day recall instrument that is low in cost, time efficient, and easy to administer to large populations (Kowalski et al. 2004).

The PAQ-C comprises 10 items that students will answer considering their physical activities in the past seven days. Nine of the items are used to calculate physical activity scores, but item 10, which informs about the sickness or other excuses of the students, is not included in the scoring. Item 1 is a kind of activity checklist that contains 14 prevalent leisure time and sports activities and options of "other." It provides information about the physical activity preferences of students. Items two to seven are related to an assessment of physical activities carried out during the day or at particular times during the week (physical education lesson, recess, lunch, right after school, evening, and weekends). The remaining items give information about the physical activity frequency of the students and the physical activity frequency for each day of the week, respectively.

Except for item 10, each item is scored on a 5-point scale and has an activity score between 1-5, and higher scores represent a higher physical activity level. The overall PAQ-C score is obtained by taking the mean of these nine items' scores. A score of one point out a low physical activity level, while a score of five shows a high physical activity level. If the students mark item 10 as yes (indicating a condition that affects their participation in physical activity), the questionnaire is considered invalid. The construct validity of the Turkish version of the questionnaire revealed that the item's internal consistency was 0.77, and the test-retest correlation was 0.91 (Erdim et al., 2019).

3.4.2. Qualitative Data Collection Instruments

In the qualitative part of the study, the researcher used interviews, observation, field notes, and video-recorded PLC meetings as data collection instruments. Each instrument is described below, respectively.

3.4.2.1. Interview

An interview is a data collection method for discovering "*data on understanding, opinions, what people remember doing, attitudes, feelings and the like, that people have in common*" (Arksey & Knight, 1999, p. 3). Interviewing is the most common qualitative data collection method and an integral part of most research disciplines (Savin-Baden & Howell-Major, 2013). A semi-structured interview type was used in this study. The researcher followed some preset questions and included additional questions in response to participant comments and reactions (Savin-Baden & Howell-Major, 2013).

All interviews were conducted face to face and by the researcher. At the beginning of the study, semi-structured interviews were conducted with six teachers in the experimental group for needs assessment about the data use in physical education (see Appendix E). These teachers were interviewed for the second time after the intervention. The duration between the intervention and the second interviews was six weeks (implementation weeks), which gave teachers time to apply what they learned from the intervention in their lessons. The purpose of the second semi-structured interviews was to (1) understand teachers' views and thoughts on the DBDM-PD program and (2) examine their data use skills, knowledge, and instructional practice after the DBDM-PD program

The interview protocol consisted of eight open-ended questions that aligned with the research questions prepared by the researcher (Creswell, 2012). The questions were checked and edited by two experts experienced in qualitative research in physical education (see Appendix F). Each interview was held in teachers' schools and lasted between 25 and 125 minutes. All the interviews were audio-recorded via a digital voice

recorder with the participants' permission. Also, the researcher took brief notes while interviewing to draw attention to important topics.

3.4.2.2. Observation

Observation is defined by Marshall and Rossman (2016) as "the systematic description of events, behaviors, and artifacts in a social setting chosen for study" (p. 278). It is collecting open-ended, firsthand knowledge by observing people and settings at a research site (Merriam & Tisdell, 2016). The primary aim of observational data is to define in depth and in detail the observed environment, the activities taking place in that environment, the people involved in those activities, and the meanings of what is observed from the perspective of the observed (Patton, 2002). The researcher, as a non-participant observer who visits a location and takes notes without getting involved in the activities of the participants (Cresswell, 2012), observed one of the physical education classes of the teachers in the experimental group during the implementation weeks. The purpose of the observation was to examine how teachers designed and practice lessons based on the data gathered from their students (HrF knowledge, physical activity participation) after the intervention. An observation form was prepared and used to record information while observing (see Appendix G).

3.4.2.3. Field notes

Field notes are text entries made by the researcher while conducting an observation (Cresswell, 2012). They include a summary of what was seen and anything the observer thought was noteworthy (Patton, 2002). Although field notes might take many various forms, they are always accompanied by observer statements, direct quotations, and explanations (Merriam & Tisdell, 2016).

As a non-participant observer, the researcher collected field notes from the six weeks of PLC meetings and the school settings of experimental group teachers in the present study (Creswell, 2012). The field notes contained the setting characteristics of the meetings (place, participants, time, materials), the topics discussed, and emerging themes on data use during PLC meetings. They also included the teachers'

instructional practices, behaviors of teachers and students during lesson observations, and the researcher's reflections on any activities throughout PLC weeks. The field notes contributed to a better understanding of how teachers' awareness of data use in physical education increased and how this was reflected in their practices. They also supported the interview results. A field note example taken by the researcher was attached to Appendix H.

3.4.2.4. Video-Recorded Six-Weeks PLC Meetings

The video-audio records of the six weeks of PLC meetings were fundamental data sources for the current study. The researcher got permission from the participants for the recordings, and it was reminded that the recording was taken before each meeting. The primary purpose of the video recordings of PLC meetings was to understand teachers' experiences in the DBDM-PD program in which the facilitator and physical education teachers interact. In addition, video recordings were taken to examine the DBDM-PD program in detail and to set an example for future programs to be designed in terms of content and implementation. All of the video-recorded data were transcribed for analysis.

3.5. Data Collection Procedure

3.5.1. Ethical Procedure

This study was carried out in the fall semester of the 2021-2022 academic year and lasted 16 weeks. Prior to the study, approval of the Human Research Ethical Committee of Middle East Technical University (see Appendix I) and legal permissions were obtained from the MoNE (see Appendix J).

The researcher contacted the school administrators of the teachers selected for the study to inform them about the study, and to get permission to collect data. Written consent was acquired from the teachers and students participating in the study (see Appendix K and L) and students' families (see Appendix M). The participants were informed about all aspects of the measurement protocol. The researcher kept

confidential the participants' names and any information related to them because of ethical issues.

3.5.2. Data Collection

The purpose of the study was to design a DBDM-PD intervention for physical education teachers and investigate this intervention's effect on the teachers' data use, instructional practices, and their students' learning, furthermore, to understand views and thoughts of teachers on the DBDM-PD. The "Active Participation and Healthy Life" sub-learning area of the Turkish Primary Physical Education Curriculum was chosen as a research subject for examining learning of students. The study consists of four stages and data were collected by various data collection instruments at each stage. The stages of study were (1) a needs assessment and data collection, (2) intervention, (3) implementation, (4) data collection, and continued for 16 weeks (see Figure 3.3).

In the first stage of the study (a needs assessment and data collection), semi-structured interviews were conducted with the teachers in the experimental group for needs assessment about their data use knowledge and skills, and instructional practices. In addition, pre-tests were conducted using the "Health-Related Fitness Knowledge Test for Middle School Students" and "Physical Activity Questionnaire for Children" to determine the HrF knowledge level and physical activity level of all students. Data from students were gathered by their teachers as a part of the intervention.

In the second stage (intervention), the teachers in the experimental group attended meetings with a facilitator once a week for an average of 1.5-2 hours for six weeks. The meetings were held in a research laboratory at the METU, Faculty of Education, Department of Physical Education and Sports. The researcher video/audio-recorded each meeting for later analysis after receiving permission from the participants. In addition, informal group and individual meetings were held to support teachers for data analyzing, graphical representations of data and interpreating in Microsoft Excel program by the researcher. The researcher took field notes during this stage.

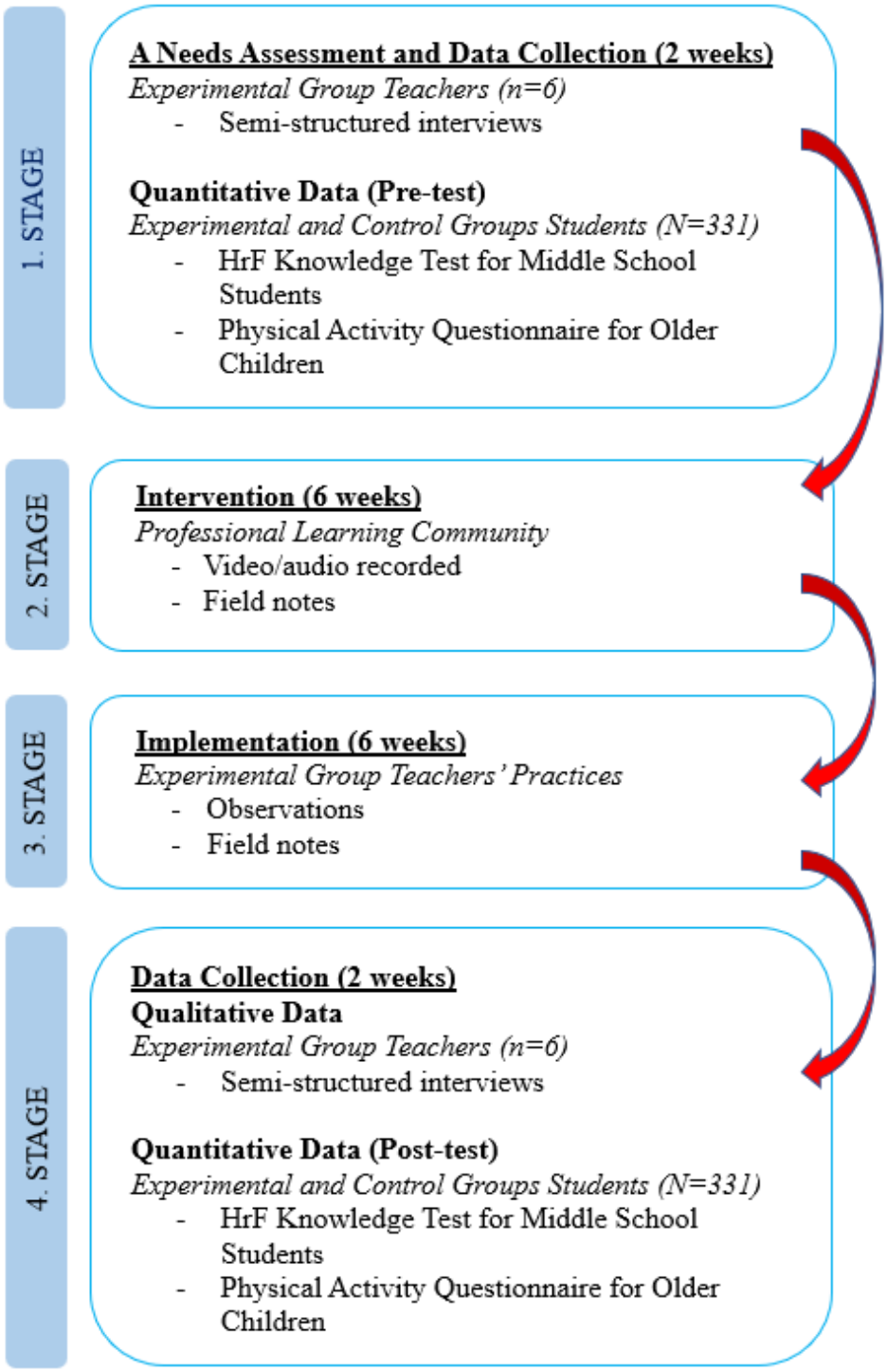


Figure 3. 3. Overall design of the study and data collection methods

In the third stage (implementation), the teachers were expected to design and apply their lessons based on their students' data. Teachers were provided with various educational resources that they could use in their lessons. The researcher came together with each teacher independently in their own school and observed one of their physical

education and sports lessons of them. Field notes were taken throughout this process by the researcher.

In the fourth stage of the study, semi-structured interviews were performed with the experimental group teachers to investigate the intervention's effect on data use and teaching practices, and to evaluate the overall DBDM-PD program. All interviews were recorded digitally with participants' permission and transcribed verbatim for the analysis. The HrF knowledge test and PAQ-C were re-administered to all students by their teachers as a post-test.

3.6. Data Analysis

Both qualitative and quantitative data analysis methods were performed in the current study. Each of them is described below.

3.6.1. Qualitative Data Analysis

Semi-structured interviews before the intervention were analyzed to identify the needs of physical education teachers on DBDM using content analysis (RQ. 1). The constant comparative method of data analysis (Glaser & Strauss, 1967) was used to analyze semi-structured interviews with teachers after intervention, lesson observations, researcher field notes, and fully transcribed six weeks of PLC meetings (RQ. 2a). In addition, content analysis was utilized to examine teachers' evaluations of the professional development program designed for them (RQ. 3).

For the qualitative data coding and analysis, the four stages involving microanalysis, open coding, axial coding, and selective coding were used in this study (Strauss & Corbin, 1998). The initial stage was microanalysis, transcribed data were examined a line-by-line to generate initial codes. The second stage was open coding, it was used to identify the data by dividing them into manageable units, labeling ideas, and generating codes (Strauss & Corbin, 1998). The software MaxQDA 22 was utilized to assist in the open coding process for this study. It is one of the data analysis programs for qualitative data that stores, sorts, and retrieves the data (Meriam & Tisdell, 2016).

The researcher created initial codes from each data source and labeled them related to the basic idea of the data. Labeling codes aimed to group similar statements under widespread and meaningful categories. After codes were accumulated, they were organized and categorized to seek the patterns within them. The third stage was axial coding including "*a set of procedure whereby data are put back together in new ways after open coding, by making connections between categories*" (Saven-Baden & Major, 2013, p. 424). In this stage, emerged codes depending relationships between concepts and subconcepts were grouped and labeled as categories according to the research questions. Categorizing allowed the researcher to decrease, combine and integrate the number of codes into more easy-to-control groups (Strauss & Corbin, 1998). Finally, selective coding provided the researcher to convert codes and categories into themes that reflect the content of each data source. According to Savin-Baden and Major (2013), finding themes, defines as a unifying or strongest idea in the data, is the core of the data analysis process. This analysis stage focused on combining the related themes to examine how the intervention affects physical education teachers' data use knowledge and skills, and instructional practices.

3.6.1.1. Trustworthiness of Data

In a qualitative investigation, the terms credibility, transferability, dependability, and confirmability -collectively known as trustworthines- replace validity and reliability, respectively (Lincoln & Guba, 1985). These concepts are discussed in this section in light of how the study dealt with them.

Credibility, which is related to internal validity, is a term that describes the suitability of methods as well as the correctness of conclusions and data (Anney, 2014). In other words, it concerns how closely the study's findings accord with reality (Merriam, 2009). In the current study, triangulation was used to establish credibility (Lincoln & Guba, 1985; Merriam, 2009). Data triangulation (the use of several data sources in a study) and methodological triangulation (the use of multiple methods in a study) were employed to ensure validating findings (Patton, 2015). This study used data gathered from individual interviews, observations, field notes, video recordings of PLC meetings, HrF test, and physical activity survey.

Transferability, which is associated with external validity, describes how well the findings can be used in other contexts, in practice, in theory, or in subsequent study (Merriam, 2009). To ensure transferability for this research, thick descriptions of the research method such as participants, settings, data collection instruments, procedures, intervention, and study findings were explained comprehensively (Merriam, 2009).

Confirmability, which is associated with internal reliability, describes the extent to which conclusions drawn from research or participant answers are consistent with and substantiate the data (Connolly, 2016). In other words, refers to the consistency in the study (Merriam, 2009). For this study, data collection and data analysis procedures are explained and, technical details are defined to conserve confirmability (Merriam, 2009).

Dependability (which is related to reliability) refers to how closely a study may be replicated by other researchers and produce the same findings and reactions (Lincoln & Guba, 1985). It can be defined the consistency between the data and the inferences drawn from the data (Merriam, 2009). Peer debriefing, triangulation, and member checking were attained in current study. Peer debriefing was carried out by the facilitator to confirm the reseracher' findings and make sure the data validity (Patton, 2002). For member checking, participants were asked to identify misinterpretations and explanations in the interview transcripts (Creswell, 2009). Nobody in the group asked for modifications.

3.6.2. Quantitative Data Analysis

Descriptive and inferential statistics were conducted to examine the HrF knowledge and physical activity levels of the students (RQ. 2b). Descriptive statistics were utilized for all variables and summarized as means and standard deviations. Repeated measures ANOVA was conducted to analyze the differences between the pretest and posttest results of students' HrF knowledge and physical activity level ($p < .05$).

Before applying any inferential analysis, assumptions for univariate analysis were checked (Field, 2009). The Statistical Package for Social Sciences version 26 was used for all analyses.

3.7. Researcher's Role

As a researcher, I was responsible for identifying the participants, gaining appropriate permission from all stakeholders, organizing the PLC meetings, implementing the pre and post-test for students, and analyzing these quantitative data. Before the study, I communicated with the teachers individually and introduced myself. I informed them in detail about the purpose, content, and process of the study and invited them to it. I also set up a WhatsApp group with teachers to increase communication between them and share necessary information. My role as the researcher in this study was to design the professional development program, collecting data via interviews, observations, field notes, HrF knowledge test, and physical activity questionnaire before, during, and after the intervention, and then organize data and analyze them. In the PLC meetings, my duties as a non-participant observer were assisting the facilitator, videotaping the discussions, taking notes, and ensuring a comfortable meeting setting.

3.8. Limitations

This study was conducted during the Covid-19 pandemic period. The study was carried out in the province of Ankara and included 7th grade teachers from Sincan, Etimesgut, Çankaya, and Yenimahalle districts. This study focuses on the DBDM in the "Active and Healthy Life" learning domain in the Secondary School Physical Education and Sports Curriculum.

CHAPTER 4

RESULTS

This chapter includes the findings for each research question.

4.1. Research Question 1

RQ. 1. What are the practices and needs of physical education teachers with respect to data use?

RQ.1a. Which factors influence the data use of physical education teachers?

RQ.1b. For which purposes are data being used by physical education teachers?

A needs assessment was conducted at the beginning of the study and the first research question was formed for this purpose. It aims to understand the factors affecting teachers' data use and their data use purposes, and to design the professional development program accordingly. Qualitative data were collected through semi-structured interviews before the intervention and analyzed using content analysis. The conceptual framework developed by Schildkamp et al., (2017) was used to identify the themes (see Figure 4.1).

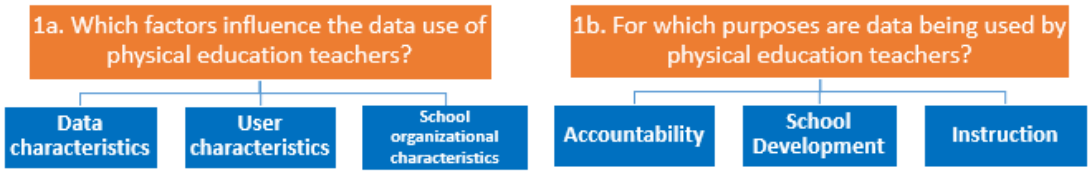


Figure 4. 1. Themes for research question 1 (adapted from Schildkamp et al., 2017)

RQ. 1a. Which factors influence the data use of physical education teachers?

Qualitative findings for research question 1a revealed that data characteristics, user characteristics, and school organizational characteristics affect physical education teachers' data use.

Data characteristics: Physical education teachers have access to data on their students, including identity information, contact information (phone number, address, e-mail), parent information (married, single, dead), class, school number, course grades, behavior grades, attendance, socio-economic status (parent income, number of siblings), and HrF parameters (height, weight, BMI, push-ups, sit up, flexibility). These data are accessed through the e-school management information system. However, this system is not actively used by teachers for physical education lessons. Teacher 5 expressed that *"We do not use e-school system actively in this sense, to tell the truth of the matter"-"İşin aslını söylemek gerekirse e-okul sistemini bu anlamda aktif olarak kullanmıyoruz."*

Teachers collect only HrF data from their students in the physical education lesson. In Turkey, HrF data was initially collected in 2016-2017 academic year in collaboration with the MoNH and the MoNE to encourage physical activity and to raise awareness of healthy nutrition and physical activity in students (Parsak & Saraç, 2021). Therefore, physical education teachers were requested to measure the students' HrF parameters on specific dates, twice an academic year, and to enter the obtained data into the e-school system (MoNE, 2018). However, it is understood that the teachers did not receive any training on these measurements, only training videos were prepared but not sufficiently disseminated, and the authorities did not provide material support to schools for the measurement. Teachers believe there were problems with the HrF data collection protocol; therefore, they think the HrF data is not reliable and accurate in making instructional decisions. Teachers articulated that;

> *Teacher 1: We cannot trust that data. I do this in an ideal, statutory manner but there are teachers in many schools not doing so, we know that. They do not take it seriously. Öğretmen 1: O verilere güvenemeyiz. Ben bunu ideal nizami yapıyorum ama birçok okulda yapmayan öğretmenler var, biliyoruz. Ciddi yapmayanlar var.*

Teacher 2: The reliability is debatable when you look at it has a whole (in total). Because the measurement methods differ from one teacher to another. For instance, some may abide by the rules and follow according to the guide, and others don't. So, it can be subjective.

Öğretmen 2: Totalde bakıldığında güvenilirliği tartışılır. Çünkü ölçüm yöntemleri öğretmenden öğretmene değişebiliyor. Yani kimi belki tüm kurallara uygun, kılavuza uygun şekilde yapabiliyor, kimileri yapamıyor. Yani…O biraz göreceli olabilir.

Data user characteristics: Teachers do not know for what purpose they collect HrF data and how to use them because teachers only collect these data and enter them into the e-school management system. HrF data collected by teachers are automatically evaluated in this system and presented to students individually though the system. Teachers stated that;

Teacher 6: The first thing the students asked was 'teacher, why are we doing this? I don't have the answer, as I also don't know why I am doing it…

Öğretmen 6: Öğrencinin ilk bunu yapmaya başladığımızda sorduğu şey hocam biz bunu neden yapıyoruz? Cevap bende yok, hani neden yaptığımı bilmiyorum ki ben…

Teacher 5: We enter this data into the e-okul system. Other than that, we actually do not use it in any way. Look (now), to tell the truth (in the reality of the situation), we the physical education teachers don't quite understand the reason in doing the HrF tests. We are only doing it, yes, it must be done in the beginning and at the end of the year, but we don't know what to the in (between) the period.

Öğretmen 5: Biz bu verileri e-okul sistemine giriyoruz. Onun dışında açıkçası herhangi bir şekilde kullandığımız yok. Şimdi biz işin gerçeği bu fiziksel uygunluk testlerinin yapılış amacını henüz tam olarak beden eğitimi öğretmenleri kavrayamadılar. Sadece yapıyoruz evet, bildiğim kadarıyla yıl başında ve yıl sonunda yapılması gereken ölçümler ama bu aradaki süreçte neler yapılacağını bilmiyoruz.

Teacher 3: We didn't understand why it was made. In a way, I think that I enter this into the system so that these two ministries, that is the Ministry of Health, there is a department for that, maybe they will inspect and give us feedback.

Öğretmen 3: Biz onun ne için yapıldığını anlamadık. Yani ben şöyle zannediyordum. Ben bunu sisteme giriyorum hani bu iki bakanlık işte Sağlık Bakanlığı herhalde bir merci var herhalde onlar denetleyecek ve bize dönüş sağlayacaklar.

Teacher 4:We measure but we don't know what kind of basis for evaluation it represents for the Ministry of Health and Sports or the Ministry of National Education. The government, as I presume, is seeking physical capacity, obesity state, the strength state of the Turkish youth with these measurements. It sees [these measurements] but we don't know what it does [with this data] afterwards.

Öğretmen 4:Her sene ölçüyoruz ama bunun Milli Eğitim Bakanlığı nezdinde Spor Sağlık Bakanlığı nezdinde nasıl bir değerlendirmeye temel teşkil ettiğini biz bilmiyoruz. Devlet sanıyorum bu ölçümle Türk gençliğinin fiziksel kapasitesini,

obezite durumunu, kuvvet durumunu görmek istiyor. Görüyor ama gördükten sonra ne yapıyor biz bunu bilmiyoruz.

In addition, teachers were asked how they evaluated themselves regarding the use of data (collecting, analyzing, interpreting, reporting, and visualizing). Teachers consider themselves competent in collecting data relating to HrF parameters and do not experience any problems in the data collection process. Regarding the use of educational technology (Microsoft Excel), most of the teachers think that they have the relevant skills. However, it is understood that they did not need to analyze, interpret and visualize the data to use in the lessons until the DBDM intervention. Therefore, they did not have any experience in the data use process other than data collection. Teachers stated that;

Teacher 1: I am really bad at technology, and really bad at computers. I don't have that thing, like I should make a list or fix this. I don't have that.

Öğretmen 1: Teknolojide çok kötüyüm, bilgisayarda çok kötüyüm. Şeyim yok yani öyle listeleme yapayım, şurayı düzeltiyim hiç yok.

Teacher 2: So, it is not something I have tried. I didn't try [it]. I can conclude from the data but I may have problems in the analysis part.

Öğretmen 2: Yani denediğim bir şey değil açıkçası. Denemedim. Verileri yorumlayabilirim fakat analiz kısmında problem yaşayabilirim.

Teacher 4: I don't have any experience in making graphics, really. As also, there wasn't a need for it [either]. We enter this [data] to the e-okul system therefore, we enter a ready-made table. Since there was not a need for it I wasn't really curious to open and see how it is made.

Öğretmen 4: Bir grafikleme yapma konusunda bir deneyimim yok açıkçası. Dolayısıyla buna ihtiyaç da olmadı. Biz bunu e-okul sistemine doğrudan girdiğimiz için hazır bir tabloya giriyoruz. İhtiyaç olmayınca da açıkçası bende merak edip de nasıl yapılır diye ilgilenmedim.

Teacher 6: I can do many things in Excel but there are things that regular Excel users can do but the means, medians, percentages and such that I cannot do.

Öğretmen 6: Excel'de birçok şeyi yapabiliyorum ama normal bir Excel kullanıcısının yapabileceği şeyler ama bu ortalamalar, medyan, yüzdelikler falan onları yapmıyorum.

Looking at the school organizational characteristics, it is understood that there is limited regulations and practices regarding using data for physical education and sports lessons in schools. In this context, there is no common vision, norm, or cooperation among educators. There is also no data expert in schools to support educators' data

use. School principals have few incentives or expectations regarding data use in physical education lessons. They only expect physical education teachers to collect HrF data and enter them into the e-school system for accountability purposes. Teacher 4 expressed that *"We do not have any regulations in order to use data usage special to our subject (branch) in our school and I don't know whether they have [it] in other schools"-"Branşımıza özgü veri kullanımı ile ilgili düzenlemeler bizim okulumuzda yok da başka okullarda varsa da benim haberim yok."* Other teachers also confirmed this statement.

RQ. 1b. For which purposes are data being used by physical education teachers?

Qualitative findings for research question 1b indicated that physical education teachers use data only for accountability purposes, not for instructional purposes such as identifying students' learning needs, designing lessons, and monitoring students' progress. Teachers collect only HrF data from their students for accountability purposes in physical education lessons to school principals, apart from subject-related assessment data. Since HrF data are collected obligatory, it is understood that school principals are interested in entering these data into the e-school system at the relevant times, but they are not interested in the results of this data. Teachers pointed it out in this way;

> *Teacher 1: Administrators send the official writings (about the application of HrF) when they arrive and tell do this. Do it in plentitude.*
>
> *Öğretmen 1: İdareciler yazı (SİFU uygulanması hakkında) geldiği zaman hemen gönderiyor, bunu yapın diyor. Bunu eksiksiz yapın.*
>
> *Teacher 6: Do you know how it is solely? Ok friends, the official writings have arrived, enter this information as soon as possible.*
>
> *Öğretmen 6: Sadece olay nasıl biliyor musunuz? Arkadaşlar yazı geldi, bu bilgileri bir an evvel girin.*

While the data can be used for school development purposes such as determining school's student achievement, annual school goals, and teachers' professional development needs, it was stated that school principals are only interested in data related to school teams (number of medals, cups, licensed athletes, sports branch, competitions). Teachers statements are as follows:

Teacher 5: They only want reports about the sports activities happening in school. So, that many students have attended the courses, this much success has been achieved…We talk about these.

Öğretmen 5: Biz sadece okulda gerçekleştirilen sportif aktivitelerle ilgili bizden rapor isteniyor. İşte şu kadar öğrencimiz kurslara katıldı, şu kadar başarı sağlandı… Bunları konuşuyoruz.

Teacher 1: We explain the team sports' success in that year in the meetings. So, we don't talk about any of the development of the children, really. School success, team medals [that are earned], we did this here, we tell these.

Öğretmen 1: Toplantılarda o yıl ki takım sporlarının başarılarını söylüyoruz. Yani çocukların gelişimi ile ilgili hiçbir şey konuşmuyoruz açıkçası. Okul başarıları, takım madalyalar, şunda şunu yaptık, onları anlatıyoruz.

Teacher 4: In the end-tear meetings, we talk about the activities. We explain the gradation, if we have, in those meetings. Even if we have no gradation we say that we attended competitions in city or district wise, such branches. We have this many licensed athletes that year, we say. A general statement.

Öğretmen 4: Yıl sonu toplantılarında o yıl ki faaliyetlerden bahsederiz. Takım sporlarında yaptığımız derece varsa onu ifade ederiz. Derece olmasa bile şu branşlarda ilçe il genelinde yarışmalara katıldık deriz. Şu kadar lisanslı sporcumuz oldu bu sene deriz. Genel bir bilanço.

4.2. Research Question 2

RQ. 2. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices, and their students' HrF knowledge and physical activity level?

RQ. 2a. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices?

RQ. 2b. How do teachers' participation in the DBDM-PD program structured as a PLC affect their students' HrF knowledge and physical activity level?

The second research question focused on how a DBDM-PD program structured as a PLC affects a) teachers' data use and instructional practices and b) their students' HrF knowledge and physical activity levels.

RQ. 2a. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices?

Semi-structured interviews, lesson observations, researcher field notes, and the six weeks of PLC meetings were analyzed to understand the affect of the PD program on physical education teachers' data use skills and knowledge and teaching practices. Data were coded using MAXQDA through a constant comparative process. The findings revealed two main themes for answering this research question: 1) The learning of teachers from the DBDM-PD program, and 2) The instructional practices of teachers relating DBDM. These themes are explained in the following subsections (see Figure 4.2).

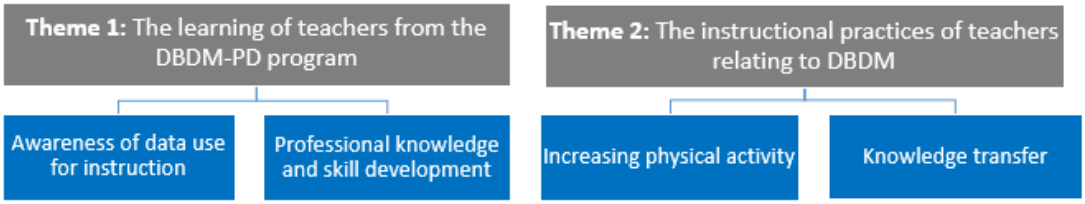


Figure 4. 2. Themes for research question 2a

Theme 1: *The learning of teachers from the DBDM-PD program*

Two categories emerged for this theme: 1) Awareness of data use for instruction (determining the students' needs, getting to know students, awareness and motivation of students) and 2) Professional knowledge and skill development (content knowledge and measurement and evaluation).

According to needs assessment, the teachers were not knowledgeable regarding DBDM and were not collecting any data from their students for instructional purposes before the intervention. Teachers were using the data for assessment of the knowledge and skills of their students in specific subject matters. They collect various physical fitness data, but they do not know how and for what purpose they are used. In this direction, in the 1st and 2nd weeks of the PLC meetings, discussions revolved around the objectives and learning outcome of the curriculum, data use in physical education and its importance, data collection methods and instruments (HrF, HrF knowledge, physical activity), measurement and evaluation, and teacher competencies.

At the beginning of the DBDM-PD program, teachers were asked to collect data from their students related to HrF, HrF knowledge, and physical activity levels. Teachers were supported by the researcher in collecting HrF data and providing predetermined data collection tools on HrF knowledge and physical activity level. In the 3rd and 4th weeks of the PLC meetings, teachers were trained on data processing using educational technology (Microsoft Excel) by an expert. As a result of collecting, analysing and interpreting their own data, teachers became aware of how data can be used for instructional purposes. Teachers' awareness increased that data can be used to determine the students' learning needs, get to know students, and increase students' awareness of their individual needs and their motivation to participate in physical activity.

Therefore, the category of awareness of data use for instruction consist of three sub-categories that are determining the students' needs, getting to know students, awareness and motivation of students. The subcategories are examined below, respectively.

Firstly, the participants used data to determine the needs of their students on HrF knowledge and physical activity participation. The data from the questionnaire provided teachers with information about the physical activity level of students throughout the one week (in physical education class, at recess, at lunch, at the weekend, in the evenings, right after school, and days of the week), thus enabling teachers to understand in which areas students needed support. The teachers determined that the students did not participate in enough physical activity outside of school time, and their physical activity levels were low, especially in the evenings. According to the field notes, teachers think that they keep their students active enough in the lessons. However, it is seen that they are not interested enough in their students' extracurricular physical activities and also did not collect any data on their students' physical activity needs before the intervention. Teachers' reflections are as follows;

> *Teacher 4: When I evaluated that physical activity survey, there were more than many students that were mediocre… The exercise rate out of school seemed very low. When you see as a whole, many [students] were inactive outside of school. [They were]*

active in school, inactive outside of the school and no one is doing anything special. (Interview)

Öğretmen 4: Ben o fiziksel aktivite anketini değerlendirdiğimde vasatın altında olan çok fazla da öğrenci vardı…Okul dışındaki egzersiz yapma alışkanlığı çok düşük geldi. Genele baktığınızda okul dışında birçoğu hareketsizdi. Okulda hareketli, okul dışında hareketsiz, özel bir şey yapan yoktu. (Görüşme)

Teacher 6: While kids are active in the physical education [lessons], do not transfer this to the extracurricular. For example, in the evenings, if we think about question 6, it was one of the lowest things. As it is 3 and below 3. He says that I go home in the evening and it is why I don't have physical activity. (PLC meeting-5)

Öğretmen 6: Çocuklar beden eğitiminde aktif olsa da ders dışına pek aktarmıyorlar bunu. İşte akşamları mesela 6. soruyu düşünürsek en düşük şeylerden biri de oydu. Yani 3 ve 3'ün altı. Akşam ben eve gidiyorum diye pek fiziksel aktivitem yok diyor. (MGT toplantısı-5)

Teacher 3: It was found in our measurements we have taken that all students were inactive in the evenings within the data analysis. (PLC meeting-5)

Öğretmen 3: Aldığımız ölçümlerde daha çok akşamları çok hareketsiz olduğunu bütün öğrencilerin veri analizlerinde bu ortaya çıktı. (MGT toplantısı-5)

The data provided teachers with evidence of their students' physical activity needs and prompted them to collect additional data about their students. Field notes also showed that teachers collected data on the individual needs of their students through informal interviews. Teacher 3 expanded his above reflection as "*For example, I have a student who is a football player. The kid is training three days a week but in the HrF tests he was found to be fat. I talked to the kid. I found out that the kid didn't care for himself outside of class activities, did not sleep well, did not pay attention to [his] eating and drinking [habits], did not do any physical activities in the evenings." (PLC meeting-5)-"Mesela benim futbolcu olan bir öğrencim var. Çocuk haftanın üç günü antrenman yapıyor ama fiziksel uygunluk testinde şişman çıktı. Çocukla konuştum. Çocuğun dersteki etkinlikler dışında kendine dikkat etmediği, uykuya dikkat etmediği, yemeye, içmeye dikkat etmediği, akşamları herhangi bir fiziksel etkinlik yapmadığını ortaya çıkardım." (MGT toplantısı-5)*

Teachers used data gained from the HrF knowledge test results to identify the knowledge level of students and decide which knowledge students have or have not. The teachers found that the students' HrF knowledge was inadequate and realized they did not give enough HrF knowledge in their classes. According to the researcher's field notes, teachers came to this awareness not while discussing the objectives of the

curriculum, but when examining the content of the HrF knowledge test. Teachers noticed that they should give more weight to theoretical/content knowledge. They expressed that;

> *Teacher 4: I gathered the most erroneous questions in the test, about 8-9 questions, others were already the ones related to strengths. In this way, I saw what the students did (know) and did not know. (Interview)*
>
> *Öğretmen 4: Testte en çok hata yapılan soruları çıkardım, yaklaşık 8-9 tane, diğerleri zaten güçlü olan yönlerdi. Böylece öğrencilerin neyi bilip, neyi bilmediklerini gördüm. (Görüşme)*
>
> *Teacher 6: For example, we made the knowledge test. We saw how weak the children's knowledge was and before all. We have to go into theory as well as practice, we understood that too. Because, children knowing what they do, knowing their development is very very important is what we thought. For this point on, so, we will essentialize theoretics more. (Interview)*
>
> *Öğretmen 6: Mesela bilgi testini uyguladık. Çocukların bilgilerinin ne kadar zayıf olduğunu gördük her şeyden önce. Uygulamanın yanında teoriye de girmeliyiz, onu da anladık. Çünkü çocuğun ne yaptığını bilmesi, gelişimini bilmesi çok çok önemlidir diye düşündük. Bundan sonra hani teoriye daha bir önem vereceğiz. (Görüşme)*
>
> *Teacher 2: This training has also annexed me [this]. Yes, not only will the child be active but also that the child has to be given theoretical knowledge… The children know how to do it but they don't know what and why they do it. (PLC meeting-6)*
>
> *Öğretmen 2: Bu eğitim bana şunu da kattı. Yani evet, sadece çocuk hareketli kalmayacak, çocuğa teorik bilgi verilmesinin de gerektiğini…Çocuklar nasıl yapacağını biliyor fakat ne yaptığını ve neden yaptığını bilmiyor. (MGT toplantısı-6)*

Teacher 2 expanded on the importance of knowledge as follows *"If he understands why he does it, he will also learn how he must do it. The child is more successful at the physical abilities that he is aware of. That moment, (at once,) the psychological preparation is complete there." (PLC meeting-6)-"Neden yaptığını bilirse, nasıl yapması gerektiğini de öğrenir. Çocuk farkında olarak yaptığı fiziksel beceride daha başarılı. Bir kere psikolojik hazırlığı tamamlıyor orda." (MGT toplantısı-6)*

Secondly, the data affected the teachers' perspectives on the lesson and their students. The data provided teachers with the opportunity to get to know their students better and contributed to the establishment of teacher-student connections. As the teachers examined their students' HrF, HrF knowledge and physical activity data, they obtained more detailed information about their students than ever before. Field notes findings showed that this situation caused selectivity in perception towards the students from

whom teachers collected data and they were more interested in the physical activities of the students concerned. Teachers associated their students with their data. They said that;

> *Teacher 2: The children have been coded through data. Already, the child's answers to the questions in that graphic or the data in the HrF tests came out name by name so directly, like it came in front of me as a question mark. (Interview)*
>
> *Öğretmen 2: Çocuklar verileriyle kodlandı. Zaten o grafikte çocuğun soruya verdiği yanıtlar ya da fiziksel uygunluk testlerindeki o veriler isim isim de çıkarttığımız için direkt soru işareti gibi çıktı karşıma. (Görüşme)*

> *Teacher 5: Before the data, we didn't have any awareness of the children, I have never paid attention, but when we have taken the data, especially on the days when I was in hall duty, I especially went to that class to see what these children were doing during the recess. (Interview)*
>
> *Öğretmen 5: Verilerden önce hiçbir farkındalığımız yoktu çocuklara karşı, ben hiç dikkat etmezdim ama verileri aldıktan sonra özellikle nöbetçi olduğum günlerde, özellikle gidip o sınıfa bakıyorum bu çocuklar ne yapıyor teneffüste diye. (Görüşme)*

Teacher 5 added that *"It was a new class for me already, so I have not met the students. It was nice to have met them this way… It is certain that it has developed our relationships much more than other classes with these students." (Interview)- "Benim için yeni bir sınıftı zaten, tanımadığım öğrencilerdi. Bu yolla tanışmak güzel oldu…Öğrenci ile ilişkilerimizi diğer sınıflardan daha çok geliştirdiği kesin." (Görüşme).* Teachers stated that they especially remember students whose measurement results are outside the reference values. As a result of using data, they evaluated students from different perspectives. The statements of the teachers about subject as follows:

> *Teacher 6: For example, the students who have high body mass index or who struggle in push ups or sit up are engraved in memory, for sure. (PLC meeting-5)*
>
> *Öğretmen 6: Mesela beden kitle indeksi yüksek ya da şınavda mekikte sıkıntı çıkan öğrenci aklına kazınıyor bir kere. (MGT toplantısı-5)*

> *Teacher 1: When the data about the students came out, I saw how important the quantitative data was. After that I looked at the students with another perspective after evaluating that data... (PLC meeting-5)*
>
> *Öğretmen 1: Öğrencilerle ilgili veriler ortaya çıkınca sayısal verilerin ne kadar önemli olduğunu gördüm. Bu sefer öğrenciye başka gözle bakar oldum o verileri değerlendirince… (MGT toplantısı-5)*

Thirdly, it was also revealed that the data could be used to increase students' awareness of their individual needs (HrF, HrF knowledge, and physical activity) and their motivation to participate in physical activity. According to the field notes findings, it is understood that when evidence (data) about themselves is presented to the students, they are more willing to act and correct their deficiencies. Data can be used as a source of motivation. Teachers emphasized the importance of sharing data analysis results with students. They declared that;

> *Teacher 6: Casting the data to numbers, presenting this to the students, establishing a dialogue with the student also lights up the student. They say that this is what we didn't do here. If we do it, we will be better, we should do these activities and such a manner which motivates also the students. (Interview)*
>
> *Öğretmen 6: Verileri sayılara dökmek, bunu öğrenciye sunmak, öğrenciyle diyalog kurmak öğrencide de bir ışık yakıyor. Diyor ki ya demek ki biz burada bunu yapmamışız. Bunu yaparsak daha iyi olacağız, şu etkinlikleri yapmalıyız şeklinde öğrenciyi de motive ediyor. (Görüşme)*
>
> *Teacher 4: We lured in the students that are already good at sports and already liked sports with our classic methods. But, the plus side of this is that when we present it as visuals, the children who are not acquainted with sports say that oh I am fat, my arm strength is insufficient, I couldn't do sit ups, so, now on, I can catch up with the others [type of] motivation is created [by the help of this data visualization]. (PLC meeting-6)*
>
> *Teacher 4: Biz bugüne kadar kendi klasik yöntemlerimizle zaten spora yatkın, sporu seven çocukları zaten cezbediyor idik. Ama bunun artısı verileri görsele döktüğümüzde spora ilgisi olmayan çocuklar da ya ben kiloluymuşum, benim kol gücüm yetersizmiş, ben mekik çekemiyor muşum. Bundan sonra ben de diğerlerini yakalayayım motivasyonu yaratmasını sağladı. (MGT toplantısı-6)*
>
> *Teacher 2:…Especially our M.A., he is the most obese. He said oh teacher, was I this much [fat] and such (about the BMI)...Because everyone tells M.A. already, they say you are fat. But, putting these into numbers is much more convincing. The child has proof of why. (PLC meeting-6)*
>
> *Öğretmen 2:…Özellikle bizim M.A, zaten en obezimiz o. Aaa hocam dedi, ben bu kadar mıydım falan (BMI ile ilgili)…Çünkü M. A.'ya zaten herkes söylüyor, kilolusun diyor. Fakat bunu sayılarla konuşmak daha ikna edici oluyor. Çocukta kanıt oluyor çünkü. (MGT toplantısı-6)*

The second category under the theme 1 is professional knowledge and skill development consist of two sub-categories that are content knowledge and measurement and evaluation.

During the second week of the PLC meetings, data collection instruments (HrF knowledge test and physical activity participation questionnaire) and their content were discussed in detail. The HrF knowledge test includes cardiovascular endurance, muscle strength/endurance, flexibility, body composition, training principles, and general health knowledge components. The researcher's field notes reveal that while HrF knowledge test were examining, teachers also questioned their own HrF knowledge level. Teachers realized that their HrF content knowledge was insufficient. The statements of the teachers included that they forgot some information on HrF and they need to update it. According to the findings, the teachers thought there was an improvement in their content knowledge after the DBDM intervention. Teachers learned from each other's experiences in the PLC meeting, felt the need to research the new information they gained in the meetings, and updated their existing content knowledge. They stated that as following;

> *Teacher 5: As content knowledge that is most important, for example, I didn't know about BMI this much, I didn't think in terms of the students, that it was this much important. The effects of this in the students have started to settle in my mind [now]. As, planning exercises individually for these kids have started to settle in mind. (Interview)*
>
> *Öğretmen 5: Alan bilgisi olarak en önemlisi mesela vücut kitle indeksinin ben bu kadar, öğrenciler açıdan hiç düşünmemiştim bu boyutta önemli olduğunu. Bunun öğrenciler üzerindeki etkileri benim kafamda oturmaya başladı. Yani çocuklara bireysel olarak egzersiz planlama kafamda oturmaya başladı. (Görüşme)*
>
> *Teacher 6: You see that there are some deficiency in content knowledge… The topics in meetings, of course, have an effect on content knowledge or you come across with something that you have never seen before. For example, other teachers have also lived different experiences, they mention different things. Even though you do not completely get that right there, later on, you feel the need to research that. (Interview)*
>
> *Öğretmen 6: Alan bilgisi tabi eksiklikler olduğunu görüyorsun… Toplantılardaki konuşulanlar alan bilgisine tabi ki etki ediyor ya da hiç karşılaşmadığın bir şeyle karşılaşıyorsun. Mesela diğer hocalar da mesela çok farklı şeyler yaşamış, farklı şeylerden bahsediyorlar. O farklı şeyin tam olarak orada alamasan bile daha sonra onu araştırma ihtiyacı hissediyorsun. (Görüşme)*
>
> *Teacher 2: There was an update about the teaching styles and the curriculum. For example we reviewed it, updated it, remembered it. So, I can say that the faded knowledge has come back. (PLC meeting- 6)*
>
> *Öğretmen 2: Stiller ya da öğretim programlarıyla ilgili bir güncelleme oldu. Hani tekrar ettik, bir güncelledik, tekrar hatırladık. Hani sönen bilgiler tekrar geldi diyebilirim. (MGT toplantısı-6)*

In the second week of the PLC, teachers became aware of the relationship between physical education and other branches while discussing HrF knowledge. The relationship between HrF knowledge in physical education and science subjects especially attracted their attention. Teacher 1 stated in the second meeting that "*If I were a science teacher, I went by the pyhsical education teacher the next day for example. If this topic is brought up (is explained), but you have to access that now, awaken that."-"Fen bilgisi öğretmeni olsaydım ben ertesi gün gitmiştim beden eğitimi öğretmeninin yanına mesela bu konu anlatılıyorsa. Ama şimdi ulaşmak lazım, uyandırmak lazım."* Teachers' awareness of interdisciplinary linking in the curriculum increased and they developed strategies to collaborate with science teachers. They expressed the following in the interview after the intervention;

> *Teacher 3: I also learned that in some topics for example, they said that in the meetings. Physical education and science topics can be associated. We will collaborate with the science teacher. (Interview)*
>
> *Öğretmen 3: Mesela bazı konularda da şunu öğrendim, toplantılarda söylediler. Beden eğitimiyle fen bilgisi konuları ilişkilendirilebilir. Fen bilgisi öğretmeniyle iş birliği yapacağız. (Görüşme)*
>
> *Teacher 6: For example we applied the knowledge test, it was nice. Whether which courses can be associated in according to that of knowledge test, we had a nice discussion there. (Interview)*
>
> *Öğretmen 6: Mesela bilgi testini uyguladık, o güzeldi. Bilgi testinde acaba hangi derslerle nasıl ilişkilendirebiliriz diye orada güzel bir tartışmamız oldu. (Görüşme)*
>
> *Teacher 2: First of all, the relationship of physical education to science attracted our attention. (Interview)*
>
> *Öğretmen 2: Bir kere beden eğitiminin fen bilgisi ile olan ilgisi çok dikkatimizi çekti. (Görüşme)*

Teachers realized that HrF knowledge is an essential part of physical education classes. They understood that there are objectives related to knowledge in the curriculum and that knowledge should be included in the classes and measurement-evaluation process. Teachers discussed the importance of HrF knowledge in PLC meetings. Field notes revealed that teachers need to increase their content knowledge. Therefore, various resources related to HrF knowledge were presented to the teachers during the intervention weeks and also the teachers turned to extra resources. Teacher 3 explained that;

Teacher 3: In terms of the content knowledge, I took notes on what I found to be lacking in the fields of courses. Others were about the topics that was instructing, I evaluated those from the books at school and I also have books at home, I opened them, read, what deficiencies I have or what kind of mistakes I can make, these and the goals whether I have reached [them]. (Interview)

Öğretmen 3: Alan bilgisiyle ilgili eksik olduğumu gördüğüm alanlardan derslerde gördüğümü not aldım. Diğerleri benim işlediğim konularla ilgili okuldaki kitaplarımız varsa da evde de var kitaplarım onlardan açtım, okudum, ne eksiklerim var ya da yaparken ne yanlışlıklar yapabiliyorum onları ya da hedefe ulaşabildim mi onları değerlendirdim. (Görüşme)

In the PLC meetings, teachers discussed the curriculum and their professional responsibilities. During the intervention process, teachers also questioned their own educational processes and professional development. One of the teachers most strikingly expressed his content knowledge development like this;

Teacher 5: We have learned things that we haven't learned in university so far or we haven't learned in our professional life. So, when we graduated from the university, we graduated ineffectually. When we started this profession, we were not equipped at all. It's my twelfth year in the profession, we have done something for twelve years, but we didn't know what we were doing and why. (PLC meeting-6)

Öğretmen 5: Yani üniversitede bugüne kadar öğrenmediğimiz ya da mesleki hayatımızda öğrenmediğimiz şeyleri öğrendik. Yani biz üniversiteden mezun olduğumuzda boş mezun olmuşuz. Mesleğe atıldığımızda boş atılmışız. On ikinci yılım meslekte benim, on iki yıl boyunca bir şeyler yapmışız ama neyi, niçin yaptığımızı bilmiyormuşuz. (MGT toplantısı-6)

In the PLC meetings, teachers went through the processes of collecting and organizing data, analyzing and interpreting data, and then visualizing. After the teachers collected data from their students, they used educational technology to process them. They worked intensively on their data using the Microsoft Excel program throughout the intervention. Most of the teachers stated that they had experience using Microsoft Excel, but they did not use it frequently for instructional purposes. The researcher's field notes showed that teachers made sense of why and how to do measurement and evaluation after the DBDM-PD program. It was shown that the most important achievement of the teachers was in analyzing, interpreting and visualizing their data. Teachers emphasized the importance of visualizing data and the effect of visual data on students. Participants evaluated their use of technology in data processing as follows:

Teacher 6: ...I think that I can reflect upon my instruction saying that this is data processing…I collect data, analyze the data I have collected, tabulate the data I have collected, and put up in my classes. After that, I can use the activity I need in my lessons, in the end I can evaluate and analyze them. So, I can follow the development. In that manner, I can do everything, I can make this process. (Interview)

Öğretmen 6:...Veri işleme böyle oluyormuş deyip öğretimime yansıtabileceğimi düşünüyorum…Veriyi toplarım, topladığım veriyi analiz ederim, topladığım veriyi tablolaştırırım, sınıflarıma asarım. Ondan sonrasında gerekli olan çalışmayı derslerimde kullanır, en son gene ölçer onları da analiz ederim. Yani gelişimi takip ederim. Hani her şeyi, bu süreci yapabilirim. (Görüşme)

Teacher 2: There wasn't a problem in data collection. But I realized a lack of ability in casting a graphic of it and in this instruction, I solved that problem. My most precious acquisition was casting a graphic, diversifying these graphics, interpreting it and conveying this to the children, the skill to explain with numbers. (PLC meeting-6)

Öğretmen 2: Veri toplamada problem yoktu. Fakat bunları grafiğe dökmedeki eksikliğimi gördüm ve bu eğitimde onu, o problemimi çözdüm. Grafiğe dökmek, grafiği çeşitlendirmek, yorumlamak ve bunu çocuklara iletebilmek, sayılarla anlatabilmek becerisini elde etmek en büyük kazanımım oldu. (MGT toplantısı-6)

Teacher 1: I didn't know basic Excel. I never needed it… It was beneficial to me. Let me put it this way, I needed a list the other day and I sat down to do it myself…I can make tables, color them. So, I [can make] a table comfortably, [before] it was [a matter of] death to me, now, I can sit down to do it. (PLC meeting-6)

Öğretmen 1: Temel Excel bende hiç yoktu. Hiç gerek duymamıştım… Bana çok faydası oldu. Şöyle söyleyeyim, geçen bir liste gerekti oturdum hemen kendim yaptım…Tablo falan oluşturabiliyorum, renklendirebiliyorum. Yani şöyle bir tabloyu artık çok rahat, benim için bu ölümdü şimdi oturup yapabiliyorum. (MGT toplantısı-6)

Teacher 5: I already knew [how to use] excel, we add upon it like, we see our deficiencies. We had some struggles in one graphic case but we handled it. (Interview)

Öğretmen 5: Ben zaten excel kullanmayı biliyordum, üstüne koyuyoruz yani eksiklerimizi görüyoruz. Bir grafik olayında biraz sıkıntılarımız vardı, onu hallettik. (Görüşme)

Teacher 3: I knew [how to use] excel before but I have forgotten a lot. We applied how the data inventories was made in excel, [how to] organize [them], [use] the formulas, etc. (Interview)

Öğretmen 3: Excel'i ben önceden biliyordum ama baya unutmuşum. Excelde verilerin dökümlerinin nasıl yapıldığını, organize etmeyi, formüllerini vesaire uyguladık. (Görüşme)

He continued with, *"I also especially enjoyed the feature of casting graphics, because, when you tell a student you have made 24 of this it is not, (thing) but when the child sees his activity in graphics, [where he] sees low or high is a plus for the kids and also me."-"Yani bir de bunun özellikle grafiğe dökmek daha çok hoşuma gitti. Çünkü öğrenciye 24 tane şunu yaptın dediğin zaman şey değil ama çocuğun yaptığı etkinliği*

grafikte sütunlarda görmesi, yüksek görmesi ya da alçak görmesi çocuklar için benim için de bir artı oldu."

Theme 2: *The instructional practices of teachers relating to DBDM*

After examining the semi-structured interviews, video recording of the 6th PLC meeting, field notes and observations, the categories of (1) increasing physical activity (in-school practices and out-of-school practices) and (2) knowledge transfer (lesson practices and interdisciplinary cooperation) emerged for DBDM teacher practices.

The teachers applied the HrF knowledge test and physical activity participation questionnaire suitable for the grade level at the beginning of the intervention. Then, they analyzed the data, identified the strengths and weaknesses of the students, and interpreted the results at the end of the 4th week of the PLC meetings. Pedagogical strategies in order to meet the needs of students were discussed in the 5th week PLC meeting. Teachers evaluated the resources, opportunities, and environments of their schools, then determined the practices that would be most effective for their students. In the six-week implementation weeks after the intervention, teachers were expected to use the data they obtained from their students as a basis for their decisions about instructional practices.

The teachers revealed that most of their students did not participate in enough physical activity outside of physical education classes, according to the results of the physical activity questionnaire. In PLC meetings, teachers discussed pedagogical strategies to increase students' participation in physical activity. The researcher's field notes containing the pedagogical strategies suggested in these meetings were shared with the teachers (see Appendix O). During the implementation weeks, teachers used some of these strategies according to the needs of their students and school facilities. The pedagogical strategies for increasing the physical activity participation of students are grouped into two categories: in-school practices and out-of-school practices. The category of in-school practices consists of recess and lunch break activities, the use of pedometers, observation and interview, and data use in parent meetings.

Some of the teachers utilised school time to increase students' physical activity levels. One of the teachers, whose school has a gym, used lunch breaks to intervene in the physical activity participation of his students. He prepared various activity plans to be implemented during lunch breaks (see Appendix P). While planning these activities, he also considered the students' HrF data. He pointed it out in this way;

> *Teacher 3: At lunch time, three days a week- monday, thursday, friday- in fact I also was among them as we did various activities in the gymnasium. By the way, my class consists of 31 students. When I was doing this, I did not only include the students that had problems in the HrF tests but also the other students actively to the game during the 45 minutes at lunch time. Because, the other kids need to at least conserve their current positions, to be in the activity. (PLC meeting-6)*
>
> *Öğretmen 3: Öğle aralarında, haftada 3 gün -pazartesi perşembe cuma- bilfiil ben de aralarına girerek spor salonunda çeşitli etkinlikler yaptık. Sınıf mevcudum bu arada 31 öğrenci. Bunu yaparken ben sadece fiziksel uygunluk verilerinde problem olan öğrencileri değil diğer öğrencileri de aktif olarak 45 dakikalık öğle arasında oyuna soktum. Çünkü diğer çocuklarında en azından bulunduğu pozisyonlarını korumaları lazım, aktivite içinde olması lazım. (MGT toplantısı-6)*

Teacher 3 also diversified the lunch break activities in line with the needs and interests of the students and school facilities. According to the field notes, the teacher took notes continuously to ensure that the students did not get bored with the activities and to avoid repetition. He articulated that "*We started at first with the skipping rope with eight students in the gymnasium. After that I made them play football, play basketball. Plus that, if they want to play I made them play table tennis. we have different places for table tennis… Also [I] make them play futsal. Two of my students said that they wanted to play basketball after playing 4-5 weeks of basketball. I divided the gymnasium into three…" (PLC meeting-6) -"Salonda ilk etapta sekiz öğrenci iple başladık. Ondan sonra basketbol oynattırdım, voleybol oynattırdım. Artı, oynamak isteyenlere ben bir de masa tenisi oynatıyorum. Masa tenisi için ayrı yerlerimiz var…Futsal da oynatıyordum. İki tane öğrencim 4-5 hafta basketbol oynadıktan sonra öğretmenim biz futbol oynamak istiyoruz dedi. Sahayı üçe böldüm…"(MGT toplantısı-6)*

Three teachers, who do not have a gym in their schools, supported the physical activities of the students by providing various materials (skipping rope, climbing rope, ball, and badminton equipment) during recess and lunch breaks in the school

playground. According to the field notes, teacher 1's organisation of jumping rope and tug-of-war activities/competitions during lunch breaks and recesses in her school, which she stated in the PLC meetings, was a strategy preferred by other teachers during the implementation weeks. They expressed that:

> *Teacher 2: After interpreting the results of analysis, and conveyed it [to them, I gave these students skipping ropes and balls at recesses. I told them that they can play with these equipments at recesses and lunch as you wish. They passed that term in that way, being active. (Interview)*
>
> *Öğretmen 2: Hocam bu çocuklara analiz verilerini yorumladıktan sonra, ilettikten sonra teneffüslerde ip verdim… İp, top verdim. Dedim ki bu malzemelerle teneffüslerde, öğle arasında bahçede istediğiniz gibi oynayabilirsiniz. O dönemi o şekilde hareketli geçirdiler. (Görüşme)*

> *Teacher 6: … In terms of this rope jumping at the recess, so, the skipping rope was like hot cakes (the thing that was gone greedily.) Then, I gave them the climbing rope, I jumped along with them for a while, then they continued. (PLC meeting-6)*
>
> *Öğretmen 6: …teneffüslerdeki şu ip atlama konusu mesela ip bayağı bir kapış kapış gitti. Sonra halat verdim, onlarla birkaç atladım, sonrasında onlar devam ettiler. (MGT toplantısı-6)*

In addition, the use of pedometers as a strategy to increase students' physical activity was discussed at the PLC meetings. At the request of some teachers, pedometers were provided to them by the researcher. Pedometers were used as a motivational tool for physical activity and provided students with information about their physical activity levels during school hours. As a result, the use of pedometer was very effective in increasing students' physical activity in school time. Researcher's lesson observation support that the use of pedometer encourages students to move more. Teacher 1 reported in 6th PLC meeting that "*Especially after the pedometers were distributed, they were very active during recesses.*"-*"Özellikle adımsayarlar dağıtıldıktan sonra teneffüslerde çok aktif oldular."* She expanded on the pedometer use;

> *Teacher 1: When the pedometers were distributed the children also understood. So, [they asked themselves] what am I doing [and] what I should do? For example, there is a ball in the corner. I ask who wants it and all of them say me, me, me, before this no one wanted it (no one went there). That was so effective! These children need something visual. (PLC meeting-6)*
>
> *Öğretmen 1: Bu adımsayarlar dağıtılınca çocuklar da anladı. Yani ben fiziksel aktivite ne yapıyorum ne yapmam gerekiyor? Mesela köşede top var. Kim alır diyorum hepsi ben ben ben diyor, önceden kimse gitmezdi. O müthiş etkili oldu yani. Bu çocuklara görsel bir şey lazım. (MGT toplantısı-6)*

In the first two and 5th weeks of the PLC meetings, the subject of measurement and evaluation in physical education and sports was discussed. Discussions included quantitative data collection tools such as questionnaires and tests, and quantitative data collection tools such as observation and interviews. During the implementation weeks, teachers conducted observations and informal interviews to monitor and provide feedback on their students' physical activity participation at school. They said that;

> *Teacher 3: I observe the activities that I have done outside of class during lunch break or during recess. I tell the kids you did this incomplete today. I had feedback as 'attend this a little more in the evening'. (Interview)*
>
> *Öğretmen 3: Ders dışında yaptırdığım etkinlikleri öğle arasında ya da teneffüste ben dışarıdan gözlemliyorum. Çocuklara bugün bunu eksik yaptınız diyorum. Buna akşam biraz daha katkıda bulun şeklinde dönüşlerim de oldu. (Görüşme)*
>
> *Teacher 2: I observed the kids at recess as much as possible. I immediately asked them what happened, what did you do this week… So, I am not always together with them [but] the ones I saw, I interrogated [them]. (PLC meeting-6)*
>
> *Öğretmen 2: Her fırsatta teneffüslerde gözlemledim çocukları. Hemen soruyordum ne oldu, ne yaptın bu hafta… İşte kimi gördüysem hani sürekli beraber değilim çocuklarla hemen sorguladım. (MGT toplantısı-6)*
>
> *Teacher 1: I especially always observed the ones that are outliers (BMI) and indeed made some interviews. (PLC meeting-6)*
>
> *Öğretmen 1: Ben özellikle uç sınırdakileri (BMI) hep gözlemledim ve bilfiil görüşmeler yaptım. (MGT toplantısı-6)*

In PLC meetings, teachers declared that families are an effective factor in increasing students' physical activity participation. Teacher 4 speculated it in 5th PLC meeting like that, *"After some point, we fail to reach out to the student. One of the utmost important stakeholders [in the education system] is the parents."-"Bir noktadan sonra öğrenciye ulaşmakta başarısız oluyoruz. Eğitim sisteminin en önemli paydaşlarından biri velilerdir."* It has been discussed that the support and encouragement of parents are influential in students' participation in physical activity, and they should be informed about their children's physical activity levels and physical fitness. For this reason, three teachers organized parent meetings and wanted to raise awareness by sharing their children's HrF and physical activity data at these meetings. Parents were presented with reference values for these data, their children's values were shown on coloured graphs and physical activity for health was emphasized. From the researcher's field notes, it is understood that parents impressed by the teachers' data sharing and

their awareness of their children's needs increased. In PLC meeting 5, teacher 5 explained that "*When we go to the parents with these data, it is more explanatory, and the parents are convinced that their child has a weight problem or is extremely thin and that we need to overcome this. They used to say that my child is normal for me, but when you have international standards and data, they cannot say anything."-"Bu verilerle veliye gittiğimiz zaman hem daha açıklayıcı oluyor, veli de ikna oluyor artık çocuğunun kilo problemi olduğunu ya da aşırı zayıf olduğuna ve bunu aşmamız gerektiğine. Benim çocuğum bana göre normal deyip geçiyordu ama elinizde uluslararası standartlar ve veriler olduğu zaman orada bir şey diyemiyor."* The other statements as followed;

> *Teacher 5: I told the parents that according to the test results, it is found that the children are never active outside of school… If we do not pay attention to the body mass index of these children, they are in danger of becoming obese in the future, they are in danger of cardiovascular diseases. A few of our parents took their children to the doctor, said they had blood tests. This was a good development for me. (Interview)*
>
> *Öğretmen 5: Velilere dedim ki yaptığımız test sonucunda çocukların okul dışında hiç hareket etmedikleri ortaya çıkıyor…Eğer dedim bu çocukların vücut kitle indeksine dikkat etmezsek ileride obez olma tehlikeleri var, kalp damar rahatsızlıklarına yakalanma tehlikeleri var. Birkaç tane velimiz çocuklarını doktora götürdüler, kan tahlili verdiklerini falan söylediler. Bu güzel bir gelişmeydi benim için. (Görüşme)*
>
> *Teacher 2: I explained [to the parents] that according to the analysis results the children were inactive, by interpreting the graphics, the graphics means this and showing them on the projector in the conference hall here (in school)... It was very effective. The parents have also been influenced as much as the students by these numbers. I think the parent's anxiety was more than the child's, because of the health dimension. (PLC meeting-6)*
>
> *Öğretmen 2: Analiz sonuçlarına göre çocukların hareketsiz olduğunu, grafiğin de bu anlama geldiğini grafiği yorumlayarak ve onlara buradaki (okul) konferans salonunda projektöre yansıtıp göstererek anlattım…O çok etkili oldu. Bu rakamlardan öğrenci ne kadar etkilendiyse veli de o kadar etkilendi. Bence velinin kaygısı çocuktan daha fazlaydı, sağlık boyutu kaygısı. (MGT toplantısı-6)*
>
> *Teacher 3: After interpreting the analysis results, I conveyed all the parents in a meeting that I held on zoom. I mentioned that the children need to stay active outside, if they do not stay active and have familial disorders, illnesses, etc. they could surface in these children. The parents were so attentive, the sound stopped. I presented them with a concrete document, I gave them an indicator. Because they saw the concrete document of their own children, when they saw the data, whether in graphs or numerical values... Some parents said we did not know this was the case, we will pay attention to this. I conveyed it like this, they were influenced. (Interview)*
>
> *Öğretmen 3: Bir kere analiz sonuçlarını yorumladıktan sonra zoom üzerinden yaptığım toplantıda velilerin hepsine ilettim. Çocukların dışarıda hareketli kalmaları gerektiğini, eğer hareketli kalmazlarsa aile öykülerinde problem yaşıyorsa, hastalık*

vs. onlarda çocuklarda ortaya çıkabileceğinden bahsettim. Veliler pür dikkat oldu, ses kesildi. Onlara somut bir belge sundum, gösterge verdim. Çünkü kendi çocuklarının somut belgesini gördüler, grafikte olsun, sayısal değerlerde verileri görünce…Bazı veliler böyle olduğunu bilmiyorduk, buna dikkat edeceğiz dediler. Bunları bu şekilde ilettim, etkilendiler. (Görüşme)

Teachers stated that they can intervene in their students' physical activity during school hours and physical education lessons, but this was not possible outside of school hours. Therefore, teachers used various out-of-school practices (assignments/tasks, and orientation to various sports branches or activities) to increase students' physical activity levels.

Teachers utilised pedometers (smart watches, phones), physical activity diaries, online resources (videos), and individual exercise plans when assigning students. To encourage students to engage in physical activity, they were asked to keep a physical activity diary and to take an average of 12,000 steps every day or to participate in regular physical activity for at least one hour a day. At the end of the day, students were expected to write their activities in their physical activity diaries (see Appendix Q). Thus, an attempt was made to raise awareness about participation in physical activity among students. It is understood that physical activity diaries and pedometers are effective tools for increasing the physical activity level of students. Teachers reported that;

Teacher 3: I believe that the physical activity diaries have motivated the students. Because, even though I spoke [to them] the students who didn't attend the activities; it made them attend afterwards (again), start [to join the activities], enter [the games], play. It encouraged [them], so. (Interview)

Öğretmen 3: Günlüklerin öğrencileri harekete geçirdiğine inanıyorum. Çünkü konuştuğum halde etkinliklere katılmayan öğrencilerin de etkinliklere tekrar katılmasını, başlaması, girmeleri, oynamalarını sağladı. Teşvik etti yani. (Görüşme)

Teacher 2: The physical activity diaries were collected, but, when I checked a little bit, I saw that there were 8-10 students who did it regularly, incrementally. That diary motivated the students a little bit. I mean, having written it, I have done this much. (Interview)

Öğretmen 2: Günlükler geldi. Fakat biraz kontrol ettiğimde düzenli yapan, artarak yapan 8-10 öğrenci gördüm. O günlük biraz motive etti çocukları. Yani onu yazmış olmak, ben bunu bu kadar yaptım. (Görüşme)

Teacher 6: Of course there was awareness. Child realised that not all his/her activity was in physical education or anything else. I wear this (pedometer) all day long, I have to be active until I go to bed, he/she thought. (PLC meeting-6)

Öğretmen 6: Tabi farkındalık oldu. Bütün aktivitesinin beden eğitimi dersinde ya da başka bir şeyde olmadığını anladı çocuk. Ben bunu (adımsayar) takıyorum gün boyu, yatana kadar benim bilfiil aktif halde olmam gerekiyor diye düşündü. (MGT toplantısı-6)

Teacher 5: The pedometers were incredibly effective in our students (in us)... If our goal was to create a physical activity awareness, that awareness has been created. (Interview)

Öğretmen 5: Adımsayarlar bizde inanılmaz etkili oldu…Öğrencilerde fiziksel aktivite farkındalığı yaratmaksa bizim hedefimiz, o farkındalık yaratıldı. (Görüşme)

Teacher 1: One of my [student's] parents has come, the mother of A.E. the most plumpy [of our students] is A.E. She said, when we put it (pedometer) on, he takes 12000 steps, even more, she said. I asked whether it was like this before. She said it made a difference… (PLC meeting-6)

Öğretmen 1: Bir velim geldi, A.E.'nin annesi. En tontonumuz A.E. Hocam dedi, onu (adımsayar) takınca 12000 adım atıyor, geçiyor bile dedi. Dedim öncesinde de öyle miydi acaba. Bunun etkisi oldu dedi… (MGT toplantısı-6)

Teachers used also online resources provided to them by researcher to engage students with physical activity out of school (after school, evenings, weekends). As COVID-19 was ongoing, both students and teachers were competent in using online resources. Teachers first examined the videos and then shared some activity videos that would attract the students' interest, were fun and had appropriate materials with the students through WhatsApp groups. According to the field notes, online resources were used by some students not all of them. It can be said that video resources were especially effective for female students. Teacher 2 stated the following in the 6th PLC meeting *"We have WhatsApp groups already. I sent the videos through there and I wanted feedback from my students. Especially, the female students were found to be very recipients and they liked it. There was not that much positive response from males."*- *"Bizim WhatsApp gruplarımız var zaten. Oradan videoları gönderdim ve öğrencilerden dönüt istedim. Özellikle kız öğrencilerimiz çok duyarlı çıktı ve çok hoşuna gitti. Erkeklerden o kadar olumlu tepki gelmedi."* Teacher 1 posted online activities to almost the entire class, but the resources were used mainly by students who had no problems with their physical fitness parameters. She expressed in the interview that *"In general, those who do not have a problem with their HrF said it*

was a lot of fun."-"Genel olarak HrF sorunu olmayanlar çok eğlenceli olduğunu söylediler."

Teachers 3 used data from the physical activity questionnaire and HrF test to assign students various tasks outside the school. He prepared individual exercise programs to increase the physical activity of the students. The teacher 3 also selected activity videos by considering the needs of the students and sent them individually. He shared the followings:

> *Teacher 3: After examining the surveys I asked [myself] how I can make students active in the lunch time and evenings. After that, I examined the videos you showed at the meeting and the programme you sent us. I got the students' HrF results in front of me, I took short notes thinking what I can make them do for these. I wrote alternatives, I said, for example, you can do sit-ups, push-ups for arm muscles. You can also do squats, planks. I said that saying would not be enough, casted on paper. I wrote an exercise program of 3 days and 4 days for some students for [in total of] fourteen of the students. (Interview)*
>
> *Öğretmen 3: Anketi inceledikten sonra dedim ki öğrencileri öğlenleri ve akşamları nasıl hareket ettirebilirim. Ondan sonra sizin toplantıda izletmiş olduğunuz videoları ve bize göndermiş olduğunuz programı inceledim. Sağlıkla ilgili fiziksel uygunluk değerleri önüme aldım, bunlar için neler yaptırabilirim diye ufak ufak notlar aldım. Alternatifler yazdım, dedim ki mesela kol kasları için işte mekik, şınav çekebilirsin. Bunun yanında squat yapabilirsin, plank yapabilirsin. Bunu söylemekte olmaz dedim, kağıda döktüm. On dört tane öğrenciye haftada 3 gün bazı öğrenciler 4 gün egzersiz programı yazdım. (Görüşme)*

One of the teachers searched for various sports opportunities available to their students to increase their physical activity outside of school. The others also encouraged their students to participate in various sports branches. They articulated that;

> *Teacher 2: Aside from the lessons, Provincial Directorate of Youth and Sports has (makes) free courses. I took the Sincan Family Living Centers' programs and learned that they are making badminton courses there, basketball, volleyball courses have started [and] made the necessary announcements, I conveyed the contact numbers. I made guidance for the sake of attending sports activities. One of my children (students) has gone [there] and got [himself] included in badminton. Another child also got [himself] included in the volleyball. (PLC meeting-6)*
>
> *Öğretmen 2: Ders dışında bu belediyenin, Gençlik ve Spor İl Müdürlüğünün yaptığı ücretsiz kurslar var. Sincan aile yaşam merkezindeki programı alıp orada badminton kursunun olduğunu, basketbol, voleybol kurslarının başladığını öğrenip çocuklara gerekli duyuruları, iletişim numarasını ilettim. Spor aktivitelerine katılım sağlaması amacıyla böyle bir yönlendirme yaptım. Bir çocuğum gitmiş, badmintonda dahil olmuş. Bir çocuğum da voleybola dahil olmuş. (MGT toplantısı-6)*

Teacher 3: I have students that I guided to volleyball, guided to basketball. They are continuing [that]. (Interview)

Öğretmen 3: Voleybola yönlendirdiğim öğrenciler var, basketbola yönlendirdiklerim var. Onlar devam ediyor. (Görüşme)

Teacher 6: We guided a student who has weight problems to a weekend football course by speaking with his parents… (Interview)

Öğretmen 6: Velisiyle konuşarak kilo problemi olan bir öğrencimizi hafta sonu futbol kursuna yönlendirdik. (Görüşme)

The second category of Theme 2 is knowledge transfer comprises lesson practices (theoretical and applied courses) and interdisciplinary cooperation subcategories.

The teachers were asked about the arrangements they made in their instructional practices after collecting, analyzing, and interpreting data from their students through the HrF knowledge test. Teachers stated that they especially determined the questions with the most mistakes in the knowledge test and tried to include those subjects in the lessons. In other words, they considered student data while designing and implementing their courses. During implementation weeks, the teachers carried out both theoretical and practical lessons. Some of the teachers solved the knowledge test with the students in the form of question-answer in the classroom and provided detailed information afterwards. According to the field notes, teachers prefer to transfer knowledge in the classroom rather than integrating it into practical lessons. The teachers used the smart board, various HrF-related images, resources, and videos in the theoretical courses. They articulated that;

Teacher 3: There have been those who called the heart liver or bone in the knowledge test. We put up (reflected on the projection device) the visuals that you have given us once and showed them on the board. See what it looks like we said. I put up the summary information also there, I made a student read them. I showed them [things] like the microcirculation, systemic circulation and the structure of the heart. (PLC meeting-6)

Öğretmen 3: Testte kalbe ciğer ya da kemik diyenler olmuş. Sizin verdiğiniz kaynaklardaki görseli bir yansıttık, gösterdik tahtada. Bakın neye benziyor diye. Özet bilgileri oraya da yansıttım, okutturdum bir öğrenciye. İşte gösterdim küçük kan dolaşımıydı, büyük kan dolaşımıydı, kalbin yapısı şeklinde. (MGT toplantısı-6)

Teacher 4: I solved the knowledge test in the classroom [with the students]. We covered (revisited) the questions that had missing points [as] some of them were aerobics, anaerobics, dorsum muscles, abdominal muscles, and what [kind of sports activities] would be beneficial for these. (PLC meeting-6)

Öğretmen 4: Ben bilgi testini sınıfta çözdüm. Hata yapılan sorularla ilgili eksik olan yönlerin bazılarını aerobik olsun, anaerobik olsun, sırt kasları olsun işte karın kasları olsun, nelerin bunlara faydalı olabileceğinin üstünden geçtik. (MGT toplantısı-6)

Teacher 1: On a rainy day, we solved all the questions in the classroom. We talked about it in a manner of question and answer, we reached a conclusion as we were having a chat. (PLC meeting-6)

Öğretmen 1: Yağışlı bir gün sınıfta tüm soruları cevapladık. Soru-cevap şeklinde üzerine konuştuk, muhabbet eder gibi çözüme ulaştık. (MGT toplantısı-6)

According to the lesson observations made by the researcher, the teachers used the data they obtained from the HrF test in the lesson design. It was observed that the teachers shared information on the importance of health and physical activity, the daily goal of 12,000 steps, the importance of warming up and cooling down, pulse rate and rate, breath control, and aerobic and anaerobic concepts in their lesson. These observations are similar to interview findings and teacher discourses in the sixth PLC meeting. The teachers summarized the knowledge transfer in the applied courses as follows.

Teacher 5: We talked in the meetings but day after day, in every attendance of a meeting we comprehended the importance of the data for us and so, our activities in class have also diversified. For example, before this I never gave such anatomy information when I instructed these children's classes. But now, we explain to the kids, whether the exercise is aerobics or anaerobics as also which muscles are labored. This made awareness in us also. (Interview)

Öğretmen 5: Toplantılarda konuştuk ama günler geçtikçe, her toplantıya katıldıkça verilerin bizim için önemini kavramış olduk yani ve ona göre de derslerdeki aktivitelerimiz çeşitlendi. Mesela eskiden ben hiç çocuklara girdiğim zaman böyle anatomik bilgiler vermezdim yani. Ama şimdi bir girdiğimizde çalışmanın aerobik mi, anaerobik olduğundan tutun da hangi kasların çalıştığına kadar çocuklara anlatıyoruz. Bu bizde de farkındalık yarattı. (Görüşme)

Teacher 4: As you know, learning by doing and experiencing is the most effective. I already made them understand aerobics and anaerobics by walking and running very clearly. Last week on friday, I held a competition within the classroom [of students]. When I was explaining the effect of respiration (breathing) in the exercise, I told them that you might feel out of breath (you won't have enough breath), your breath is out for the exercise you do (it is not catching up to the exercise you do). In those exercises we loan [that breath], so as such I was making up stories to tell the kids. (PLC meeting-6)

Öğretmen 4: Yaparak yaşayarak öğrenme en etkili öğrenme sizde biliyorsunuz. Ben orada aerobik ve anaerobik yürüyerek ve koşturarak çok net bir şekilde anlamalarını sağlamıştım zaten. Geçen hafta cuma günü sınıfa yarışma yaptırdım. Onlara nefes almanın egzersizdeki etkisini anlatmaya çalışırken dedim ki bazen nefesimiz yetmez

dedim, yaptığımız egzersize yetişmez dedim. O egzersizlerde biz bir borca gireriz gibisinden, yani biraz hikayeleştirerek anlattım çocuklara. (MGT toplantısı-6)

Teacher 2: During the lesson, let me give an example, if we are learning about atletizm topics and these children are running, strike while the iron is hot, then I could give [the idea of] aerobic endurance in the knowledge tests there to the kid. So, or in the lesson of short distance racing, in short distance racing I explained (conveyed) [better] to the child that there is an endurance that is anaerobic or it is a run without respiration. I tried to give the tip information that is related to that topic in the heat of that moment during the implementation and give it in a question-answer form. (PLC meeting-6)

Öğretmen 2: Ders yaparken de o gün örnek veriyorum işte atletizm konusunu işliyorsak eğer ve bu çocuklar sıcağı sıcağına koştuğu vakit orada bilgi testlerinden ben aerobik dayanıklılığı verebildim çocuğa. Yani ya da kısa mesafe koşu dersinde kısa mesafe koşarken çocuk oradaki dayanıklılığın anaerobik ya da oksijensiz koşu olduğunu ilettim. Konuya uygun hap bilgileri hemen sıcağı sıcağına uygulama sırasında hepsine ıı soru-cevap şeklinde alarak vermeye çalıştım. (MGT toplantısı-6)

Teacher 1: Some of them [the topics], I explained it on the board for better comprehension. So, marathon runners are running aerobics that have oxygen, another runs in the short distance race without oxygen. And then, when we were out for the lesson, they run in pairs as fast and slow. So we talked about what they were. Showing a crouch start and high output, I made them run a 30 meters. [Then I asked] how is your breath? What happened now? Why do you think this happened? Did we do aerobics or anaerobics? In that way we reinforced [this knowledge]. (PLC meeting-6)

Öğretmen 1: Bazılarını konu gibi anlattım tahtada daha iyi anlaşılması için. İşte maratoncu aerobik oksijenli koşar, öbürü oksijensiz koşar kısa mesafe. Ondan sonra derse çıktığımızda ikişerli hızlı ve yavaş koştular. İşte onların ne olduğunu konuştuk. Alçak yüksek çıkış gösterip, bir 30 metre koşturdum. Nasıl nefesiniz, çok mu? Ne oldu şimdi? Niye böyle oldu sizce? Aerobik mi yaptık, anaerobik mi yaptık? O şekilde pekiştirdik. (MGT toplantısı-6).

Teacher 6: When they were out of breath in the class during the activity, I stopped them and [said] how does this heartbeat calculation work? Let's measure it something like that and we measured it like this 15 times 4. I said that see, do you remember the heartbeat number, there was a question in the test? So maybe you have been exercising now, have you reached the max heartbeat number? Or is it that reaching a high beating number, per se, your heart beating very fast means that you did a good exercise and such questions informed [them]. (PLC meeting-6)

Öğretmen 6: Derste bir aktivite halindeyken böyle nefes nefese kaldıklarında bir durdurup, arkadaşlar bu kalp atım sayısı nasıl oluyor? Hani bir ölçelim mi falan filan yapıp böyle 15 çarpı 4 şeklinde birkaç öyle ölçtüğümüz oldu. Bakın dedim kalp atım sayısını hatırlıyor musun testte bir soru vardı? Acaba şimdi sen egzersiz yapıyorsun, atım sayısına ulaştın mı? Ya da çok atım sayısına ulaşman hani çok hızlı atması senin iyi bir egzersiz yaptığın anlamına mı geliyor şeklinde sorularla bilgilendirdik. (MGT toplantısı-6)

Regarding interdisciplinary cooperation, teachers also cooperated with science teachers in transferring knowledge regarding HrF. They shared the resources with their

colleagues and asked to use them as a preliminary to student learning in their lessons. Teacher applications are as follows;

> *Teacher 2: I have spoken to the science teacher. Do you, I said, use these terms? So, aerobics, anaerobics, respiratory system, circulatory system is closely related with physical education [class]. I shared the theoretical documents that you gave me. I said that you could include [this] in your topic [or] unit, I said that you could contribute to students' knowledge. She, thank her, has been really helpful. We have been contributed by her so much. (Interview)*
>
> *Öğretmen 2: Fen bilgisi öğretmeni ile görüştüm. Siz dedim bu terimleri kullanıyor musunuz? İşte anaerobiktir, anaerobiktir, solunum sistemi, dolaşım sistemi beden eğitimi ile çok alakalı. Bana verdiğiniz o teorik dokümanları onunla paylaştım. Hocam konunuza, ünitenize dahil edebilirseniz çocukların bilgisine katkı sağlarsınız dedim. O sağ olsun çok yardımcı oldu. Ondan önemli derecede katkı aldık. (Görüşme)*
>
> *Teacher 6: I said, once in a while can you also give information, aerobics, anaerobics every now and then can you do that (can you put in your lessons), the children's learning will consolidate. Thanks to them, they do not turn us down. (Interview)*
>
> *Öğretmen 6: Fen öğretmenleriyle de konuştum. Bizim kaynaklardan onlara birer tane verdim. Dedim hocam arada hani bunlarla ilgili siz de bilgi verirseniz, aerobik anaerobik araya siz de yerleştirirseniz, çocukların öğrenmesi pekişir. Sağ olsunlar kırmıyorlar bizi. (Görüşme)*

RQ. 2b. How do teachers' participation in the DBDM-PD program structured as a PLC affect their students' HrF knowledge and physical activity level?

The quantitative results of this research question were gathered from the HrF knowledge test and PAQ-C for examining students' learning.

4.2.1. Descriptive Statistics of the HrF Knowledge Level

The data was obtained to investigate whether there is a significant effect of teachers' participation in the DBDM-PD program on the HrF knowledge level of their students. Firstly, descriptive statistics were applied, and the means and standard deviations were summarized in Table 4.1. A total of 258 secondary school students (135 in the experimental group, 123 in the control group) carried out the "Health Related Fitness Knowledge Test for Middle School Students" before and after the DBDM intervention. According to pre-test results, students in the control group reported higher HrF knowledge test scores (M = 24.21, SD = 3.66) than students in the

experimental group (*M* = 24.07, *SD* = 4.40). In terms of post-test results, the HrF knowledge test score of students in the experimental group (*M* = 27.59, *SD* = 3.98) was higher than those in the control group (*M* = 24.54, *SD* = 4.47). It seems that HrF knowledge level increased in both groups, but the students in the experimental group increased it more than the other group. The total HrF knowledge score of all students in the post-test (*M* = 26.14, *SD* = 4.48) was higher than that in the pre-test (*M* = 24.14, *SD* = 4.06).

Table 4. 1. Descriptive statistics for HrF knowledge level of students

	Group	*M*	*SD*	*N*
PreTest	Experimental	24.07	4.40	135
	Control	24.21	3.66	123
	Total	24.14	4.06	258
PostTest	Experimental	27.59	3.98	135
	Control	24.54	4.47	123
	Total	26.14	4.48	258

4.2.2. Mixed Design ANOVA for HrF Knowledge Level

A mixed between-within subject ANOVA was used to examine the effect of teachers' participation in the DBDM-PD program on the HrF knowledge scores of their students (Tabachnick & Fidell, 2013).

4.2.2.1. Assumptions of Mixed Design ANOVA for HrF Knowledge

According to Pallant (2016), there are some common assumptions that perform all of the parametric tests and additional assumptions related to specific techniques. In this study, the assumptions, including sample size criterion, influential observation (outlier), normality, homogeneity of variance/covariance matrices, and homogeneity of variance were checked before the main analysis (Tabachnich & Fidell, 2013).

Sample size criterion: The power of a test is very dependent on the sample size used in the study (Pallant, 2016). G*Power software (3.1) was used to find how large the sample size of this study needs to be to achieve sufficient power. The estimated effect

size of .30 was used to detect the sample size (Cohen, 1988). An estimated sample size of at least 24 participants was recommended to observe statistical significance at the .05 alpha level with an estimated power level of .80. The participants of this research question were 258 students in total, 135 in the experimental group and 123 in the control group.

Influential observation (outlier): For univariate outliers, z-scores, %5 trimmed mean values, box plots, and histograms were checked, respectively. Cases with z-scores in excess of 3.29 ($p < .001$, two-tailed test) are potential outliers (Tabachnick & Fidell, 2013). However, there were no cases greater than 3.29. A trimmed mean is simply a mean based on the distribution of scores after some percentage of scores has been removed from each extreme of the distribution (Field, 2009). The original means and new trimmed means were compared and revealed that the extreme scores have no strong effect on the means. According to box plots, six scores in the pretest and three scores in the post-test of the experimental group seem as outliers. Histograms also have some discrete scores in the pre-test of the experimental group and in the post-test for both groups. However, cases were examined individually and did not affect the results of the main analysis. Therefore, they were included in the present study.

Normality: In order to test normality, Kolmogorov-Smirnov and Shapiro-Wilk tests (K-S), Skewness and Kurtosis values, histograms, and Q-Q plots were applied (Field, 2009).

The K-S assesses whether a distribution of scores significantly differs from a normal distribution. A significant value shows a deviation from normality, $p > .05$ (Field, 2009). The results of K-S revealed that *p* values for both groups were significant except for the pretest knowledge score of students in the control group at the Shapiro-Wilk test ($p < .05$) which means that there was a violation of the normality assumption (Table 4.2). However, this test is notoriously affected by large samples in which small deviations from normality yield significant results (Field, 2009).

The skewness and kurtosis values give information about symmetry and the "peakedness" of the distribution, respectively (Pallant, 2016). The further the value is from zero, the more likely it is that the data are not normally distributed (Field, 2009).

These values for both groups were close to zero which means there was no violation of the assumption (Table 4.3).

Table 4. 2. Kolmogorov-Smirnov & Shapiro-Wilks tests results of HrF knowledge

		Kolmogorov-Smirnov			Shapiro-Wilk		
	Group	*Statistic*	*df*	*p*	*Statistic*	*df*	*p*
PreTest	Experimental	.15	135	.00*	.97	135	.00*
	Control	.09	123	.03*	.98	123	.14
PostTest	Experimental	.13	135	.00*	.95	135	.00*
	Control	.10	123	.00*	.97	123	.01*

$p > .05$

The histogram is a graphical display of a single variable's distribution (Hair, 1195). Histograms demonstrated no serious violation when the shape of their bars was examined (see Appendix N). The Q-Q plots are used to examine the shapes of distribution and the observed values (the dots) should follow the line properly (Field, 2009). The dots were found close to the line and there were no extreme scores for groups (see Appendix N) but there was only one minor deviation in the post-test of the experimental group. Overall, it can be said that the normality assumptions for the HrF knowledge scores of both groups have not been violated.

Table 4. 3. Skewness and kurtosis tests results of HrF knowledge

	Groups	*Skewness*	*Kurtosis*
PreTestKnowledge	Experimental	-.45	.52
	Control	-.06	-.59
PostTestKnowledge	Experimental	-.92	1.62
	Control	-.45	-.17

Homogeneity of variance/covariance matrices: The assumption was assessed by Box's M Test of Equality of Covariance Matrices. The Box's M test should be non-significant if the matrices are equal (Field, 2009). The test result indicated that there were significant differences between the covariance matrices. Therefore, the homogeneity of variance/covariance matrices assumption was violated for HrF knowledge level ($p < .05$), and dependent variables were not equal across groups so Pillai's trace was utilized in the multivariate test (Tabachnick & Fidell, 2013). According to Leech et al. (2005), Pillai's trace is the best multivariate statistic to apply if this assumption is violated and group sizes are similar.

Homogeneity of variance: The Levene's Test of Equality of Error Variance was applied to check the homogeneity of variance assumption. This assumption means that each of the samples comes from populations with the same variance. A significant result shows that the variances are not equal (Field, 2009). The results of the test were found non-significant ($p > .05$) and given in the Table 4.4. Therefore, homogeneity of variance assumption has not been violated (For pre-test knowledge F (1, 256) = .73, $p > .05$; for post-test knowledge F (1, 256) = 2.75, $p > .05$).

Table 4. 4. Levene's test of equality of error wariances for HrF knowledge

	F	*df1*	*df2*
PreTestKnowledge	.73	1	256
PostTestKnowledge	2.75	1	256

p > .05

4.2.2.2. Main analysis of Mixed Design ANOVA for HrF Knowledge

The mixed design ANOVA was used to explore if there is a statistically significant difference between the pre-test and post-test HrF knowledge scores of experimental and control group students. The results revealed that the interaction effect was significant between time and group, Pillai's trace = .12, F (1, 256) = 37.59, $p < .05$, η^2 = .12, medium effect (Cohen, 1988) (Table 4.5). In other words, there was a change in the HrF knowledge scores of students over time for both groups. The main effect for time was significant, Pillai's trace = .17, F (1, 256) = 54.93, $p < .05$, η^2 = .17, large effect (Cohen, 1988). There was a significant difference between the post-test and pre-test HrF knowledge scores of all students, regardless of the group. In addition, the main effect for group was significant, F (1, 256) = 10.59, $p < .05$, η^2 = .04, small effect (Cohen, 1988). It showed that the sum of the pre-test and post-test HrF knowledge scores of the experimental group was significantly different from that of the control group. As in Figure 4.3. the groups HrF knowledge score means which were close to each other in the pre-test ($M_{Experimental}$ = 24.07, $M_{Control}$ = 24.21) differed in favor of the experimental group in the post-test ($M_{Experimental}$ = 27.59, $M_{Control}$ = 24.54). It can be concluded that teachers' participation in the DBDM-PD program is effective in improving their students' HrF knowledge level. It concluded that the intervention has a significant influence on the improvement of students' HrF knowledge levels.

Table 4. 5. ANOVA summary table of HrF knowledge level

Source	*SS*	*df*	*MS*	*F*	η^2
Time	479.289	1	479.289	54.93*	.17
Time * Group	328.002	1	328.002	37.59*	.12
Error	2233.496	256	8.725		

*$p < .05$

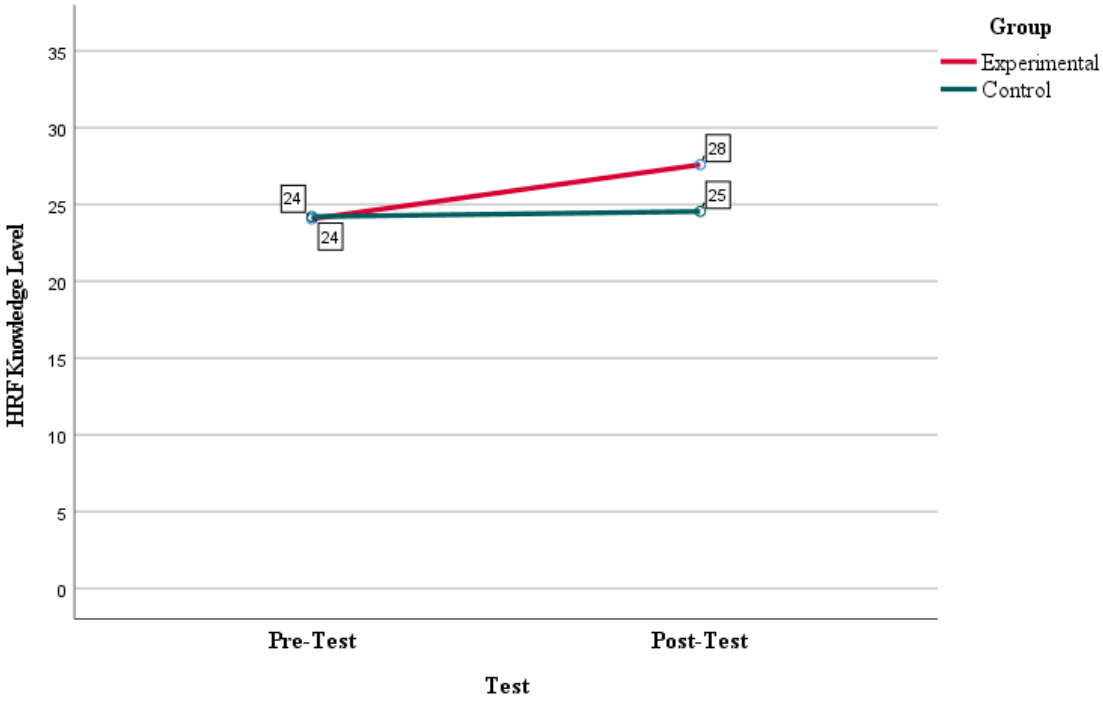


Figure 4. 3. Graphic of tests of between-subjects effects for HrF knowledge

4.3.1. Descriptive Statistics of the Physical Activity Level

The data were collected to examine whether there is a significant effect of teachers' participation in the DBDM-PD program on their students' physical activity level. Descriptive statistics was the initial step in data analysis, and the results of it were presented as mean and standard deviations (Table 4.6). Totally, 165 secondary school students (95 in the experimental group, 70 in the control group) carried out the "Physical Activity Questionnaire for Older Children" before and after the DBDM intervention. The pre-test results revealed the physical activity level of students in the control group ($M = 2.99$, $SD = .69$) was higher than students in the experimental group ($M = 2.78$, $SD = .73$). However, the post-test results showed that students' physical

activity level in the experimental group (M = 3.08, SD = .72) was higher than students in the control group (M = 2.94, SD = .77). It is seen that while the physical activity participation level of students in the experimental group increased, the students in the control group decreased. In addition, total physical activity participation level of all students in pretest (M = 2.89, SD = .72) increased in the post-test (M = 3.02, SD = .75).

Table 4. 6. Descriptive statistics for physical activity level of students

	Group	*M*	*SD*	*N*
PretestPA	Experimental	2.78	.73	95
	Control	2.99	.69	70
	Total	2.87	.72	165
PosttestPA	Experimental	3.08	.72	95
	Control	2.94	.77	70
	Total	3.02	.75	165

4.3.2. Mixed Design ANOVA for Physical Activity Level

A mixed between-within subject ANOVA was utilized to assess how teachers' participation in the DBDM-PD program affects the physical activity level of their students (Tabachnick & Fidell, 2013).

4.3.2.1. Assumptions of Mixed Design ANOVA for Physical Activity

Firstly, some assumptions were satisfied prior to the main analysis. These assumptions were sample size criterion, outliers, normality, homogeneity of variance/covariance matrices, and homogeneity of variance (Tabachnick & Fidell, 2013).

Sample size criterion: G*power (a computer program) is used for deciding how many participants should be enough to reach the desired level of power (Field, 2009). It was applied for calculating the sample size in this study. The sample size was identified by utilizing the estimated effect size of .30 (Cohen, 1988). An estimated sample size of at least 24 participants was recommended to observe statistical significance at the .05 alpha level with an estimated power level of .80. In addition, Stevens (1996) stated that if the sample size is large such as 100 and more participants, power is not an issue

(Pallant, 2016). The participants of this research question consisted of a total of 165 students, 95 in the experimental group and 70 in the control group.

Influential observation (outlier): The univariate outliers including z-scores, %5 trimmed mean values, box plots, and histograms were validated respectively. As for z-sores, no cases were greater than 3.29 (Tabachnick & Fidell, 2013). There was no difference between means and trimmed means, that is to say, the means were not affected by the extreme scores (Field, 2009). In terms of box plots, only one case in the post-test of the experimental group seems an outlier. According to histograms, there were discrete cases in the pretest of both groups. After individual analysis, it was revealed that the cases did not affect the main results and they were included in the study.

Normality: The Kolmogorov-Smirnov and Shapiro-Wilk tests (K-S), Skewness and Kurtosis values, histograms and Q-Q plots were used to check normality (Field, 2009).

In the Kolmogorov-Smirnov and Shapiro-Wilk test, p values for both groups were found higher than .05, $p > .05$ (Table 4.7). The skewness and kurtosis values of both groups were close to zero (Table 4.8). The histograms demonstrated normal distribution because no serious violation was inspected the shape of them (see Appendix N). For the Q-Q plots, the dots were centered on the line and there were no extreme scores except for three cases in the pre-test of the experimental group (see Appendix N). Overall, there is no serious violation of the normality assumption. It can be concluded that the normality assumptions have not been violated.

Homogeneity of variance/covariance matrices: The Box's M test was applied to check this assumption. According to Field (2009), the test should not be significant to indicate matrices equality. The result of the test showed that there were no significant differences between the covariance matrices, and the homogeneity of variance/covariance matrices assumption was satisfied in terms of physical activity level ($p > .05$).

Table 4. 7. Kolmogorov-Smirnov & Shapiro-Wilks tests results of physical activity level

		Kolmogorov-Smirnov			Shapiro-Wilk		
	Group	*Statistic*	*df*	*p*	*Statistic*	*df*	*p*
PreTestPA	Experimental	.08	95	.18	.98	95	.29
	Control	.07	70	.20	.99	70	.89
PostTestPA	Experimental	.05	95	.20	.99	95	.81
	Control	.09	70	.20	.98	70	.17

p >. 05

Table 4. 8. Skewness and kurtosis tests result of physical activiy level

	Groups	*Skewness*	*Kurtosis*
PreTestPA	Experimental	.41	-.04
	Control	-.16	-.27
PostTestPA	Experimental	-.14	-.16
	Control	-.37	-.69

Homogeneity of variance (Levene test): This assumption was checked by Levene's test. The test should be non-significant means the variances of the groups' scores are equivalent. Therefore, the assumption is acceptable (Field, 2009). The test results were found non-significant ($p > .05$) and presented in Table 4.9. In conclusion, the homogeneity of variance assumption has not been violated (For pre-test physical activity, F (1, 163) = .02, $p > .05$; for post-test physical activity, F (1, 163) = 1.22, $p >$ .05).

Table 4. 9. Levene's test of equality of error variances for physical activity level

	F	*df1*	*df2*
PreTestPA	.02	1	163
PostTestPA	1.22	1	163

p > .05

4.3.2.2. Main Analysis of Mixed Design ANOVA for Physical Activity Level

The mixed design ANOVA was used to examine whether there is a statistically significant difference between the pre-test and post-test physical activity levels of experimental and control group students. The results showed that the interaction effect

was significant between time and group, meaning that there was a change in physical activity levels of students over time for both groups, Wilks' Lambda = .93, F (1, 163) = 11.65, $p < .05$, $\eta^2 = .07$, medium effect (Cohen, 1988) (Table 4.10). The main effect for time was significant, Wilks' Lambda = .96, F (1, 163) = 5.30, $p < .05$, $\eta^2 = .03$, small effect (Cohen, 1988). There was a significant difference between the post-test and pre-test physical activity levels of all students, regardless of the group. However, there was no significant main effect for group F (1, 163) = .11, $p > .05$ (see Figure 4.4). In conclusion, teachers' participation in the DBDM-PD program has a significant influence on the development of their students' physical activity levels.

Table 4. 10. ANOVA summary table of physical activity level

Source	*SS*	*df*	*MS*	*F*	η^2
Time	1.200	1	1.200	5.30*	.03
Time * Group	2.636	1	2.636	11.65*	.07
Error	36.895	163	.226		

*$p < .05$

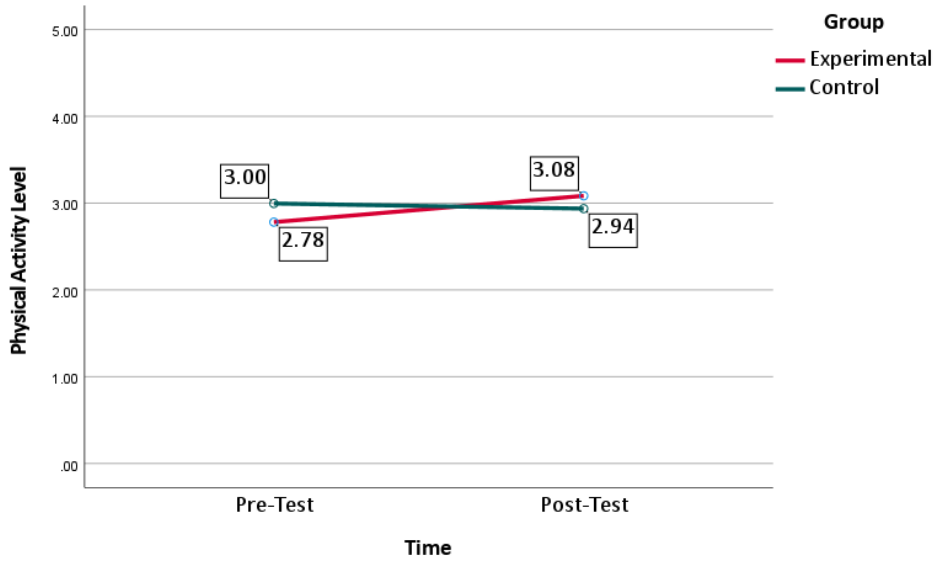


Figure 4. 4 . Graphic of tests of between-subjects effects for physical activity level

4.3. Research Question 3

RQ. 3. What are the teachers' views on design, implementation and outcome the DBDM-PD program?

For this research question, the qualitative data were obtained from semi-structured interviews after the intervention and 6th week PLC video recordings. The theme DBDM-PD program evaluation and three categories (design, implementation, and outcome of the PD program) emerged from research question (see Figure 4.5).

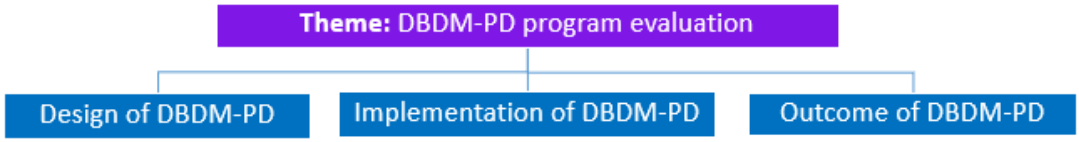


Figure 4. 5. Themes for research question 3

Design of the DBDM-PD program: According to the interview findings, the teachers were satisfied with the content and planning of the professional development program. The teachers stated that the content was satisfactory, complemented each other and was explained from general to specific. They also stated that they learned from their colleagues in the PLC about the topics discussed in the meetings and that they gained a lot from the Microsoft Excel training.

> *Teacher 5: Every week there were topics that completed each other. An explanation method from general to specific was adopted and it was nice. As it was nice to have been explained what we did what [and] why we did it from general to specific.*
>
> *Öğretmen 5: Her hafta birbirini tamamlayan konulardı. Genelden özele doğru bir anlatım tarzı benimsendi, bu da güzeldi. Yani neyi niçin yaptığımızı en genelden en özele inerek anlatılması güzel oldu.*
>
> *Teacher 6: We covered the excel program. I partially knew it, not a hundred percent but it has so much that contributed to me.*
>
> *Öğretmen 6: Excel programının üzerinden geçtik. Ben kısmen biliyordum, yüzde yüz değil fakat bana kattığı çok şey oldu.*
>
> *Teacher 3: The meeting was very abounding in every way. I gave myself feedback, took notes with both the shareholders and what they have done.*

Öğretmen 3: Toplantının içeriği dolu doluydu her bakımdan. Hem paydaşlarla ilgili hem onların yaptıklarıyla ilgili ben kendime geri dönütler aldım, notlar aldım.

Implementation of the DBDM-PD program: This category contains three sub-categories that are content sharing, resources, and social and physical setting. Teachers stated that *sharing the content* of the program by a facilitator who is an expert in the physical education field is effective. It is understood that the facilitator's professional knowledge, experience, time and setting management, and presenting different perspectives, and presentation skills are important. Quotations in teacher opinions are as follows:

Teacher 3: Our instructor has a grasp of the topic. [He is] a person that is on the factory floor (comes out of that professions' kitchen) and believe it or not we couldn't have taken that instruction anywhere else because he was the one organizing the making of the education program…Sometimes we left off from the topic, there he was recollecting it or he provided (presented) us with different perspectives, we commentated the topics from there too.

Öğretmen 3: Hocamız konuya hakim. Bir de bu işin mutfağından gelen bir kişi ve öğretim programının yapımında düzenlenmesinde kendisi olduğu için inanın başka bir yerde bu eğitimi alamazdık…Bazen konudan uzaklaşıyorduk, orada toplayıcı oluyordu. Veyahut bize değişik bakış açıları sunuyor, biz tekrar konuları oradan da değerlendiriyorduk.

Teacher 5: I was content with the instructor' diction, oratory, disposition of the topics and his knowledge accretion. It was nice for him to guide us.

Öğretmen 5: Hocamızın diksiyonu olsun, hitabeti olsun, konulara eğilimi olsun ve bilgi birikimi olsun, beni şahsen tatmin etti. Bize yol göstermesi de güzeldi.

Teacher 4: The instructor, frankly, guided the meetings very well with an approach that goes from general to specific and with all the years of experience. His presence is a huge plus, in my humble opinion.

Öğretmen 4: Eğitmen açıkçası genelden özele doğru giden bir yaklaşımla ve yılların tecrübesiyle toplantıları çok iyi yönlendirdi. Onun varlığı bir kere çok büyük bir artı ı naçizane fikrim.

Teacher 2: The timing of the organization, the management of time was very good.
Öğretmen 2: Organizasyonun zamanlaması, zaman yönetimi çok iyiydi.

Teacher 1: It was nice. My perspective has shifted to another opinion every time instructor has passed a remark (every said sentence).

Öğretmen 1: Çok güzeldi. Yani kolaylaştırıcının her ağzından çıkan cümlede benim bakış açım başka yere kaydı

Resources: Teachers had positive thoughts about the written and digital resources (articles, books, HrF knowledge, reports, videos, and presentations) provided to them.

Teachers stated that the resources were appreciated both by themselves and by students and parents. In particular, it was stated that written sources were effective in remembering some concepts and explaining them simply, and that the shared videos were both up-to-date and instructive in accordance with the conditions of the time. Teachers benefited from these resources for instructional purposes. They articulated that;

> *Teacher 3: I used the resources. I was thinking of what activities I will do in the evenings when I was assigning students about HrF. The video activities you have sent me have been really beneficial for me.*
>
> *Öğretmen 3: Ben kaynakları kullandım. Fiziksel uygunlukla ilgili öğrencileri görevlendirirken akşam hangi etkinlikleri yapacağım diye düşünüyordum. Göndermiş olduğunuz video etkinliklerinin bana çok faydası oldu.*
>
> *Teacher 5: I examined all of them, all are nice. Especially the links you have given us where the exercises the children could do at home, have been regarded by parents and teachers. I believe it is useful, it will contribute to our development.*
>
> *Öğretmen 5: Hepsini inceledim, hepsi güzel kaynaklar. Özellikle bize vermiş olduğunuz linkler çocukların evde yapabileceği egzersizler, veliler ve öğrenciler tarafından beğenildi. Kullanışlı olduğuna inanıyorum, gelişimimize katkı sağlayacaktır.*
>
> *Teacher 4: I have read especially the written resources with will and delight. There, some concepts were in a very clear manner both to remember and that provided us to learn them in a way to describe them in a much simpler manner. I liked that.*
>
> *Öğretmen 4: Özellikle yazılı kaynaklarınızı istekle ve keyif alarak okudum. Orada çok net bir şekilde bazı kavramların hem hatırlamamızı hem de daha yalın bir şekilde tanımlanabilecek bir halde olduklarını öğrenmemizi sağladı. Benim hoşuma gitti.*
>
> *Teacher 2: The videos that you have shared have been very educational. I already shared it with the children. Those videos are both up-to-date videos and also videos that are compatible with recent conditions, today's conditions… I can say that I was very nourished from these videos.*
>
> *Öğretmen 2: Paylaştığınız videolar çok öğretici oldu. Zaten paylaştım ben, çocuklarla da. O videolar hem güncel videolar hem de zamanın şartlarına, günün şartlarına uygun videolar… Bu videolardan çok beslendiğimi söyleyebilirim.*

On the other hand, the teachers suggestedmore activity videos and application examples from the field that they can use in the lessons should be presented at the meetings.

> *Teacher 5: For example, what can we do more in the lessons, [it could be that one can] go to a school, videos shot (taken as visuals), and be watched in the meetings for*

us. Look, we did this application for this, the application for this. To present a sample for us.
Öğretmen 5: Mesela derslerde daha çok ne yapılabiliriz bir okula gidip, görsel olarak çekilip, toplantıda izletilebilir bize mesela. Bakın bu uygulamayı yaptık bunun için, bu uygulama yaptık bunun için. Bize de örnek oluşturması açısından.

Teacher 4: Although, in the meetings, even if this profession has books, even if there are sample activities, because schools don't have a standard opportunity, resource isn't present for us such as applicable activities could be brought up… It could be covered and shown in visuals in a way that there could be these [types of] activities [and such].

Öğretmen 4: Toplantılarda hani her ne kadar bu işin kitabı olsa da orada etkinlik örnekleri olsa da, okulların standart bir imkan, olanak seviyesi olmadığı için bize orada mesela uygulanabilecek etkinlik örnekleri ortaya çıkarılabilir…Orada şu etkinlikler yapılabilir şeklinde üzerinde durularak ya da görsele yansıtılarak…

Social and physical setting: It is understood that holding PLC meetings in a university environment supports teachers' professional development motivation. It was stated that conducting a scientific study in an academic setting is purposeful. They expressed that:

Teacher 5: The meetings being in the university environment was nice for us. So, at least, if it was a scientific research, it should be in a scientific environment… For me, [the meetings] being in the university was a resource for a very positive reinforcement.

Öğretmen 5: Toplantıların üniversite ortamında olması bizim için güzeldi. Yani en azından, bilimsel bir çalışma yapılıyorsa bilimsel bir ortamda olması gerekiyordu…Benim için üniversitede olması gayet olumlu bir motivasyon kaynağıydı.

Teacher 4: All the process already being under the roof of a university [institute] made us get a groove on (got us to put on airs), increased the motivation.

Öğretmen 4: Bütün bu sürecin zaten bir üniversite çatısı altında olması bizi havaya soktu, motivasyonu arttırdı.

Teacher 6: METU, the university has a different atmosphere. Doing something like this in the university is of course very different.

Öğretmen 6: ODTÜ'nün üniversitenin kendi bir havası var. Üniversitede bu tarz bir şey yapmak tabi daha farklı.

Teacher 2: For an academic study to be in the university is goal oriented. So, the university environment is already convenient for this type of research and these types of meetings also… Being there has given us delight.

Öğretmen 2: Akademik bir çalışmanın üniversitede olması bence amaca dönük. Yani üniversite ortamı da zaten bu tip araştırmalara bu tip görüşmelere müsait bir ortam… Orada bulunmuş olmak bize keyif verdi.

Teachers emphasized that the social environment is one in which they can express themselves freely, where energy and synergy are high and where colleagues are united by the same goals and objectives. They expressed their satisfaction with the social environment as follows:

> *Teacher 1: It was good, very good. The team was nice, the environment was nice. We were a group that was joyful, delightful, energetic. There was a synergy.*
>
> *Öğretmen 1: Güzeldi, çok güzeldi. Ekip güzeldi, ortam güzeldi. Neşeli, keyifli, enerjik bir gruptuk. Sinerji vardı.*
>
> *Teacher 2: In an environment where being with friends that think alike me in which I can express myself was already that is relaxing. The opportunity to nourish from [with the help of] instructor, now that is some of the things that eased me.*
>
> *Öğretmen 2: Kendimi ifade edebileceğim bir ortamda benim gibi düşünen arkadaşların birlikte olması zaten bir rahatlık verici. Mustafa hocadan beslenebilme fırsatı bir kere bunlar beni rahatlatan şeyler.*
>
> *Teacher 4: Obviously I should say this, in the first week I found myself [in a state that] my feet were going backwards to be honest. But, that feeling flew away just when I entered the meeting. Both the warm environment there, and the presence of 6-7 people whom I believed that came here for the sake of contributing something eliminated that after-labor hardships [of coming here], actually.*
>
> *Öğretmen 4: Açıkçası şunu söyleyeyim, ilk hafta ayaklarım geri geri gelirken kendimi buldum, samimi olmak gerekirse. Ama toplantıya girdiğim andan itibaren o duygu uçtu gitti. Hem oradaki sıcak ortam hem gerçekten buraya bir şeyler katmak için gelmiş olduğuna inandığım 6-7 kişilik grubun varlığı o mesai sonrası zorluğu açıkçası elimine etti.*
>
> *Teacher 3: I was very calm. A person goes early to the place he loves, this is why I also was going early…But, the warmness of the environment has lured me in. I came fondly. The environment was very nice also.*
>
> *Öğretmen 3: Ben çok rahattım. İnsan sevdiği yere erken gider, ben de o yüzden erken geliyordum…Ama inan ortamın sıcaklığı beni içine çekti. Ben severek geldim. Ortam da çok güzeldi.*

The outcome of the professional development program: Teachers expressed the learning outcomes of the professional development program as follows:

> *Teacher 6: I carried out my instruction holistically, the individuality was not really forefront. Like, discriminating the individual needs of the kid, guiding him individually also outside of school for example, this was a new [type of] learning [experience] for me… [I saw that] there needed to be much more leaning towards the kids that didn't like sports, didn't like activities, individually, because you cannot make them do anything in school. But after that, as at nights, on weekends or in the time that he spared for himself, there was an awareness (learning) here that something should be planned or I needed to guide him when he is planning.*

Öğretmen 6: Ben okulda dersimi toplu olarak işlerdim, bireysellik çok ön planda değildi. Hani çocuğun bireysel ihtiyaçlarını ayırmayı, ona bireysel olarak okul dışında da yönlendirmek mesela o benim için yeni bir öğrenme oldu… Bu sporu sevmeyen, etkinliği sevmeyen çocuklara daha fazla eğilmem gerektiğini bireysel olarak, çünkü okulda bir şey yaptıramıyorsun. Ama daha sonraki işte akşam, hafta sonu ya da kendine ayırdığı diğer vakitlerde bir şeyler planlanması gerektiğini ya da benim onu planlarken onu yönlendirmem gerektiği bir öğrenme oldu burada.

Teacher 2: For once, there was awareness. Like, speaking for myself, the reason maybe my history of sportsmanship. I was always on the lookout for athletes… But, in respect of this education, it has more importance on the health conditions, and societal health started on from this point, in this perspective (goal) it raised an important consciousness. (it was an important awareness). My perspective in this respect has shifted (changed) profoundly (in the most important way). So now, being able to realize children that are obese, who cannot run or do a sprint has become important. As the instruction was effective for me to direct [my attention] to those in need.

Öğretmen 2: Hocam bir kere bir farkındalık oldu. Şöyle, benim kendi adıma belki sporcu geçmişimden kaynaklı olabilir. Benim gözüm hep yetenekli sporcuları görürdü… Fakat bu eğitim çerçevesinde biraz daha bunun sağlık yönünün önemli olduğunu, toplumsal sağlığın aslında bu noktadan gittiğini, bu amaçla önemli bir farkındalık oldu. Benim bakış açım bu anlamda önemli ölçüde değişti. Artık obez olan, işte koşamayan ya da sıçrayamayan çocukları görebilmek önemli oldu. Yani ihtiyacı olana yönelmemde çok etkili oldu bu eğitim.

Teacher 1: As being talked about some of the things needed in the meetings, the reasons (why) we do the HrF tests, the data… I never looked at my job from that perspective, these meetings have made sense of what I do. As I said, after starting with you, when we instructed the lessons, we started to look with a different perspective to the students, to the lesson… Like, how to redound on the children really, also outside of school, too, of course, I also think that lessons are sufficient but after the lesson for these [children], the meetings gave me insight (the meetings widened my horizons.)

Öğretmen 1: Toplantılarda konuşuldukça bazı şeylerin gerekliliği, fiziksel uygunluk testlerini niye yaptığımız, veriler... Daha önce hiç o gözle bakmamıştım yaptığım işe, yaptığım işi anlamlandırdı bu toplantılar. Dediğim gibi sizinle başladıktan sonra derse girdiğimizde başka bir bakış açısıyla bakmaya başlıyorsun öğrenciye, derse…Yani çocuklara nasıl dokunabileceğimizi aslında, okul dışında bir de o var, tabi dersler de yeterli olduğunu düşünüyordum ama ders sonrası için ya bunlara bir ufuk açtı bana o toplantılar.

Teacher 5: Like, for us to progress in terms of professionalism, this has been a step [forward]. We have taken that step (ascended a stair), of course, after this, we have to walk through it ourselves inevitably. For me, the most important was to use data. I learned that the rest will come around for sure.

Öğretmen 5: Yani bizim mesleki açıdan ilerlememiz de burası bir basamak oldu. O basamağa çıktık, tabi bundan sonrasını kendimiz yürütmek zorundayız ister istemez. Benim için en önemlisi veri kullanmaktı. Ben onu öğrendim, geri kalan mutlaka etrafına gelir yani.

CHAPTER 5

DISCUSSION

The purpose of this study was (1) to design a DBDM-PD for secondary school physical education teachers and (2) to examine the effects of this program on physical education teachers' data use and instructional practices and their students' learning. This chapter discusses the study findings for each research question following the relevant literature.

The first research question was about understanding the context and needs of teachers regarding DBDM (What are the practices and needs of physical education teachers with respect to data use? a. Which factors influence the data use of physical education teachers? b. For which purposes are data being used by physical education teachers?)

According to Schildkamp et al. (2017), data is mainly used for accountability, school improvement, and instructional decision-making. Studies to date indicated various influencing factors for teachers' data use (Coburn & Turner, 2011; Schildkamp & Kuiper, 2010; Schildkamp & Lai, 2013; Supovitz, 2010). According to the Schildkamp and Poortman's (2015), data use is influenced by data characteristics, user characteristics, and school organization characteristics. The findings of the first sub-question were grouped under Schildkamp et al. (2017) framework. Content analysis was used to analyze the semi-structured interviews with teachers before the study.

According to the *data characteristics* findings of the interviews, physical education teachers collected only HrF data (height, weight, push-ups, sit up, flexibility) from students and entered it into the e-school system. However, teachers have concerns about the quality of their HrF data collection for their limited competency in HrF tests. Accordingly, teachers need to be supported in obtaining valid and reliable data sources

they can use in physical education lessons. Several research back up the idea that the data that instructors have should be up to date and accurate (Datnow et al., 2007; Schildkamp & Kuiper, 2010; Wohlstetter et al., 2008). The researchers also stress the importance of having access to high-quality data and having multiple sources of data that are appropriate for the user's needs (Coburn & Turner, 2011). Teachers also mention their need for systematic data collection for grade-level student learning specified in the national curriculum (MoNE, 2018).

In terms of *user characteristics* findings, teachers need to improve data use knowledge and skills (analyzing, interpreting, reporting, and visualizing). Teachers need more information about why HrF data is collected and for what purpose. While teachers are included in the HrF data collection process (measurement), they are not included in the evaluation process. Therefore, the measurement and evaluation of the HrF may not make sense for teachers. In addition, teachers feel free to process student data using data processing/analyzing methods or applications (such as Microsoft Excel) and consider their skills in them insufficient. The lack of teacher data processing/analyzing skills also negatively affects the quality of their data interpretation and their ability to report data with effective visualization and present it to other stakeholders such as students, parents, teachers, and administrators (Kerr et al., 2006; Datnow et al., 2007; Ince et al., 2020; Schildkamp & Kuiper, 2010; van der Kleij & Eggen, 2013).

The findings of the *school organizational characteristics* showed that there is limited regulation or practice regarding the data use for physical education and sports lessons in schools except HrF data collection to submit e-school, and measurement and evaluation policies of MoNE that is rarely done in reality (MoNE, 2018). Even though there are some written measurement and evaluation policies of MoNE (2018) for instructional processes, the schools do not have a shared vision and norms regarding data use (except HrF reporting). There is a lack of communication among teachers and administrators for grade-level physical education curriculum student learning outcomes. In addition, according to teachers' reports, there is no available expert providing data use support in schools, and school administrators don't have expectations related to data use in physical education lessons except collecting HrF

data to enter into the e-school system for accountability purposes as stated with MoNE (2018).

The findings of *the second sub-question* (for which purposes are data being used by physical education teachers) reveal that physical education teachers systematically use data for meeting HrF reporting obligations and rarely for instructional purposes such as identifying students' learning needs, designing lessons, and monitoring student progress. In addition, the data are not used for school development purposes such as determining student success, annual school goals, or teachers' professional development needs.

There is a national curriculum (MoNE, 2018) to follow in physical education. In reality, neither curriculum nor measurement and evaluation policies are applied effectively in physical education classes by most teachers (Ince et al., 2020; Sirin et al., 2009; Genç, 2008). Ince and Hunuk (2013) found in their study that teachers lack enough knowledge about to measure and evaluate in physical education courses. Also, many research findings show that physical education teachers consider their own measurement and evaluation skills are insufficient (Erdemir, 2007; Ozgul & Kangalgil, 2018; Yilmaz & Gunduz, 2008).

This shows an accountability weakness in school physical education, and teachers do not feel responsible for collecting, analyzing, interpreting, and reporting data. This situation possibly causes the weakening of teachers' related knowledge and skills over time. Studies in other countries also indicate weak measurement and evaluation practices and a lack of accountability measures in physical education and sports (Borghouts et al., 2017; Khasawneh & Al-Khazaleh, 2014). Therefore, the stated problem is not the case for Turkey, and it is a global problem with respect to the practice of school physical education.

Overall, the findings of the first research question indicated that there is an immediate need for developing professional development programs for physical education teachers' data use knowledge and skills, including understanding the rationale behind data use, collecting data, analyzing data, interpreting data, creating reports with

effective visualization, and sharing reports with other stakeholders. Moreover, designing a DBDM-PD program with a specific focus on improving the instruction for identifying the student's learning needs, designing lessons, and monitoring the learning, might be more effective in improving school physical education teaching practices.

According to the author's information, no studies focus specifically on designing professional development programs for the data use knowledge and skills of physical education teachers. Professional development programs for data use competence in physical education teachers are usually packaged in programs related to "measurement and evaluation" (Hunuk et al., 2013; Ince & Hunuk, 2013). The literature review and the current study's findings on this subject show that the current "measurement and evaluation" programs offered to teacher candidates and in-service physical education teachers are ineffective in developing their relevant competencies (Arslan et al., 2013; Ince et al., 2020; Ozgul & Kangalgil, 2018; Sirin et al., 2009). Therefore, developing a data-use professional development program rooted in the practices and needs of physical education teachers might help improve the quality of educational practices in physical education.

Based on the findings of this needs analysis research question, a DBDM program through the PLC was designed and applied as stated in the methods chapter in the current study. The main focus of the design was developing the understanding of the rationale behind the data use for HrF and physical activity, collecting valid and reliable data, processing the data with a readily available data processing application (Microsoft Excel), interpreting the data, creating reports for stakeholders with effective visualization, and using the outcome to improve instruction at planning, content development, implementation, and measurement and evaluation. The rest of this chapter includes a discussion concerning the outcome of implementing the designed program through research questions two and three.

The second research question examines a) how a DBDM-PD program structured as a PLC affects the data use and instructional practices of teachers and b) their students' HrF knowledge and physical activity level.

For the first sub-question (2a), two themes emerged to reveal the effect of the intervention on teachers' data use and instructional practices: (1) The learning of teachers from the DBDM-PD program, (2) The instructional practices of teachers relating to DBDM.

Regarding teachers' learning from the DBDM-PD program, findings indicated that teachers' data use awareness for instruction and their professional knowledge and skills improved after the intervention. Teachers became aware that the data could be used for determining the student's learning needs, getting to know students, and increasing their awareness of their individual needs and motivation to participate in physical activity. In addition, teachers' professional knowledge and skills have improved by using technology in education, measurement and evaluation, content knowledge, and interdisciplinary bonding in the curriculum.

The findings of the instructional practices of teachers relating to DBDM showed that teachers designed and diversified their instructional practices based on students' physical activity and HrF knowledge data. As for *increasing physical activity*, teachers used various pedagogical strategies in and out of school. While in-school practices comprise recess and lunch break activities, pedometers, observation and interview, and data use in parent meetings, the out-of-school practices comprise various assignments/tasks and orientation to the various sports branches or activities. Teachers assigned students to use pedometers (smartwatches, phones), physical activity diaries, online resources (videos), and individual exercise plans.

Considering the DBDM-PD program design components (understanding the data use, collecting, analyzing, interpreting, reporting, and use of PLC) and the above-mentioned findings in this study, it can be said that the design and implementation of the program were successful in developing the awareness and knowledge as well as transferring the teachers learning into the physical education classes. Previous studies in physical education teacher competencies usually conclude weak content and pedagogical content knowledge of physical education teachers (Hunuk et al, 2013; Ince & Hunuk, 2013; Ince et al., 2020).

For example, Ince and Hunuk (2013) report the low HrF knowledge of experienced physical education teachers in Turkey. Studies by Castelli and Williams (2007) and Santiago et al. (2009) also stated similar weak content HrF knowledge of physical education teachers in other countries. Hunuk et al., (2013) presented the effectiveness of PLC in developing HrF content and pedagogical content knowledge of physical education teachers in a single case. Recently, Ince et al. (2020) have proposed an effective PLC approach for supporting teachers' HrF and physical activity content and pedagogical content knowledge in multiple cases in a large-scale study. The current study also shows that the data use intervention approach, when combined with the content of HrF and physical activity in a PLC, is effective in improving both teachers' data literacy and teachers' content and pedagogical content knowledge of HrF and physical activity.

The mechanism of the aforementioned positive effect of the data use intervention with PLC may be related to the need for a deep understanding of the data by the user (teacher) in this case. While working on the data use concept, teachers even had to analyze the characteristics of learners, social and physical settings, and HrF and physical activity-related educational policies in the context. In other words, teachers needed to develop an in-depth understanding of the HrF and physical activity data in the educational setting. Once the content and context became meaningful for teachers, developing content and pedagogical content knowledge on these topics was probably easier.

The quantitative data were gathered from the HrF knowledge test and physical activity survey for the second sub-question of the second research question and analyzed with mixed-design ANOVA. The results showed an increase in the students' HrF knowledge and physical activity level of the teachers participating in the PLC meetings. That means teachers' participation in the DBDM-PD program was effective in improving their students' HrF knowledge and physical activity. The improvement in the HrF knowledge and physical activity level of students can be considered as the reflection of the increase in the content knowledge of the teachers participating in the DBDM-PD program on the lesson and student learning.

There is evidence that teachers focus more on teaching sports-specific skills but need to transfer sufficient HrF knowledge to students in the physical education classes (Arslan et al., 2013; Avsar, 2009; Tekin & Tasgin, 2009; Yilmaz & Gunduz, 2008). The review of the available literature suggests that due to the inadequacy of physical education teachers' HrF knowledge and skills, they do not reflect these practices effectively in their lessons (Ince & Hunuk, 2013; Santiago et al., 2016; Yılmaz, 2019). Hunuk et al. (2013) found that as HrF knowledge of physical education teachers increased, so did their students' HrF knowledge.

One of the most critical outcomes of physical education is the development of regular lifetime physical activity participation, HrF, and overall well-being (MoNE, 2018; McKenzie & Khan, 2008). However, studies indicate a dramatic decrease in physical activity participation, HrF, and overall well-being of the school-age population within the last three decades (Álvarez & López, 2017; Kin-işler et al., 2009). This situation brings the effectiveness of current school physical education practices into questioning (Harris & Cale, 2018; Tannehill et al., 2013; Pot et al., 2018). The findings of the current research question indicate that when teachers participated in DBDM-PLC, they could transfer their learning into their classes. As a result, their students develop their HrF knowledge and physical activity level concretely.

As previously mentioned, DBDM involves several steps, starting with collecting student data, then teachers' analysis and interpretation of the assessment information, and finally, their adaptation of instruction based on the data. As a result, providing a better fit between the instruction and the student's needs is expected to affect student learning positively (Hoogland et al., 2016; Mandinach, 2012; van Geel et al., 2016). In this study, teachers' collecting and analyzing data on HrF knowledge, physical activity level, and specific deficiencies of the students and then designing their lessons according to those needs might have positively affected the students' HrF knowledge and physical activity levels.

In addition, discussing the subjects related to HrF and physical activity in the lessons, sharing them with visuals and various videos on the smart board, and transferring them during the activity in the lessons have reinforced student learning. DBDM

interventions on student achievement in other fields of education indicate an improvement in the reading comprehension of secondary school students (Lai et al., 2014) and the mathematics of primary school students (Andersson & Palm, 2017; Keuning & van Geel, 2016). This study is the first application of DBDM in physical education settings, and findings support the previous studies in other fields.

Overall, the findings of the second research question suggest that teachers' participation in DBDM-PLC is effective in improving teachers' content and pedagogical content knowledge as well as their students' HrF knowledge and engagement in physical activity.

For the third research question (What are the teachers' views on design, implementation and outcome the DBDM-PD program?), the qualitative data were obtained from semi-structured post-interviews and sixth-week PLC video recordings and analyzed by content analysis. The findings were discussed under the theme of DBDM-PD program evaluation, including the design, implementation (content sharing, resources, social and physical setting), and outcome of the professional development program.

According to DBDM-PD program evaluation findings, teachers declared their views on the design, implementation, and outcome of the PD program. In terms of the design of the professional development program, the teachers were satisfied with the content and planning of the intervention. As for the implementation of the professional development program, it found that *content sharing* by the field expert in PLC is effective.

It is understood that facilitator characteristics such as professional knowledge, experience, time and space management, and presenting different perspectives and presentation skills are essential. The *resources* (articles, books, HRF knowledge, reports, videos, and presentations) presented to the teachers in the professional development program were appreciated and used for instructional purposes by the teachers. However, it was suggested that more activity videos and application examples from the field should be presented in the professional development program.

In terms of the *social and physical setting*, the fact that PLC meetings are held in the university environment increased their motivation. The *outcome of the professional development program* has increased the belief and motivation of teachers in the profession of physical education and sports teaching; the professional development program enabled teachers to better understand the aims and objectives of the physical education and sports course; the importance of the HrF components of the course and its inclusiveness for all students was understood; the purpose and measurement and evaluation of HrF tests were understood; and teachers learned how to use data.

Teacher satisfaction and motivation to participate are essential aspects of successful learning in professional development programs (Ince et al., 2020; Ebbeler et al., 2017; Desimone, 2009). The findings of this research question indicated that the design and the way the DBDM-PD program implementation was satisfactory and motivating for the participant physical education teachers.

Overall, a needs assessment based on DBDM-PD program planning, implementation of the design with a theoretical framework behind it, and evaluation of the effectiveness of the program by considering teachers' satisfaction, teachers' learning outcomes, their transfer of learning into the class, and checking the learning of their student's thoroughly were the strengths of the current study.

CHAPTER 6

CONCLUSIONS & RECOMMENDATIONS

The conclusions that were reached for the study were presented for each research question as follows.

6.1. Research Question 1

RQ. 1. What are the practices and needs of physical education teachers with respect to data use?

6.1.1(a). Which factors influence the data use of physical education teachers?

The qualitative findings showed that physical education teachers' data use is affected by factors such as data characteristics, user characteristics, and school organizational characteristics.

In terms of *data characteristics* findings, physical education teachers submitted only HrF data (height, weight, push-ups, sit-ups, and flexibility) into the e-school system for accountability purposes. Despite their low proficiency in HrF tests, teachers are concerned about the quality of their HrF data collecting.

In light of user characteristics findings, teachers must enhance their expertise in data use knowledge and skills (analyzing, interpreting, reporting, and visualizing). Teachers require additional information regarding the reasons for and use of HrF data collection. Additionally, teachers view their proficiency in data processing skills and applications (such as Microsoft Excel) as lacking and feel free to process student data using them.

The findings of the study on school organizational characteristics revealed that, aside from the collecting of HrF data for submission to the e-school system, there is little regulation or practice pertaining to the use of data for physical education and sports lessons in schools. The schools lack a common vision and norms for the use of data (except HrF reporting). Teachers' reports also indicate that there is no expert accessible to support data use in the classroom and school, and administrators of the school have no expectations for data use in physical education lessons other than gathering HrF data to enter into the e-school system for accountability.

6.1.1(b). For which purposes are data being used by physical education teachers?

The findings showed that physical education teachers hardly use data for instructional purposes such as identifying students' learning needs, developing lesson plans, and tracking student progress. Instead, they routinely use data to fulfill HrF reporting requirements. Additionally, the data is not used to assess the requirements of teachers for professional development, to assess student progress, or to annual school goals.

Overall findings of the first research question suggest that professional development programs for physical education teachers' knowledge and skills in data use are urgently needed. These programs should cover understanding the justification for data use, gathering data, analyzing data, interpreting data, generating reports with effective visualization, and sharing reports with other stakeholders. Additionally, it might be more efficient to design a DBDM-PD with a specific focus on developing the instruction for identifying the students' learning needs, designing lessons, and tracking the learning. Therefore, designing a professional development program for data use that is based on the needs and practices of teachers may aid in raising the standard of instructional practices in physical education.

6.2. Research Question 2

RQ. 2. How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices, and their students' HrF knowledge and physical activity level?

6.2.1(2a). How does a DBDM-PD program structured as a PLC affect the teachers' data use and instructional practices?

Two themes emerged to show how the intervention affected data use and instructional practices of teachers: (1) The learning of teachers from the DBDM-PD program, (2) The instructional practices of teachers relating to DBDM.

Findings about teachers' learning from the DBDM-PD program showed that following the intervention, data use awareness of teachers for instruction and their professional knowledge and skills improved. Teachers learned that the data may be utilized to identify students' learning needs, get to know them, and raise awareness of each student's unique needs and incentive to engage in physical activity. The use of technology in education, measurement and evaluation, content knowledge, and interdisciplinary bonding in the curriculum has also strengthened teachers' professional knowledge and skills.

Teachers' DBDM-related instructional practices revealed that teachers designed and varied their lessons based on data about students' physical activity and HRF knowledge. Teachers employed a variety of pedagogical tactics both within and outside of the classroom to increase physical activity. While pedometers, lunchtime activities, observation and interviews, and presenting data in parent meetings are all part of in-school practices, out-of-school activities include a variety of assignments and responsibilities as well as introductions to the many sports branches or activities. Students were required to use pedometers (smartwatches, phones), activity logs, online resources (videos), and personal exercise plans by their teachers.

6.2.1(2b). How do teachers' participation in the DBDM-PD program structured as a PLC affect their students' HrF knowledge and physical activity level?

The results showed an increase in the students' HrF knowledge and physical activity level of the teachers participating in the PLC meetings. That means teachers' participation in the DBDM-PD program was effective in improving their students' HrF knowledge and physical activity.

Overall, the findings of the second research question suggest that teachers' participation in DBDM-PD program structured as PLC is effective in improving teachers' content and pedagogical content knowledge as well as their students' HrF knowledge and engagement in physical activity.

6.3. Research Question 3

RQ. 3. What are the teachers' views on design, implementation and outcome the DBDM-PD program?

The findings revealed teachers' opinions about the professional development program's design, implementation, and outcome. The teachers were pleased with the intervention's planning and content from the perspective of the program's design. Regarding the professional development program's implementation, it was discovered that the field expert's content sharing in PLC is successful.

It is acknowledged that important facilitator qualities include professional expertise, experience, managing time and space, presenting many points of view, and oratory. The teachers liked and utilized the resources in their lessons (articles, books, summary HrF knowledge, reports, videos, and presentations) provided to them as part of the professional development program. However, it was recommended that the professional development program include additional action videos and field application examples. The fact that PLC meetings take place in an academic context has enhanced teachers' motivation in terms of their social and physical environment. The professional development program helped teachers better understand the goals

and objectives of the physical education and sports course; the significance of the HrF components of the course and its inclusiveness for all students; the purpose and measurement and evaluation of HrF tests; and the outcome has increased teachers' belief and motivation in the profession of physical education and sports lessons.

The answers to this research question show that the physical education teachers were satisfied with the DBDM-PD program's design and implementation, which was also motivating.

Overall, the strengths of the current study were DBDM-PD program planning based on needs assessments, implementation of the design with a theoretical framework supporting it, and evaluation of the effectiveness of the program by taking into account teachers' satisfaction, teachers' learning, their transfer of learning into the class, and thoroughly checking the learning of their students.

6.4. Recommendations

- DBDM-PLCs consisting of teachers and administrators can be created for school development in schools.
- Data management systems used in schools can be made more useful for data processing of DBDM.
- Schools can be assigned data experts to support teachers' knowledge and skills in data use.
- Content knowledge and pedagogical content knowledge should be developed so that teachers can transfer the information they obtain from the data to their lessons
- The practices of teachers participating in the DBDM program can be examined through longitudinal studies.
- Pre-service teachers' data use skills can be improved in higher education programs
- Students can be involved in the data use process, and research can be conducted on the role of students in the data use process.

- This study can be applied in the other sub-learning domain of physical education and sports lesson.
- This study can guide professional development programs for other disciplines.
- This study has the potential to improve the data use knowledge and skills of in-service teachers.
- This study can be presented to in-service training for professional development in the field of physical education and sports.
- Determining in which areas students need improvement and increasing awareness of physical activity will guide the planning of physical education lessons.

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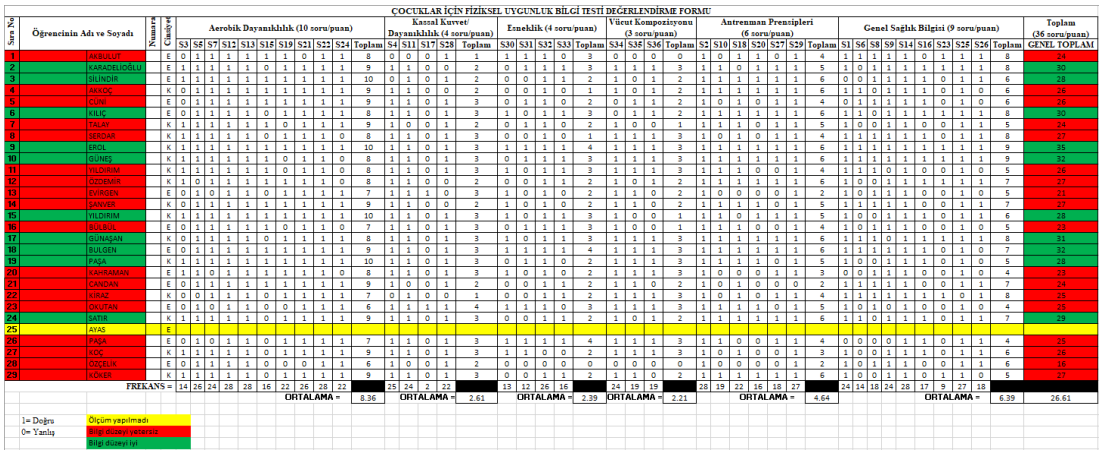
APPENDICES

A: EXAMPLES OF DATA PROCESSING IN MICROSOFT EXCEL



ÇOCUKLAR İÇİN FİZİKSEL UYGUNLUK BİLGİ TESTİ DEĞERLENDİRME FORMU

Sıra No	Öğrencinin Adı ve Soyadı	Numara	Cinsiyet	Aerobik Dayanıklılık (10 soru/puan)											Kassal Kuvvet/ Dayanıklılık (4 soru/puan)					Esneklik (4 soru/puan)					Vücut Kompozisyonu (3 soru/puan)					Antrenman Prensipleri (6 soru/puan)						Genel Sağlık Bilgisi (9 soru/puan)										Toplam (36 soru/puan)
				S3	S6	S7	S12	S13	S16	S19	S21	S22	S24	Toplam	S4	S11	S17	S28	Toplam	S30	S31	S32	S33	Toplam	S34	S35	S36	Toplam	S2	S10	S18	S20	S27	S29	Toplam	S1	S6	S8	S9	S14	S16	S23	S25	S26	Toplam	GENEL TOPLAM
1	AKBULUT		E	0	1	1	1	1	1	0	1	1	8	0	0	0	1	1	1	1	1	0	3	0	0	0	0	1	0	1	1	0	1	4	1	1	1	1	0	1	1	1	8	24
2	KARADELİOĞLU		E	1	1	1	1	1	0	1	1	1	9	1	1	0	0	2	0	1	1	1	3	1	1	1	3	1	1	0	1	1	1	5	1	0	1	1	1	1	1	1	8	30
3	SİLİNDİR		E	1	1	1	1	1	1	1	1	1	10	0	1	0	1	2	0	0	1	1	2	1	0	1	2	1	1	1	1	1	1	6	0	0	1	1	1	1	0	1	1	6	26
4	AKKOÇ		K	0	1	1	1	1	1	1	1	1	9	1	1	0	0	2	0	0	1	0	1	1	0	1	2	1	1	1	1	1	1	6	1	1	0	1	1	1	0	1	0	6	26
5	CÜNİ		E	0	1	1	1	1	1	1	1	1	9	1	1	0	1	3	0	1	1	0	2	0	1	1	2	1	0	1	0	1	1	4	0	1	1	1	1	1	0	1	0	6	26
6	KILIÇ		E	0	1	1	1	1	0	1	1	1	8	1	1	0	1	3	1	0	1	1	3	0	1	1	2	1	1	1	1	1	1	6	1	1	0	1	1	1	1	1	1	8	30
7	TALAY		K	1	1	1	1	1	0	1	1	1	9	1	0	0	1	2	0	1	1	0	2	1	1	0	2	1	1	1	1	0	1	5	1	0	0	1	1	0	0	1	1	5	24
8	SERDAR		K	1	1	1	1	1	0	1	1	1	8	1	1	0	1	3	0	0	1	0	1	1	1	1	3	1	0	1	0	1	1	4	1	1	1	1	1	1	0	1	1	8	27
9	EROL		K	1	1	1	1	1	1	1	1	1	10	1	1	0	1	3	1	1	1	1	4	1	1	1	3	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1	1	9	36
10	GÜNEŞ		K	1	1	1	1	1	0	1	1	0	8	1	1	0	1	3	0	1	1	1	3	1	1	1	3	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1	1	9	32
11	YILDIRIM		K	1	1	1	1	1	0	1	1	0	8	1	1	0	1	3	1	0	1	1	3	1	1	1	3	1	1	1	0	0	1	4	1	1	1	0	1	0	0	1	0	5	26
12	ÖZDEMİR		K	1	0	1	1	1	1	1	1	0	8	1	1	0	0	2	0	0	1	1	2	1	0	1	2	1	1	1	1	1	1	6	1	0	0	1	1	1	1	1	1	7	27
13	EVİRGEN		E	0	1	0	1	1	0	1	1	1	7	1	1	1	0	3	1	0	1	0	2	1	1	0	2	1	0	0	0	0	1	2	1	0	1	1	1	0	0	1	0	5	21
14	ŞANVER		K	0	1	1	1	1	1	1	1	1	9	1	1	0	0	2	1	0	1	1	2	1	1	0	2	1	1	1	1	0	1	5	1	1	1	1	1	0	0	1	1	7	27
15	YILDIRIM		K	1	1	1	1	1	1	1	1	1	10	1	1	0	1	3	1	0	1	1	3	1	0	0	1	1	1	0	1	1	1	5	1	0	0	1	1	1	0	1	1	6	28
16	BÜLBÜL		E	0	1	1	1	1	0	1	1	0	7	1	1	0	1	3	0	1	1	1	3	1	0	0	1	1	1	1	0	0	1	4	1	0	1	1	1	0	0	1	0	5	23
17	GÜNAŞAN		K	0	1	1	1	1	0	1	1	1	8	1	1	0	1	3	1	0	1	1	3	1	1	1	3	1	1	1	1	1	1	6	1	1	1	0	1	1	1	1	1	8	31
18	BULGEN		E	0	1	1	1	1	1	1	1	1	9	1	1	0	1	3	1	1	1	1	4	1	1	1	3	1	1	1	1	1	1	6	1	1	1	1	1	1	0	1	0	7	32
19	PAŞA		K	1	1	1	1	1	1	1	1	1	10	1	1	0	1	3	0	1	1	0	2	1	1	1	3	1	1	1	1	0	1	5	1	0	0	1	1	1	0	1	0	5	28
20	KAHRAMAN		E	1	1	0	1	1	1	1	1	0	8	1	1	0	1	3	1	0	1	0	2	1	1	1	3	1	0	0	0	1	1	3	0	0	1	1	1	0	0	1	0	4	23
21	CANDAN		E	0	1	1	1	1	1	1	1	1	9	1	0	0	1	2	0	0	1	1	2	1	1	0	2	1	0	1	0	0	0	2	1	1	1	1	1	0	0	1	1	7	24
22	KİRAZ		K	0	0	1	1	1	0	1	1	1	7	0	1	0	1	2	1	0	0	1	1	2	1	1	1	3	1	0	1	0	1	4	1	1	1	1	1	1	0	1	1	8	25
23	OKUTAN		E	0	1	0	1	1	0	0	1	1	6	1	1	1	1	4	1	1	1	0	3	1	1	1	3	1	1	1	1	0	1	5	1	0	1	0	1	0	0	1	0	4	25
24	SATIR		K	1	1	1	1	1	0	1	1	1	9	1	1	0	1	3	0	0	1	1	2	1	0	1	2	1	1	1	1	1	1	6	1	1	0	1	1	1	0	1	1	7	29
25	AYAS		E																																										
26	PAŞA		E	0	1	0	1	1	0	1	1	1	7	1	1	0	1	3	1	1	1	1	4	1	1	1	3	1	1	0	0	1	1	4	0	0	0	0	1	1	0	1	1	4	25
27	KOÇ		K	1	1	1	1	1	0	1	1	1	9	1	1	0	1	3	1	1	0	0	2	1	1	1	3	1	0	1	0	0	1	3	1	0	0	1	1	1	0	1	1	6	26
28	ÖZÇELİK		E	0	1	1	1	1	0	0	0	1	6	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	1	0	1	1	1	0	0	1	1	6	16
29	KÖKER		K	1	1	1	1	1	0	1	1	1	9	1	1	0	1	3	0	0	1	1	2	1	1	0	2	1	1	1	1	1	1	6	1	0	0	1	1	0	1	1	0	5	27
	FREKANS =			14	26	24	28	28	16	22	26	28	22		25	24	2	22		13	12	26	16		24	19	15		28	19	23	16	18	27		24	14	18	24	28	17	9	27	18		
										ORTALAMA =				8.36				ORTALAMA =	2.61				ORTALAMA =	2.39			ORTALAMA =	2.21				ORTALAMA =	4.64						ORTALAMA =	6.39	26.61

1= Doğru
0= Yanlış

Ölçüm yapılmadı
Bilgi düzeyi yetersiz
Bilgi düzeyi iyi

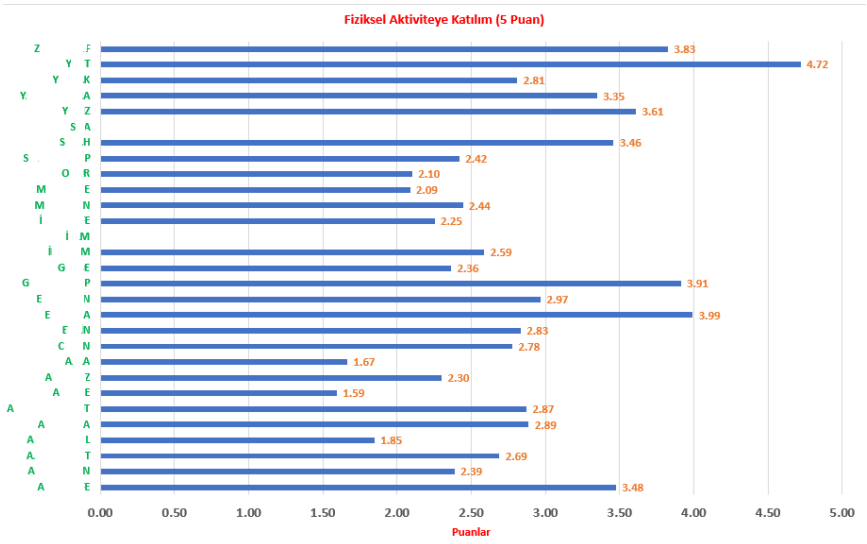
ÇOCUKLAR İÇİN FİZİKSEL AKTİVİTE ANKETİ DEĞERLENDİRME FORMU

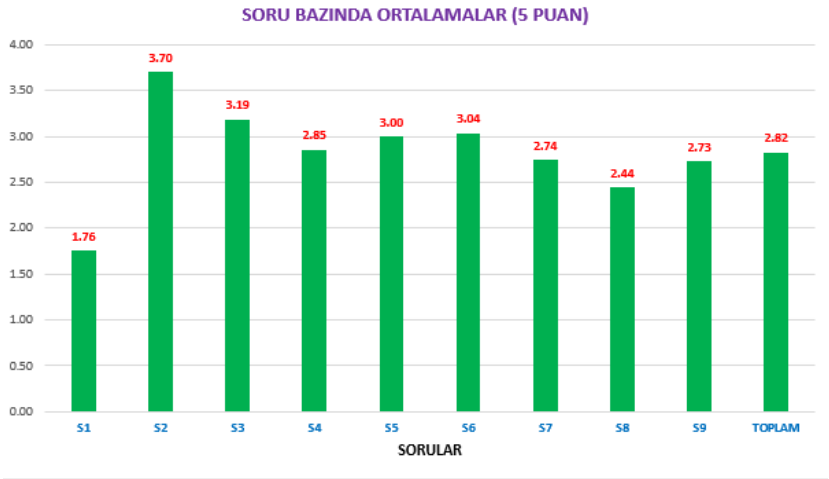
Sıra No	Öğrencinin Adı ve Soyadı		Numarası	Cinsiyet	1. ÖLÇÜM											2. ÖLÇÜM										
					S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	TOPLAM	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	TOPLAM
1		AKBULUT		2		4	2	2	4	3	3	2	4.33	0	3.04	1.71	5	5	5	3	3	3	3	2.57	0	3.48
2		KARADELİOĞLU		2	1.78	5	2	1	2	1	1	2	3	0	2.09	1.92	5	2	1	2	3	2	2	2.57	0	2.39
3		SİLİNDİR		2	1.42	4	1	1	3	4	3	2	1.85	0	2.36	1.21	4	1	2	4	4	2	3	3	0	2.69
4		AKKOÇ		1	1.35	4	2	3	2	3	3	2	1.71	0	2.45	1.21	3	2	3	1	2	2	1	1.42	0	1.85
5		CÜNİ		2	1.85	3	5	5	4	1	4	3	3.14	0	3.33	1.28	3	5	5	3	3	2	2	1.71	0	2.89
6		KILIÇ		2	1.57	4	2	2	5	3	2	3	3	0	2.84	1.71	4	5	5	2	1	1	3	3.14	0	2.87
7		TALAY		1	1.42	4	2	2	3	1	2	3	2.42	0	2.32	1.21	2	1	1	3	2	1	1	2.14	0	1.59
8		SERDAR		1	1.5	2	2	1	2	1	4	1	1.57	0	1.79	1.71	3	2	2	1	3	4	2	2	0	2.30
9		EROL		1	1.07	3	2	2	1	1	1	1	1	0	1.45	1.42	3	2	2	2	1	1	1	1.57	0	1.67
10		GÜNEŞ		1	2	5	3	2	3	3	3	3	2.57	0	2.95	1.57	4	1	1	4	4	4	3	2.42	0	2.78
11		YILDIRIM		1	1.42	4	3	2	1	1	2	2	1.42	0	1.98	1.36	4	2	2	3	4	4	3	2.14	0	2.83
12		ÖZDEMİR		1	2.85	4	5	3	5	3	5	3	4.14	0	3.89	2.79	5	4	4	5	3	4	4	4.14	0	3.99
13		EVİRGEN		2	2.85	5	5	2	5	4	5	4	3.28	0	4.01	2.14	4	5	1	3	3	3	3	2.57	0	2.97
14		ŞANVER		1	1.5	5	2	4	3	3	3	2	2.42	0	2.88	2.21	4	5	4	5	4	4	3	4	0	3.91
15		YILDIRIM		1	1.57	4	4	4	1	1	1	2	1.85	0	2.27	1.57	4	3	2	2	1	3	2	2.71	0	2.36
16		BÜLBÜL		2	3.14	4	2	3	3	2	3	2	2.57	0	2.75	1.87	3	2	3	3	3	2	3	2.42	0	2.59
17		GÜNAŞAN		1	1.85	3	2	2	5	4	1	4	3.14	0	2.89											
18		BULGEN		2	1.71	5	2	3	3	3	2	4	1	1	2.75	1.14	5	2	2	3	3	1	1	2.14	1	2.25
19		PAŞA		1	2.07	3	5	4	3	3	1	2	1.85	0	2.77	1.42	3	4	2	3	2	2	2	2.57	0	2.44
20		KAHRAMAN		2	2.64	5	1	2	3	2	1	2	4.14	0	2.53	1.42	3	2	1		2	3	2	2.28	0	2.09
21		CANDAN		2	1.71	4	4	1	1	1	1		1	0	1.84	1.5	4	1	2	2	3	1	2	2.42	0	2.10
22		KİRAZ		1	3.14	3	2	3	3	1	3	1	2	0	2.35	2.21	3	4	1	3	4	2	1	1.57	1	2.42
23		OKUTAN		2	1.92	5	5	5	3	2	4	4	3	0	3.66	2.14	4	5	5	1	3	4	3	4	0	3.46
24		SATIR		1	1.92	4	2	3	3	3	4	2	2.71	0	2.85											
25		AYAS		2												2.21	3	5	5	3	4	4	3	3.28	0	3.61
26		PAŞA		2	2.5	5	2	4	1	1	1	1	1	0	2.06	1.71	3	5	5	4	3	3	2	3.42	1	3.35
27		KOÇ		1	2.85	3	2	1	5	2	1	2	2.14	0	2.33	1.87	3	4	4	3	4	2	1	2.42	0	2.81
28		ÖZÇELİK		2	2.85	5	5	5	5	5	5	5	5	0	4.76	3.2	5	5	5	5	5	5	5	4.28	0	4.72
29		KÖKER		1	1.42	4	2	2	3	3	3	4	2.85	1	2.81	1.72	4	2	2	5	5	5	5	4.71	0	3.83
		ORTALAMA=			2.00	4.04	2.79	2.64	3.04	2.32	2.57	2.52	2.50			1.76	3.70	3.19	2.85	3.00	3.04	2.74	2.44	2.73		2.82

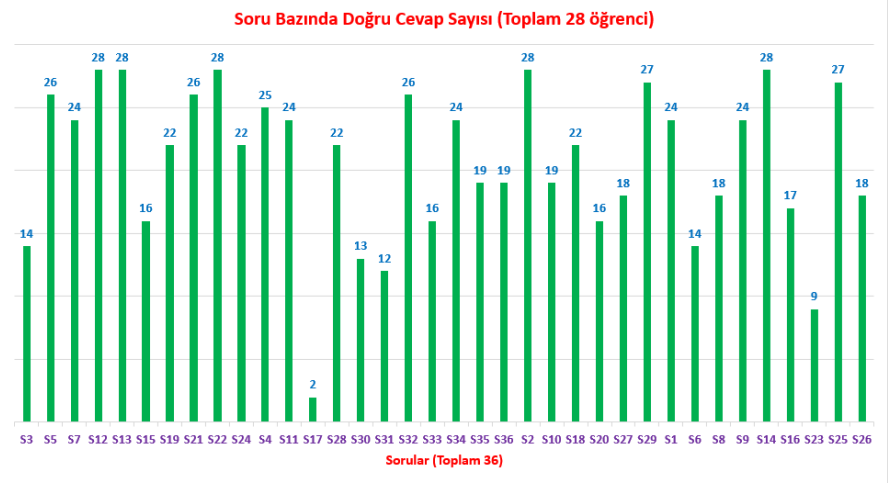
1. Soru= Fiziksel Aktivite Türü
2. Soru= Beden Eğitimi Dersinde
3. Soru= Teneffüslerde
4. Soru= Öğlen Arasında
5. Soru= Okuldan hemen sonra
6. Soru= Akşam
7. Soru= Geçtiğimiz hafta sonu
8. Soru= Fiziksel aktivite sıklığı
9. Soru= Haftanın günlerinde Fiziksel aktivite sıklığı
10. Soru= Hastalık durumu (1 = Evet, 0 = Hayır)

Karşılaştırma yapılamayanlar
Ölçüm yapılmadı

B: EXAMPLES OF DATA VISUALIZATION IN MICROSOFT EXCEL







C: ÇOCUKLAR İÇİN FİZİKSEL UYGUNLUK BİLGİ TESTİ

Sevgili öğrenci,
Bu çalışmanın amacı, sizin sağlıkla ilgili fiziksel aktivite bilgi düzeyinizi gözden geçirmenize yardımcı olmaktır. Testi doldurmanız yaklaşık 25-30 dakikanızı alacaktır. Vereceğiniz bilgiler bu çalışma dışında hiçbir yerde kullanılmayacaktır. Bilgi düzeyinizin doğru ve güvenilir bir şekilde değerlendirilebilmesi için tüm soruların eksiksiz cevaplandırılması gerekmektedir. Göstereceğiniz özenden dolayı şimdiden teşekkür ederiz.
Yönerge: Her bir ifadeyi dikkatlice okuyunuz. Şıklardan en uygun olduğunu düşündüğünüz ifadeyi işaretleyiniz.

1. Kalp bir .....
   a) kemiktir.
   b) kastır.
   c) ciğerdir.

2. Isınma (esnetme, açma-germe) ..... olmana yardımcı olur.
   a) daha esnek
   b) daha az esnek
   c) kaslı

3. Kalp atımı .....
   a) Kalbin büyüklüğüdür.
   b) Kalbinin ne kadar sağlıklı olduğudur.
   c) Kalbinin bir dakikada ne kadar attığıdır.

4. Mekik, barfiks ve şınav çekmek ..... geliştirir.
   a) Kas dayanıklılığını
   b) Kalp-dolaşım sistemi dayanıklılığını
   c) Esnekliğini

5. Aşağıdakilerden hangisi aerobik (kalp-dolaşım sistemi dayanıklılığını destekleyen) bir aktivitedir?
   a) Bowling
   b) İp atlamak
   c) Golf

6. Yürüyüş sırasında ayağının hangi kısmı ilk olarak yerle temas etmelidir?
   a) Ayak ucu
   b) Yan tarafı
   c) Topuk

7. Aerobik çalışmada amaç ..... ulaşmaktır.
   a) En düşük ağırlığa
   b) Parmak uçlarına
   c) Hedeflenen kalp-atım hızına

8. Kendi kendinize yapabileceğiniz en iyi fiziksel uygunluk etkinliği aşağıdakilerden hangisidir?
   a) Evinizin çevresinde bir tur bisiklete binmek
   b) 1.6 km yürüyüş yapmak
   c) Bilgisayar oyunları oynamak

9. Bir egzersiz programını devam ettirebilmek için ihtiyacım olan şey ..... .
    a) Özel bir plana sahip olmamaktır.
    b) Yapmaktan zevk aldığım aktiviteleri seçmektir.
    c) Arkadaşlarımdan kaçmaktır.

10. Aerobik bir aktivitenin sonunda önemli olan .....
    a) Soğuma yapmaktır.
    b) Oturmaktır.
    c) Isınma yapmaktır.

11. Mekik hareketi ..... güçlendirmek için iyidir.
    a) Karın kaslarımı
    b) Bacak kaslarımı
    c) Kol kaslarımı

12. Fiziksel olarak fit (formda) olmak istiyorsanız ..... egzersiz yapmalısınız.
    a) Haftada bir defa
    b) Düzenli olarak
    c) Sadece bir arkadaşınızla

13. Kalp-dolaşım sistemi ..... için önemlidir.
    a) Sadece çocuklar için
    b) Sadece büyükler için
    c) Herkes için

14. Yürüyüş sırasında nefes alışverişi .....
    a) Rahat olmalıdır.
    b) Hızlı olmalıdır.
    c) Durmalıdır.

15. Aerobik ..... demektir.
    a) Oksijensiz
    b) Oksijenli
    c) Güçlendirme

16. Aşağıdakilerden hangisi egzersizin faydalarından biri **<u>değildir?</u>**
    a) Stresi azaltır.
    b) Kan basıncını azaltır.
    c) Kan yağı değerini yükseltir.

17. 100m sürat koşusu ne tür bir etkinliktir?
    a) Aerobik
    b) Anaerobik
    c) Kas dayanıklılığı

18. Gerdirme yaparken ..... .
    a) Yavaş hareketler kullanmalısın.
    b) Sıçramalısın.
    c) Daima ayakta olmalısın.

19. Fiziksel uygunluğun en önemli parçası .....
    a) Kassal kuvvettir.
    b) Kalp-dolaşım sistemi dayanıklılığıdır.
    c) Esnekliktir.

20. Soğuma egzersizleri önemlidir çünkü kalbin .....
    a) Daha hızlı atmasını sağlar.
    b) Daha güçlü olmasını sağlar.
    c) Yavaşça toparlanmasını sağlar.

21. Kalp-dolaşım sistemi dayanıklılığının gelişmesini sağlayan en iyi aktivite .....
    a) Yürüyüştür.
    b) Futboldur.
    c) Ağırlık kaldırmaktır.

22. Aerobik dansın en **öncelikli** amacı .....
    a) İyi bir dansçı olmaktır.
    b) Kalp-dolaşım sistemi dayanıklılığını arttırmaktır.
    c) Dans rutinlerini öğrenmektir.

23. Doğru jogging (hafif tempo koşu) formunda, vücut .....
    a) Kusursuz derecede düz olmalıdır.
    b) Yavaşça öne doğru eğilmelidir.
    c) Geriye, bele doğru yaslanır.

24. Aerobik dayanıklılığı geliştirebilmek için, ... egzersiz yapılmalıdır.
    a) Haftada üç kez veya daha fazla
    b) Haftada iki kez
    c) Haftada bir kez

25. Bireysel fiziksel uygunluk programında .....
    a) İhtiyaçlarına uygun olan egzersizleri kullanmalısın.
    b) Sadece kolay olan egzersizleri yapmalısın.
    c) Daima aynı egzersizleri kullanmalısın.

26. Uzmanların önerilerine göre fiziksel olarak sağlıklı kalabilmek için günde kaç adım atmalıyız?
    a) 1000
    b) 5000
    c) 10000

27. Barış okulun atletizm takımındadır. Her antrenman öncesinde ısınma egzersizleri yapmaktadır. Aşağıdakilerden hangisi Barış'ın her antrenman öncesinde ısınma egzersizleri yapmasının **<u>nedeni/nedenlerindendir</u>?**
    a) Ortaya çıkabilecek sakatlıkları önlemek
    b) Vücudu fiziksel olarak yapılacak egzersize hazırlamak
    c) Hepsi

28. Düzenli ağırlık antrenmanı yapan bir kişide belirli bir süre sonrasında kişinin kas yapısında ..... meydana gelir.
    a) Kasın sayısında artış
    b) Kasın büyüklüğünde artış
    c) Kasın boyunda uzama

29. Fiziksel etkinlik sonrası soğuma için ..... **<u>en uygundur.</u>**
    a) Basketbol oynamak
    b) Yüksek tempoda bisiklet sürmek
    c) Yürüme, yavaş tempoda koşu ve esnetme

30. ve 31. soruları aşağıdaki paragrafa göre cevaplayınız.

Nurdan'ın annesi sırt ağrısı problemi çekmektedir. Doktorları yaptığı testler sonucunda annesinin bel ve sırt esnekliklerinin düşük olduğunu ve bunu geliştirmesi gerektiğini söylemiştir. Nurdan annesi için egzersiz planı hazırlamak istemektedir.

30. Nurdan'a aşağıdaki esneklik hareketlerinden hangilerini mutlaka seçmesini önerirsiniz?

A)  B) 

C)  D) 

a) A ve B
b) B ve C
c) C ve D

31. Nurdan'ın annesi haftada en az ..... gün esneklik çalışması yapmalıdır.
a) 1 gün
b) 3 gün
c) 5 gün

32 . ..... sporcularının kaslarının daha esnek olması beklenir?
a) Cimnastik
b) Futbol
c) Voleybol

33. ..... kas dayanıklılığının geliştirilmesinde **daha etkili** olacaktır.
a) Yavaş tempoda koşu
b) Ağırlık kaldırma: 1-5 tekrarlı ağır yüklerle yapılan etkinlikler
c) Ağırlık kaldırma: 20-30 tekrarlı düşük yüklerle yapılan etkinlikler

34., 35. ve 36. soruları aşağıdaki paragrafa göre cevaplayınız.

Selçuk 13 yaşındadır ve kilo vermesi gerekmektedir. Bunun için fiziksel aktivite düzeyini artırmak istemektedir.

34. Selçuk ..... türde fiziksel etkinlikler seçmelidir.
a) Takım oyunları (futbol, basketbol vb)
b) Hızlı yürüyüş, yavaş koşu, bisiklet sürme, yüzme vb
c) Ağırlık kaldırma

35. Egzersiz yaparken dakikadaki kalp atım hızı hedefi nasıl olmalıdır?
a) 100 atım/ dk dan düşük olmalıdır
b) En az 20 dk egzersiz sürdürebilecek kadar olmalıdır
c) 180 atım/ dk dan daha yüksek olmalıdır

36. Selçuk, ... sıklıkta egzersiz yapmalıdır.
a) Tercihen her gün
b) Haftada 2 gün
c) Haftada 3 gün

D: ÇOCUKLAR İÇİN FİZİKSEL AKTİVİTE ANKETİ

Yönerge

Son 7 gün içindeki (son 1 haftadaki) fiziksel aktivite düzeyinizi öğrenmeye çalışıyoruz. Bu etkinlikler terlemenize ya da bacaklarınızı yorgun hissetmenize neden olacak düzeyde spor yapmak ya da dans etmek ya da sizi nefes nefese bırakan koşma, tırmanma ve kayma gibi oyunlardır.

Unutmayın:
1. Bu ankette doğru ya da yanlış cevap yoktur- Bu bir test değildir.
2. Lütfen bütün soruları, doğru ve dürüstçe yanıtlayınız- bu çok önemlidir.

1) Boş vakitlerinizdeki fiziksel aktivite: Geçtiğimiz 7 gün içinde (son haftada) aşağıdaki aktivitelerden herhangi birini yaptınız mı? Cevabınız evet ise kaç kez? (Her soru için tek bir seçeneği işaretleyiniz).

	Hiç yapmadım	1-2 kez	3-4 kez	5-6 kez	7 kez veya daha fazla
1. Egzersiz amaçlı yürüyüş	□	□	□	□	□
2. Kovalamaca	□	□	□	□	□
3. Bisiklete binme	□	□	□	□	□
4. Koşma	□	□	□	□	□
5. Futbol	□	□	□	□	□
6. Voleybol	□	□	□	□	□
7. Basketbol	□	□	□	□	□
8. Yüzme	□	□	□	□	□
9. Dans	□	□	□	□	□
10. Buz pateni	□	□	□	□	□
11. Kay kay	□	□	□	□	□
12. Zıplama	□	□	□	□	□
13. Kürek çekme	□	□	□	□	□
14. Paten kaymak	□	□	□	□	□
15. Diğer	□	□	□	□	□
16. Diğer	□	□	□	□	□

2) Son 7 günde beden eğitimi (BE) derslerinde ne sıklıkla hareketliydiniz (çok oynamak, koşmak, zıplamak, atlamak gibi.)? (Sadece birini işaretleyin).

1. Hiç hareketli değildim. Beden eğitimi derslerine katılmıyorum.
2. Hemen hemen hiç hareketli değildim.
3. Bazen hareketliydim.
4. Oldukça sık hareketliydim.
5. Her zaman hareketliydim.

3) Son 7 günde, *teneffüslerde* en çok ne yaptınız? (Sadece birini işaretleyin).

1. Oturdum (konuştum, okudum, ödev yaptım).
2. Etrafta gezindim veya dolaştım.
3. Çok az koştum veya oynadım.
4. Biraz koştum veya oynadım.
5. Zamanın çoğunu koşarak, oynayarak geçirdim.

4) Son 7 günde, *öğlen arasında ne yaptınız?* (Öğle yemeği yemek dışında)? (Sadece birini işaretleyin).

1.Oturdum (konuştum, okudum, ödev yaptım).
2. Etrafta gezindim veya dolaştım.
3. Çok az koştum veya oynadım.
4. Biraz koştum veya oynadım.
5. Zamanın çoğunu koşarak oynayarak geçirdim.

5) Son 7 gün içinde, *okuldan hemen sonra*, kaç gün çok aktif olarak spor yaptınız, dans ettiniz ya da oyun oynadınız? (Sadece birini işaretleyin).

1. Hiç
2. Geçen hafta 1 kez
3. Geçen hafta 2 ya da 3 kez
4. Geçen hafta 4 kez
5. Geçen hafta 5 kez

6) Son 7 günde, kaç *akşam* çok aktif olarak spor yaptınız, dans ettiniz ya da oyun oynadınız? (Sadece birini işaretleyin).

1. Hiç
2. Geçen hafta 1 kez
3. Geçen hafta 2 ya da 3 kez
4. Geçen hafta 4 ya da 5 kez
5. Geçen hafta 6 ya da 7 kez

7) *Geçtiğimiz hafta sonu*, kaç kez çok aktif olarak spor yaptınız, dans ettiniz ya da oyun oynadınız? (Sadece birini işaretleyin).

1. Hiç
2. 1 kez
3. 2 -3 kez
4. 4 -5 kez
5. 6 ya da daha fazla kez

8) Aşağıdakilerden *hangisi* son 7 gün içinde boş zamanlarda yaptığınız fiziksel aktivite sıklığını en iyi şekilde tanımlamaktadır? Sizi tanımlayan cevaba karar vermeden önce lütfen beş (5) durumu da okuyunuz.

1. Boş zamanımın hepsini ya da çoğunu **çok az** fiziksel güç isteyen aktiviteler yaparak geçirdim.
2. Boş zamanlarımda **bazen** (geçen hafta **1-2 kez**) fiziksel aktiviteler (örneğin; koşu, yüzme, bisiklete binme, top oynamagibi) yaptım.
3. Boş zamanlarımda **sıklıkla** (geçen hafta **3-4 kez**) fiziksel aktiviteler yaptım.
4. Boş zamanlarımda **sık sık** (geçen hafta **5-6 kez**) fiziksel aktiviteler yaptım.
5. Boş zamanlarımda **çok sık** olarak (geçen hafta **7 ya da daha fazla kez**) fiziksel aktiviteler yaptım.

9) Geçen haftanın her günü için ne sıklıkla fiziksel aktivitede (spor yapmak, dans etmek ya da diğer fiziksel aktiviteler) bulunduğunuzu işaretleyiniz.

	Hiç	Biraz	Orta	Sık	Çok sık
1. Pazartesi	□	□	□	□	□
2. Salı	□	□	□	□	□
3. Çarşamba	□	□	□	□	□
4. Perşembe	□	□	□	□	□
5. Cuma	□	□	□	□	□
6. Cumartesi	□	□	□	□	□
7. Pazar	□	□	□	□	□

10) Geçtiğimiz hafta hasta oldunuz mu veya normal fiziksel aktivitenize engel olacak herhangi bir şey oldu mu? (Birini işaretleyiniz)

1. Evet
2. Hayır

Cevabınız evet ise, engel neydi?_____

E: INTERVIEW QUESTIONS BEFORE THE INTERVENTION

Öncelikle bu görüşmeyi kabul ettiğiniz için teşekkür ederim. Görüşmenin amacı, eğitimde veri kullanımına yönelik uygulamalarınız ve ihtiyaçlarınız ile ilgili görüşlerinizi almaktır. Görüşmeye istediğiniz an ara verebilir ya da bitirebilirsiniz. Verdiğiniz bilgiler tamamen gizli tutulacaktır. Şimdi izninizle ses kayıt cihazını açarak sorularıma başlamak istiyorum.

1. Öğrencilerinizle ilgili hangi verilere sahipsiniz? Hangi verilere erişiminiz var? Bu verilere nereden ulaşıyorsunuz?
   Sonda: SİFU; Sağlık durumları; Derse katılım; Veri yönetim sistemi; Verilerin güncelliği; Güvenilirliği/geçerliliği
2. Öğrencilerle ilgili verilerle ne yapıyorsunuz? Verileri nasıl kullanıyorsunuz?
   Sonda: Öğrencilerin öğrenme ihtiyaçlarını belirleme; Veriye göre dersleri tasarlama; Öğrenci gelişimini gözlemleme; Okul gelişimi; Paydaşlarla paylaşım
3. Topladığınız verileri kullanma konusunda kendinizi nasıl değerlendiriyorsunuz?
   Sonda: Verileri analiz etme; Raporlama, yorumlama ve sunma (grafik vb.); Standartlara uygunluğu
4. Okulunuzda veri kullanımı ile ilgili ne tür düzenlemeler, uygulamalar yapılmaktadır? Neden?
   Sonda: İdareci veri kullanımı teşviği; Veri kullanımına ilişkin paydaşlarla ortak görüş oluşturma; Uzman desteği; Veri kullanımı için yeterli zaman; İç/dış denetleme hesapverilebilirlik
5. Veriler okulunuzda okul gelişimi için nasıl kullanılıyor?
   Sonda: Okul öğrenci başarısı belirleme; Okul yıllık hedefleri belirleme; Öğretmenlerin mesleki gelişim ihtiyaçlarını belirleme
6. Veri kullanımı ile ilgili paydaşlarla paylaşımda bulunuyor musunuz? Evetse, Nasıl?
   Sonda: İdareciniz; Diğer öğretmenler/meslektaşlarınız; Veliler; Öğrenciler

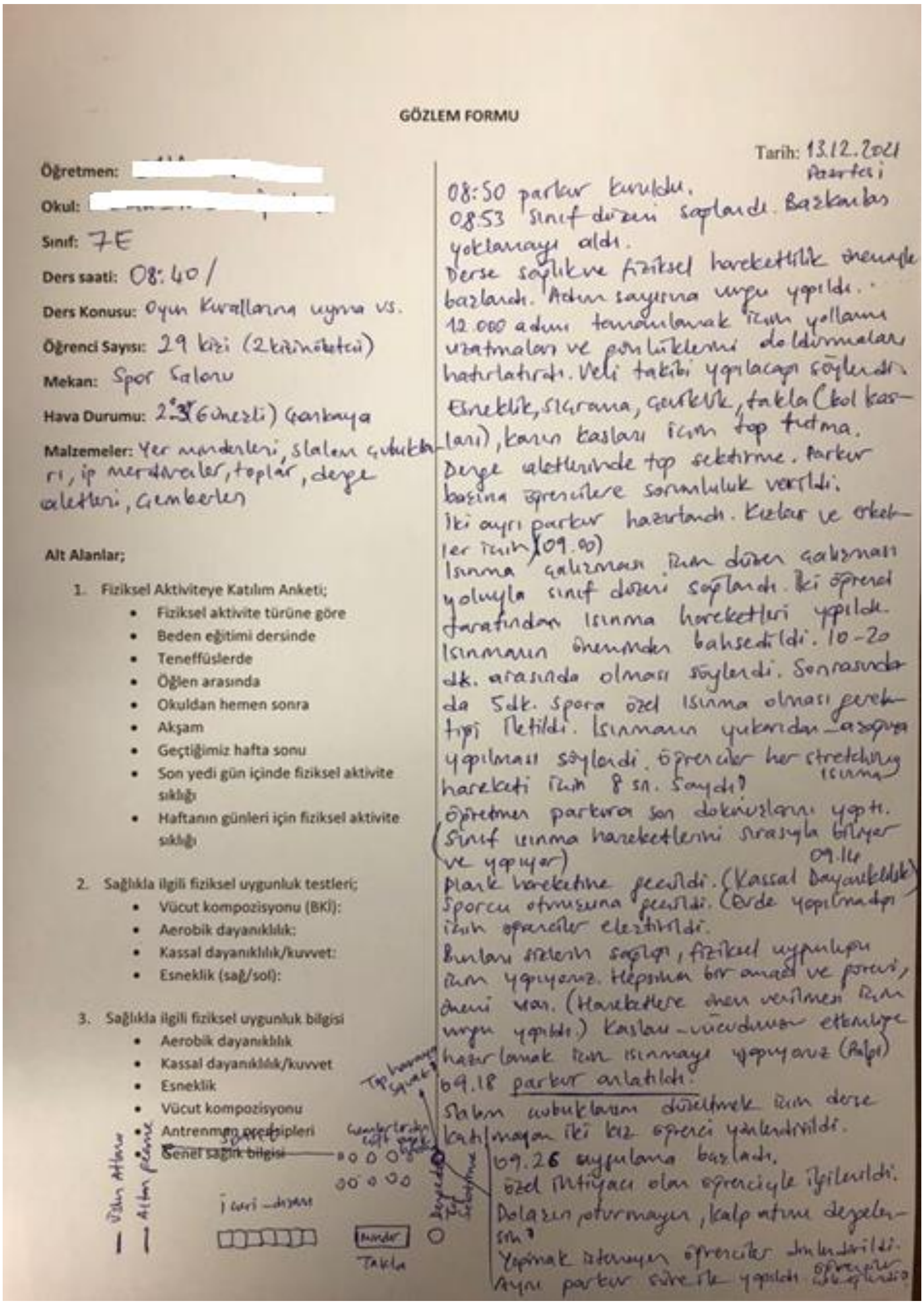
F: INTERVIEW QUESTIONS AFTER THE INTERVENTION

Öncelikle bu görüşmeyi kabul ettiğiniz için teşekkür ederim. Görüşmenin amacı, veriye dayalı karar verme mesleki gelişim programına katılımınız sonrası veri kullanımı ile ilgili görüşleriniz, bilgileriniz, öğretim uygulamalarınız hakkında fikirlerinizi almaktır. Görüşmeye istediğiniz an ara verebilir ya da bitirebilirsiniz. Verdiğiniz bilgiler tamamen gizli tutulacaktır. Şimdi izninizle ses kayıt cihazını açarak sorularıma başlamak istiyorum.

Sizinle altı haftalık veriye dayalı karar verme konusunda bir mesleki gelişim programını tamamladık.

1. Mesleki gelişim programı ile ilgili ne düşünüyorsunuz?
   Sonda: Tasarım (İçerik/Planlama) – Uygulama (İçeriğin sunumu/paylaşımı; Sunulan kaynaklar; Sosyal ortam; Fiziksel ortam/imkanlar)
2. Programa katıldıktan sonra alan bilginizde bir değişiklik oldu mu? Evetse bahseder misiniz? Hayırsa, sizce neden?
   Sonda: Öğretim programı bilgisi, pedagojik alan bilgisi, ölçme-değerlendirme
   Sonda: Öğrenci verisi kullanımı (teknoloji kullanımı: Excel)
   - veri toplama ve organize etme
   - veriyi analiz etme ve özetleme (raporlama/grafikleştirme)
   - veriyi yorumlama ve karar verme
3. Bu programa katılmak öğretiminizi nasıl etkiledi? Neleri sahaya yansıtabildiniz? Açıklar mısınız?
4. Öğrendiğiniz bilgileri derslerinize nasıl aktardınız? Öncelikli olarak hangi bilgileri paylaştınız ve nasıl? Biraz bahseder misiniz?
   Sonda: SİFU, SİFU Bilgisi ve Fiziksel aktiviteye katılım ile ilgili öğretim uygulamaları (ders tasarımı, ders içeriği hazırlama, ders materyali seçme, ölçme-değerlendirme)
5. Öğrencilerinizin sağlıkla ilgili fiziksel uygunlukları ve fiziksel aktiviteye katılımları (derste, teneffüste, öğlen arasında vb.) ile ilgili gözlemlerinizden bahseder misiniz? Veriye dayalı ders işlemeniz sahada uygulamalarınıza nasıl yansıdı?
6. Veri kullanımı ile ilgili paydaşlarla paylaşımda bulundunuz mu? Evetse, nasıl?
   Sonda: İdareciniz; Diğer öğretmenler/meslektaşlarınız; Öğrenciler; Veliler
7. Veriye dayalı karar verme mesleki gelişim programı tekrar hazırlanacak olsa sizin ihtiyaçlarınızı karşılaması için nelerin eklenmesini veya değiştirilmesini önerirsiniz?
   Sonda: Tasarım-Uygulama ve Değerlendirme
8. Sizin eklemek istediğiniz bir şey var mı?

G: OBSERVATION FORM



GÖZLEM FORMU

Tarih: 13.12.2021 Pazartesi

Öğretmen: [redacted]

Okul: [redacted]

Sınıf: 7E

Ders saati: 08:40 /

Ders Konusu: Oyun Kurallarına uyma vs.

Öğrenci Sayısı: 29 kişi (2 kişi nöbetçi)

Mekan: Spor Salonu

Hava Durumu: 2-3° (Güneşli) Çankaya

Malzemeler: Yer minderleri, slalom çubukları, ip merdivenler, toplar, denge aletleri, çemberler

Alt Alanlar;

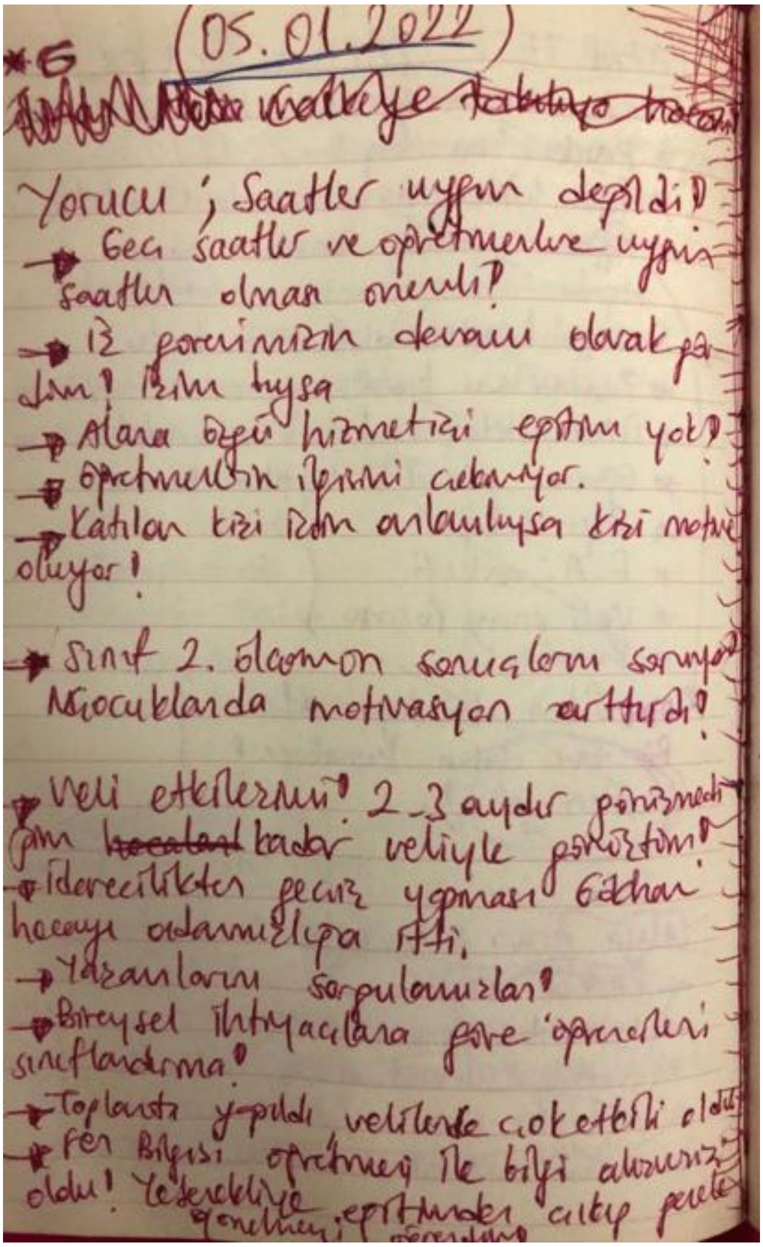
1. Fiziksel Aktiviteye Katılım Anketi;
   - Fiziksel aktivite türüne göre
   - Beden eğitimi dersinde
   - Teneffüslerde
   - Öğlen arasında
   - Okuldan hemen sonra
   - Akşam
   - Geçtiğimiz hafta sonu
   - Son yedi gün içinde fiziksel aktivite sıklığı
   - Haftanın günleri için fiziksel aktivite sıklığı
2. Sağlıkla ilgili fiziksel uygunluk testleri;
   - Vücut kompozisyonu (BKİ):
   - Aerobik dayanıklılık:
   - Kassal dayanıklılık/kuvvet:
   - Esneklik (sağ/sol):
3. Sağlıkla ilgili fiziksel uygunluk bilgisi
   - Aerobik dayanıklılık
   - Kassal dayanıklılık/kuvvet
   - Esneklik
   - Vücut kompozisyonu
   - Antrenman prensipleri
   - ~~Genel sağlık bilgisi~~

İçeri – dışarı

Takla

08:50 parkur kuruldu.
08:53 Sınıf düzeni sağlandı. Başkanlar yoklamayı aldı.
Derse sağlık ve fiziksel hareketlilik önemiyle başlandı. Adım sayısına vurgu yapıldı. 12.000 adımı tamamlamak için yolları uzatmaları ve günlüklerini doldurmaları hatırlatıldı. Veli takibi yapılacağı söylendi.
Esneklik, sıçrama, çeviklik, takla (kol kasları), karın kasları için top tutma. Denge aletlerinde top sektirme. Parkur başına öğrencilere sorumluluk verildi.
İki ayrı parkur hazırlandı. Kızlar ve erkekler için (09.00)
Isınma çalışması için düzen çalışması yoluyla sınıf düzeni sağlandı. İki öğrenci tarafından ısınma hareketleri yapıldı. Isınmanın öneminden bahsedildi. 10-20 dk. arasında olması söylendi. Sonrasında da 5 dk. spora özel ısınma olması gerektiği iletildi. Isınmanın yukarıdan aşağıya yapılması söylendi. Öğrenciler her stretching ısınma hareketi için 8 sn. saydı?
Öğretmen parkura son dokunuşlarını yaptı. (Sınıf ısınma hareketlerini sırasıyla biliyor ve yapıyor) 09.14
Plank hareketine geçildi. (Kassal Dayanıklılık) Sporcu oturuşuna geçildi. (Yerde yapılmadığı için öğrenciler eleştirildi.
Bunları sizlerin sağlığı, fiziksel uygunluğu için yapıyoruz. Hepsinin bir amacı ve süresi, önemi var. (Hareketlere önem verilmesi için vurgu yapıldı.) Kasları-vücudumuzu etkinliğe hazırlamak için ısınmayı yapıyoruz (Rafet)
09.18 parkur anlatıldı.
Slalom çubuklarını düzeltmek için derse katılmayan iki kız öğrenci yönlendirildi.
09.26 uygulama başladı.
Özel ihtiyacı olan öğrenciyle ilgilenildi.
Dolaşın, oturmayın, kalp atımı değelensin?
Yapmak istemeyen öğrenciler yönlendirildi.
Aynı parkur sürekli yapıldı. Öğrenciler ...

H: FIELD NOTE



*6 (05.01.2022)

Yorucu; Saatler uygun değildi!

→ Geç saatler ve öğretmenlere uygun saatler olması önemli!

→ İş görevimizin devamı olarak gördüm! Bizim işiyse

→ Alana özgü hizmetiçi eğitim yok!

→ Öğretmenlerin ilgisini çekiyor.

→ Katılan kişi bizim anlamlıysa kişi motive oluyor!

→ Sınıf 2. oturumun sonuçlarını soruyor! Çocuklarda motivasyon arttırdı!

→ Veli etkilenir mi! 2-3 aydır görüşmediğim ~~hocaları~~ kadar veliyle görüştüm!

→ İdarecilikten geçiş yapması Gökhan hocaya odamızda [illegible] etti.

→ Yazarlarım sorgulanmazlar!

→ Bireysel ihtiyaçlara göre öğrencileri sınıflandırma!

→ Toplantı yapıldı velilerde çok etkili oldu

→ Fen Bilgisi öğretmeni ile bilgi alışverişi oldu! Yetersizliği gördüm; eğitimden çıkıp gerek

I: METU HUMAN SUBJECTS ETHICS COMMITTEE APPROVAL

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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Sayı: 28620816 / 400

29 EYLÜL 2021

Konu : Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi : İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Prof.Dr. Mustafa Levent İNCE

Danışmanlığını yürüttüğünüz Serap SARIKAYA'nın "Ortaokul Beden Eğitimi Öğretmenlerinin Veriye Dayalı Karar Verme Yeterliliklerinin Geliştirilmesi ve Öğrenci Öğrenmesine Etkisi" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve **400-ODTU-2021** protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

Dr.Öğretim Üyesi Şerife SEVİNÇ
İAEK Başkan Vekili

J: OFFICIAL PERMISSIONS TAKEN FROM THE MINISTRY OF NATIONAL EDUCATION

T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü

Sayı : E-14588481-605.99-37716168 26.11.2021
Konu : Araştırma izni

ORTA DOĞU TEKNİK ÜNİVERSİTESİ REKTÖRLÜĞÜNE

İlgi: a) 10.11.2021 tarihli ve 251 sayılı yazınız.
b) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 2020/2 nolu Genelgesi.

Üniversiteniz Sosyal Bilimler Enstitüsü Doktora Öğrencisi Serap SARIKAYA'nın **"Ortaokul Beden Eğitimi Öğretmenlerinin Veriye Dayalı Karar Verme Yeterliliklerinin Geliştirilmesi ve Öğrenci Öğrenmesine Etkisi"** konulu araştırması kapsamında merkez ilçelere bağlı okullarda uygulanacak olan veri toplama araçları ilgi (b) Genelge çerçevesinde incelenmiştir.

Yapılan inceleme sonucunda, söz konusu araştırmanın Müdürlüğümüzde muhafaza edilen ölçme araçlarının; Türkiye Cumhuriyeti Anayasası, Milli Eğitim Temel Kanunu ile Türk Milli Eğitiminin genel amaçlarına uygun olarak, ilgili yasal düzenlemelerde belirtilen ilke, esas ve amaçlara aykırılık teşkil etmeyecek, eğitim-öğretim faaliyetlerini aksatmayacak şekilde okul ve kurum yöneticilerinin sorumluluğunda gönüllülük esasına göre uygulanması Müdürlüğümüzce uygun görülmüştür.

Bilgilerinizi ve gereğini rica ederim.

Harun FATSA
Vali a.
Milli Eğitim Müdürü

Ek:
Uygulama araçları (13 sayfa)
Dağıtım:
Gereği:
ODTÜ
Bilgi:
9 Merkez İlçe MEM

K: INFORMED CONSENT FORM FOR TEACHERS

Gönüllü Katılım Formu

Bu araştırma, Orta Doğu Teknik Üniversitesi, Eğitim Fakültesi Beden Eğitimi ve Spor Bölümü araştırma görevlisi Serap Sarıkaya tarafından yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır. Doktora bitirme projesi kapsamında bu çalışmanın amacı; (1) ortaokul beden eğitimi öğretmenleri için veriye dayalı karar verme ile ilgili bir mesleki gelişim programı/eğitimi tasarlamak ve (2) bu programın/eğitimin beden eğitimi öğretmenlerinin veri kullanımı ile ilgili görüşleri, bilgileri, öğretim uygulamaları ve öğrencilerinin öğrenmesi (sağlıkla ilgili fiziksel uygunlukları, bilgileri ve fiziksel aktiviteye katılımları) üzerine etkisini incelemektir. Katılımcılardan, 6 hafta süresince haftada bir gün 1-2 saat olmak üzere 6 kişiden oluşan bir mesleki öğrenme topluluğuna katılması beklenmektedir. Öğretmenlerle yarı yapılandırılmış görüşmeler, mesleki öğrenme topluluğu toplantıları video-ses kayıtları, saha notları; öğrencilerle ise öğretmenleri tarafından uygulanacak Milli Eğitim Bakanlığının Beden Eğitimi ve Spor Öğretim Programında yer alan sağlıkla ilgili fiziksel uygunluk testleri, önerilen bilgi testi ve fiziksel aktivite anketi yoluyla veri toplanacaktır. Araştırmanın sonunda tasarlanan mesleki gelişim programına katılan beden eğitimi öğretmenlerinin veriye dayalı karar verme ile ilgili mesleki öğrenmelerinin gelişmesi ve bu gelişimin öğrencilerinin öğrenmesine katkı sağlaması beklenmektedir.

Çalışmaya katılım tamamen gönüllülük esasına dayanmaktadır. Arzu edildiği takdirde, herhangi bir yaptırıma maruz kalmadan katılımdan vazgeçme hakkına sahipsiniz. Sizlerden kimlik belirleyici hiçbir bilgi istenmemektedir. Elde edilen veriler tamamen gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilip bilimsel yayınlarda kullanılacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Araştırmaya yönelik daha fazla bilgi için başvurulacak kişinin adresi, telefon numarası ve e-posta adresi aşağıdadır.

Araştırmacı: Serap Sarıkaya
Çankaya İlçesi Üniversiteler Mah. Dumlupınar Bulvarı No: 1 Ankara
Tel: (0312) 210 40 19
E-posta: serapusta5306@gmail.com

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum. Sağladığım bilgilerin bilimsel amaçlı yayınlarda kullanılmasını kabul ediyorum.

İsim Soyad Tarih İmza

-----/-----/--------

L: INFORMED CONSENT FORM FOR STUDENTS

Öğrenci Gönüllü Katılım Formu

Bu araştırma, Orta Doğu Teknik Üniversitesi, Eğitim Fakültesi Beden Eğitimi ve Spor Bölümü araştırma görevlisi Serap Sarıkaya tarafından yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır. Doktora bitirme projesi kapsamında bu çalışmanın amacı; (1) ortaokul beden eğitimi öğretmenleri için veriye dayalı karar verme ile ilgili bir mesleki gelişim programı/eğitimi tasarlamak ve (2) bu programın/eğitimin beden eğitimi öğretmenlerinin veri kullanımı ile ilgili görüşleri, bilgileri, öğretim uygulamaları ve öğrencilerinin öğrenmesi (sağlıkla ilgili fiziksel uygunlukları, bilgileri ve fiziksel aktiviteye katılımları) üzerine etkisini incelemektir.

Çalışma kapsamında, öğretmenleriniz bir mesleki gelişim programına katılacaktır. Mesleki gelişim programına katılan öğretmenlerin öğrencilerinde olan etkiyi değerlendirmesi söz konusudur. Öğrenci öğrenmesi Milli Eğitim Bakanlığının Beden Eğitimi ve Spor Öğretim Programında yer alan sağlıkla ilgili fiziksel uygunluk testleri, önerilen bilgi testi ve fiziksel aktivite anketi ile gözden geçirilecek ve öğretmenlere bu konuda geri bildirim sunulacaktır. Bu da sizin bilgi-beceri edinim düzeyiniz ve fiziksel aktiviteye katılım düzeyinizin değerlendirilmesinde katkı sağlayacaktır.

Çalışmaya katılım tamamen gönüllülük esasına dayanmaktadır. Arzu edildiği takdirde, herhangi bir yaptırıma maruz kalmadan katılımdan vazgeçme hakkına sahipsiniz. Sizlerden kimlik belirleyici hiçbir bilgi istenmemektedir. Elde edilen veriler tamamen gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilip bilimsel yayınlarda kullanılacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Araştırmaya yönelik daha fazla bilgi için başvurulacak kişinin adresi, telefon numarası ve e-posta adresi aşağıdadır.

Araştırmacı: Serap Sarıkaya
Çankaya İlçesi Üniversiteler Mah. Dumlupınar Bulvarı No: 1 Ankara
Tel: (0312) 210 40 19
E-posta: serapusta5306@gmail.com

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum. Sağladığım bilgilerin bilimsel amaçlı yayınlarda kullanılmasını kabul ediyorum.

İsim Soyad Tarih İmza

-----/-----/--------

M: PARENT CONSENT FORM

Veli Onay Formu

Sayın Veli

Bu araştırma, Orta Doğu Teknik Üniversitesi, Eğitim Fakültesi Beden Eğitimi ve Spor Bölümü araştırma görevlisi Serap Sarıkaya tarafından yürütülmektedir. Bu mektubun gönderilmesi sizleri çalışma hakkında bilgilendirmek ve tarafınızdan izin verilmesi amacını içermektedir. Doktora bitirme projesi kapsamında bu çalışmanın amacı; (1) ortaokul beden eğitimi öğretmenleri için veriye dayalı karar verme ile ilgili bir mesleki gelişim programı/eğitimi tasarlamak ve (2) bu programın/eğitimin beden eğitimi öğretmenlerinin veri kullanımı ile ilgili görüşleri, bilgileri, öğretim uygulamaları ve öğrencilerinin öğrenmesi (sağlıkla ilgili fiziksel uygunlukları, bilgileri ve fiziksel aktiviteye katılımları) üzerine etkisini incelemektir.

Çalışma kapsamında, öğretmenleriniz bir mesleki gelişim programına katılacaktır. Mesleki gelişim programına katılan öğretmenlerin öğrencilerinde olan etkiyi değerlendirmesi söz konusudur. Öğrenci öğrenmesi Milli Eğitim Bakanlığının Beden Eğitimi ve Spor Öğretim Programında yer alan sağlıkla ilgili fiziksel uygunluk testleri, önerilen bilgi testi ve fiziksel aktivite anketi ile gözden geçirilecek ve öğretmenlere bu konuda geri bildirim sunulacaktır. Bu da çocuğunuzun bilgi-beceri edinim düzeyi ve fiziksel aktiviteye katılım düzeyinin değerlendirilmesinde katkı sağlayacaktır.

Katılım sonunda herhangi bir maddi kazanç sağlanmayacaktır. Velisi bulunduğunuz öğrencilerden kimlik belirleyici hiçbir bilgi istenmemektedir. Elde edilen veriler tamamen gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilip bilimsel yayınlarda kullanılacaktır.

Yapılacak olan çalışmaya öğrencilerin katılımı tamamen gönüllülük esasına dayanmaktadır. Arzu edildiği takdirde, herhangi bir yaptırıma maruz kalmadan katılımdan vazgeçme hakkına sahiptirler. Sizin onayınızın yanı sıra çocuğunuzun kendi gönüllülüğü de bir ön koşuldur.

Çalışmaya ya da çocuğunuzun katılımına yönelik daha fazla bilgi için başvurulacak kişinin adresi, telefon numarası ve e-posta adresi aşağıdadır.

Saygılarımla

Teşekkürler.

Araştırmacı: Serap Sarıkaya
Adres: Çankaya İlçesi Üniversiteler Mah. Dumlupınar Bulvarı No: 1 Ankara
Tel: (0312) 210 40 19
E-posta: serapusta5306@gmail.com

Yukarıdaki bilgileri okudum ve çocuğumun bu çalışmada yer almasını onaylıyorum (Lütfen alttaki iki seçenekten birini işaretleyiniz).

Evet onaylıyorum___ ***Hayır, onaylamıyorum***___

Ebeveynin adı-soyadı: _____ Bugünün Tarihi: _____

Çocuğun adı soyadı ve doğum tarihi:_____

İmzalanan bu formu lütfen öğrencimiz aracılığı ile beden eğitimi ve spor öğretmeninize ulaştırın.

Çocuğunuzun katılımı ya da haklarının korunmasına yönelik sorularınız varsa ya da çocuğunuz herhangi bir şekilde risk altında olabileceğine, strese maruz kalacağına inanıyorsanız Orta Doğu Teknik Üniversitesi Etik Kuruluna (312) 210-37 29 telefon numarasından ulaşabilirsiniz.

N: FIGURES

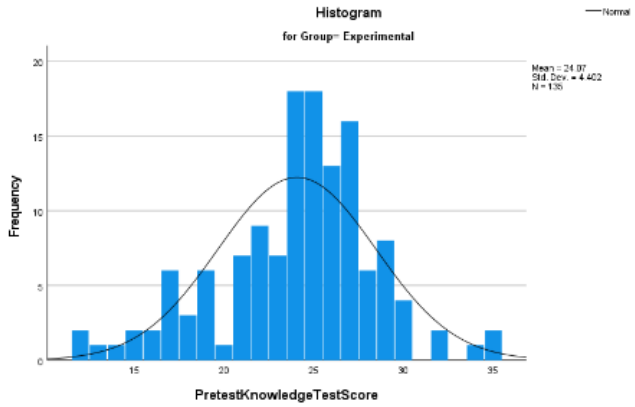


Figure 8. 1. Distribution graph of pre-test HrF knowledge for experimental group

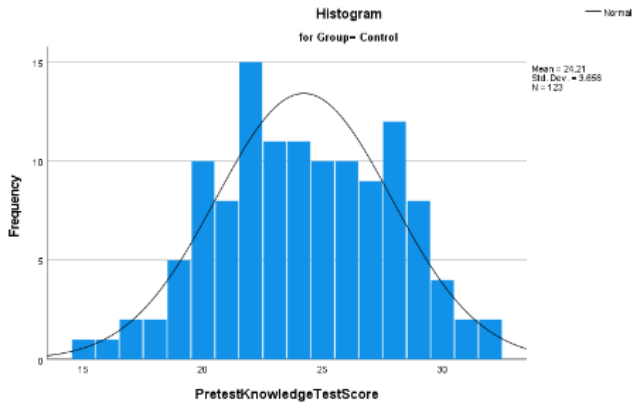


Figure 8. 2. Distribution graph of pre-test HrF knowledge for control group

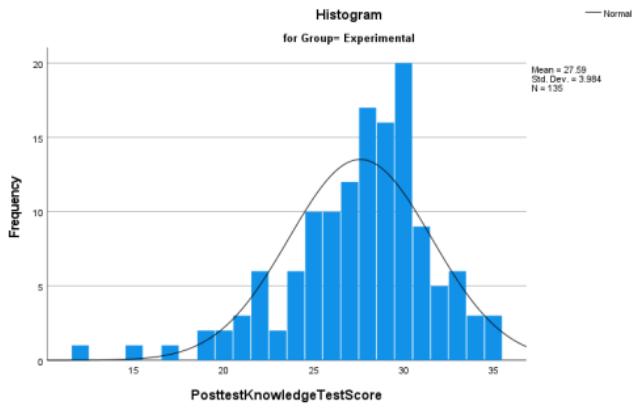


Figure 8. 3. Distribution graph of post-test HrF knowledge for experimental group

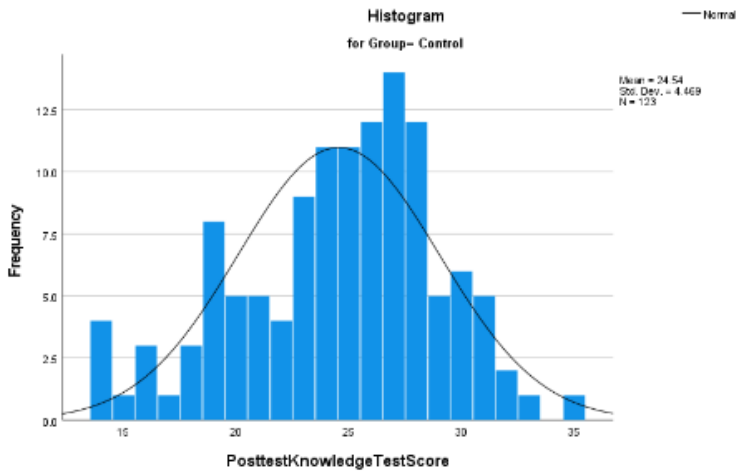


Figure 8. 4. Distribution graph of post-test HrF knowledge for control group

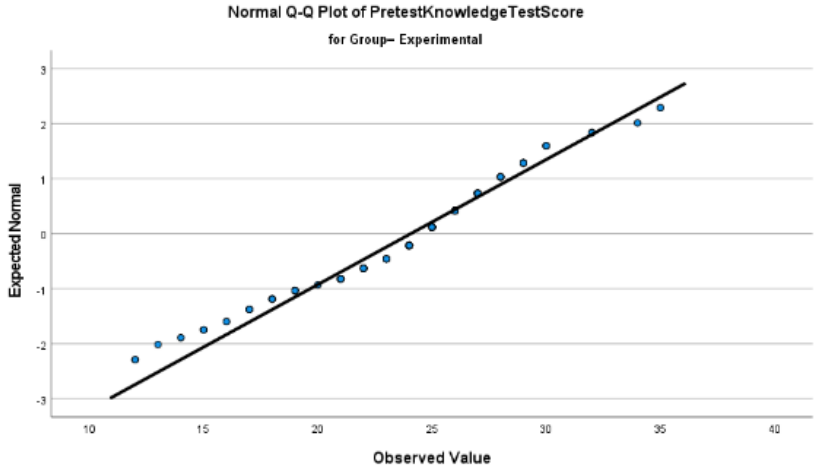


Figure 8. 5. Q-Q plot of pre-test HrF knowledge for experimental group

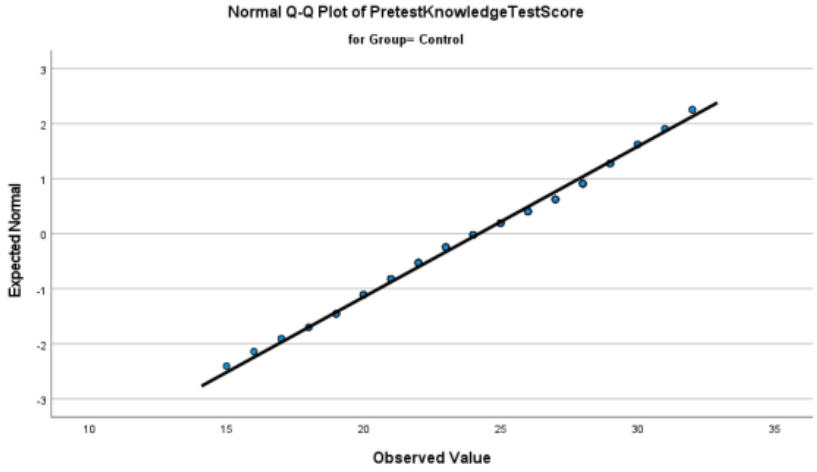


Figure 8. 6. Q-Q plot of pre-test HrF knowledge for control group

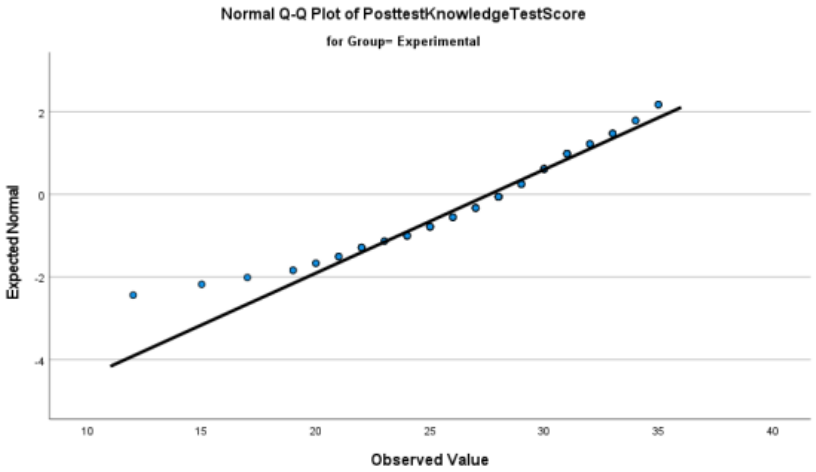


Figure 8. 7. Q-Q plot of post-test HrF knowledge for experimental group

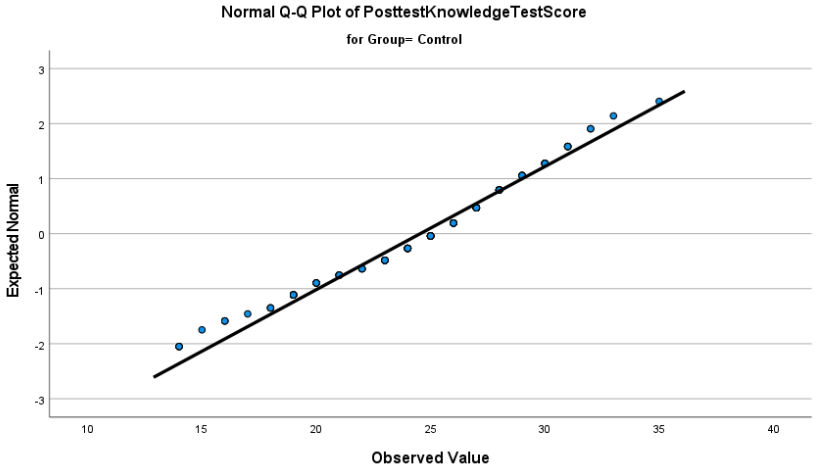


Figure 8. 8. Q-Q plot of post-test HrF knowledge for control group

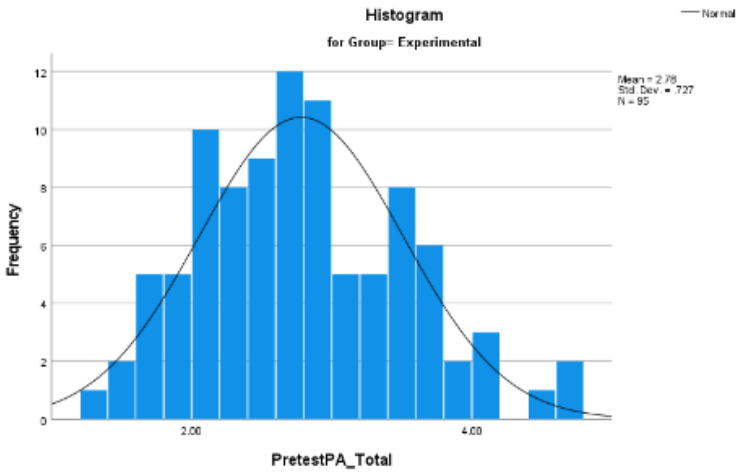


Figure 8. 9. Distribution graph of pre-test physical activity for experimental group

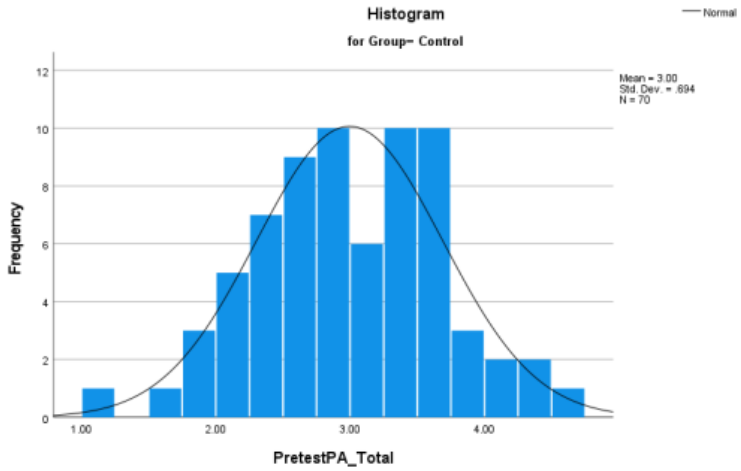


Figure 8. 10. Distribution graph of pre-test physical activity for control group

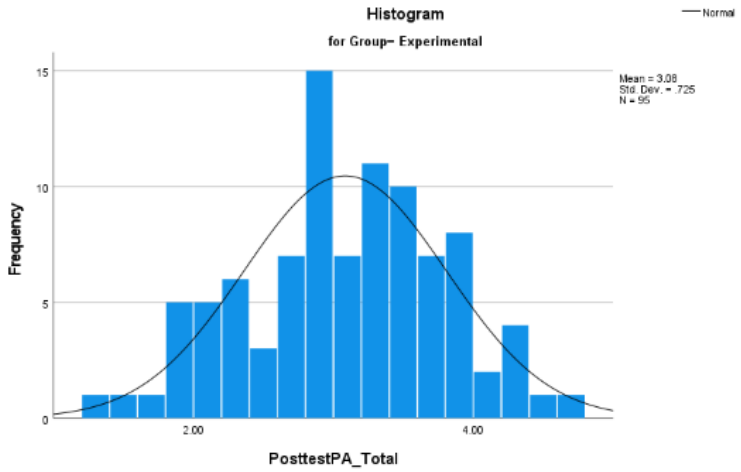


Figure 8. 11. Distribution graph of post-test physical activity for experimental group

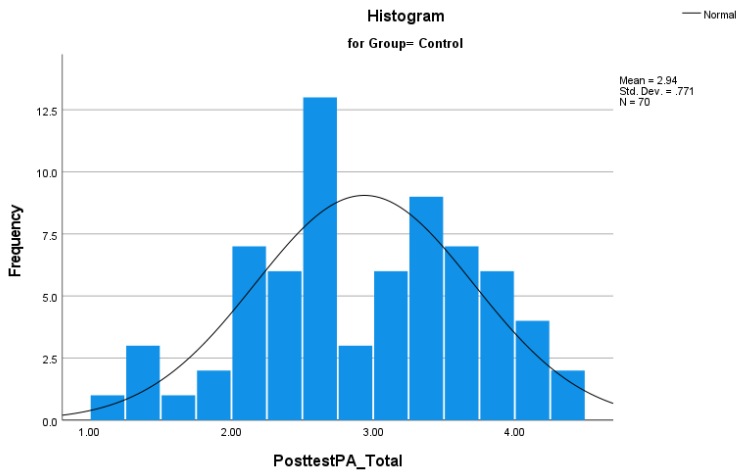


Figure 8. 12. Distribution graph of post-test physical activity for control group

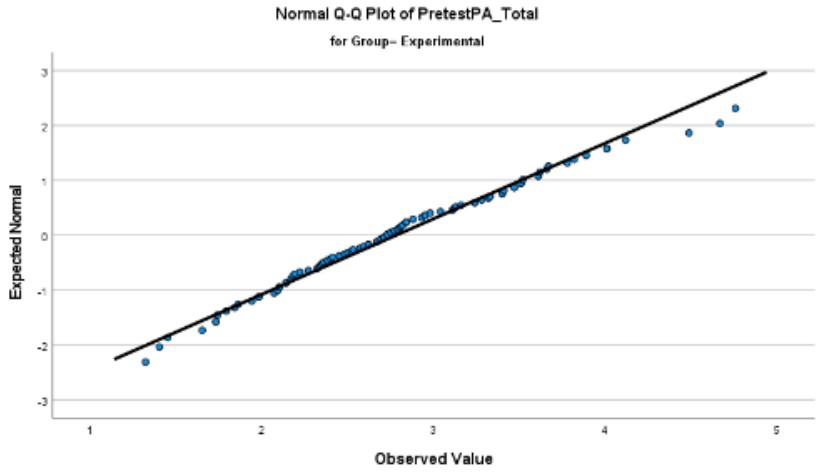


Figure 8. 13. Q-Q plot of pre-test physical activity for experimental group

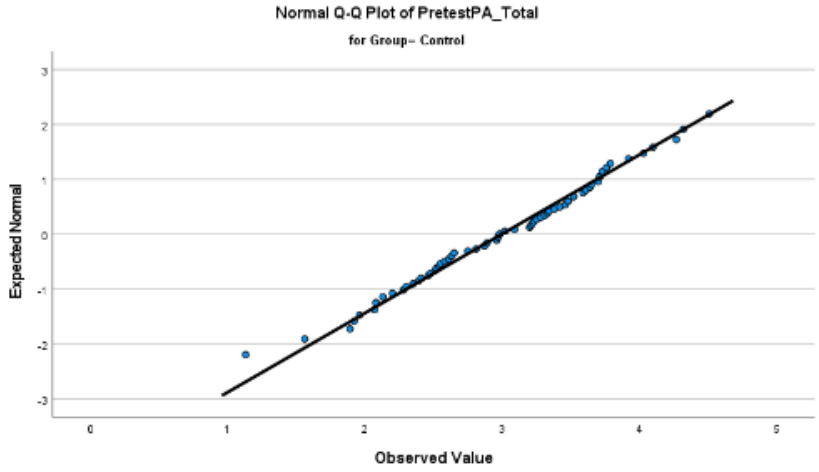


Figure 8. 14. Q-Q plot of pre-test physical activity for control group

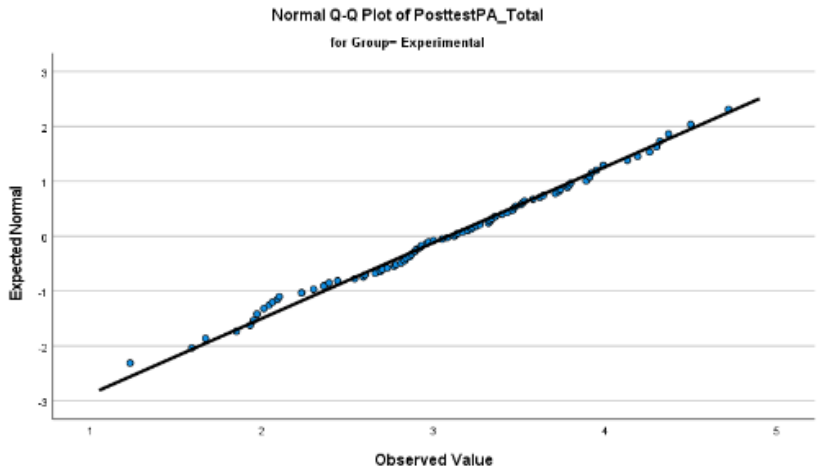


Figure 8. 15. Q-Q plot of post-test physical activity for experimental group

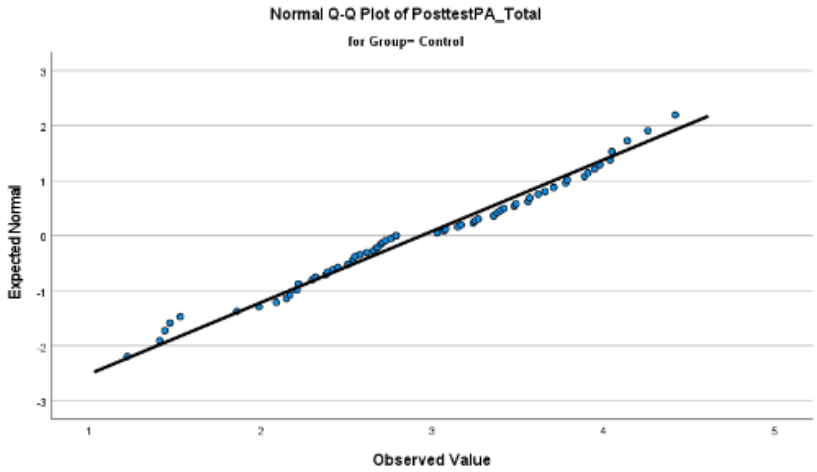
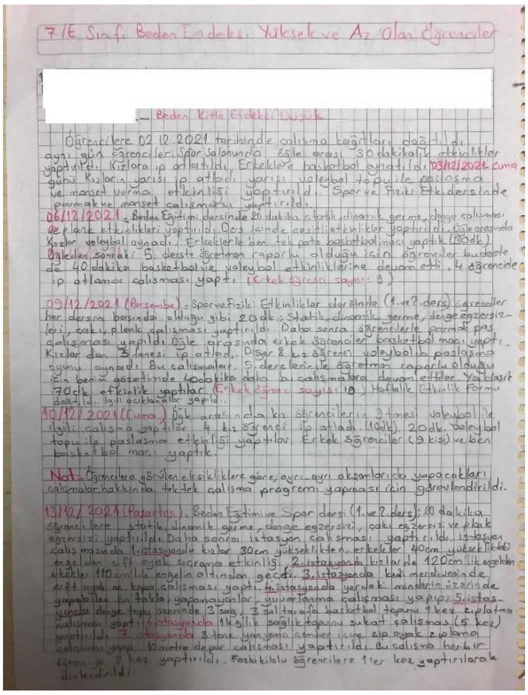


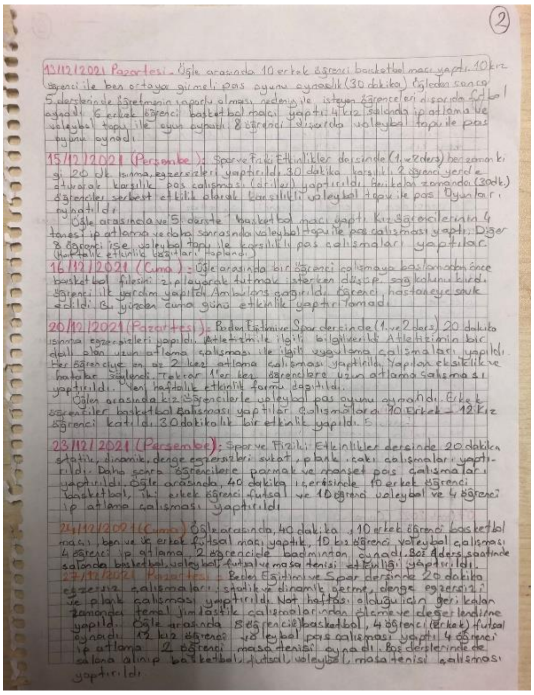
Figure 8. 16. Q-Q plot of post-test physical activity for control group

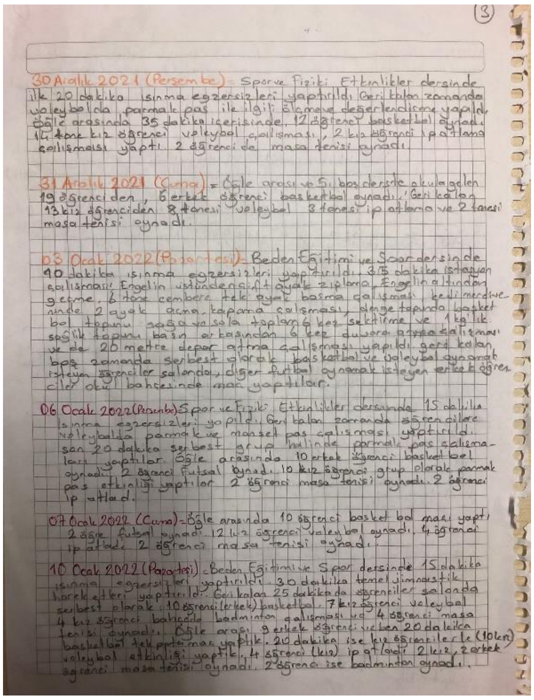
O: PEDOGOGICAL STRATEGIES SUGGESTED IN PLC MEETINGS

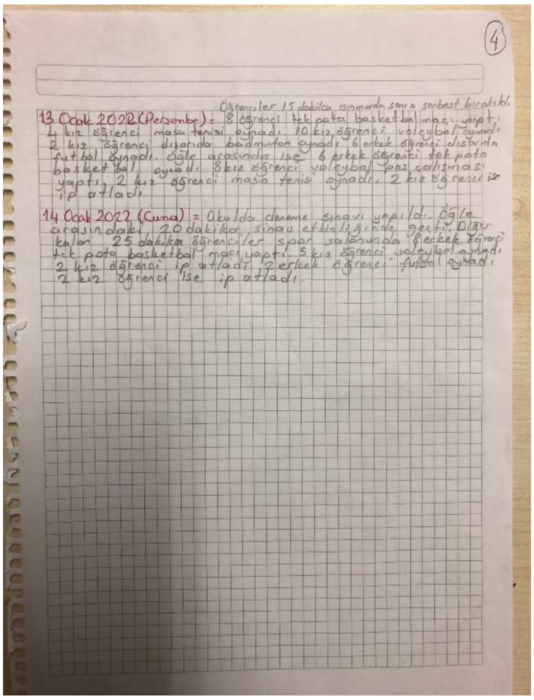
- Students may be asked to keep a weekly physical activity diary and reflect on it.
- Students can be encouraged to reach a specified goal after two to three weeks by setting a target of their needs (For example: The student can run around the school twice; the goal could be to run five times at the end of a certain period of time - Aerobic endurance)
- Students with a high body mass index and a sedentary lifestyle can particularly be provided with pedometers and given daily step tasks (recommended step count for children = 12,000). For other students, they can use pedometer apps on phones or be asked to do an equivalent exercise (cycling for an hour, Zumba on YouTube, etc.)
- Organizing various sports activities or mini-games (jumping rope, rope pulling, playing hopscotch, badminton, hemsball, etc.) during recess. (While doing this, you can reduce the workload by getting support from the students and giving responsibility)
- Families can fill out a health tree form and raise awareness about their participation in physical activity for their children's health against possible disorders (Taking a family history)
- In the courses, students can be divided into groups according to their physical needs and collaborative and cooperative work can be done. (Grouping the class according to the physical activity needs of the students)
- Out-of-school physical activities can be supported by collecting information about the physical environment in which students live, through conversation or mini-questionnaires (garden, playground, walking track, basketball court, etc.).
- Information about the sports facilities (courses, clubs, public education centers, family life centers, etc.) around the students can be collected and referrals can be made to various branches/activities according to their needs. (Connecting with extracurricular activity and informing the family)
- Students can be brought together with opportunities to experience different branches in line with their needs, a goal and application area for all of them can be found.
- A challenge can be prepared for the needs of the students to do at home in the evening (For example: waiting in the plank position for 1 minute).
- Instructors can prepare fun skill-building games, dances, and exercise programs that they can play as a family, for the students

P: ACTIVITY PLANS

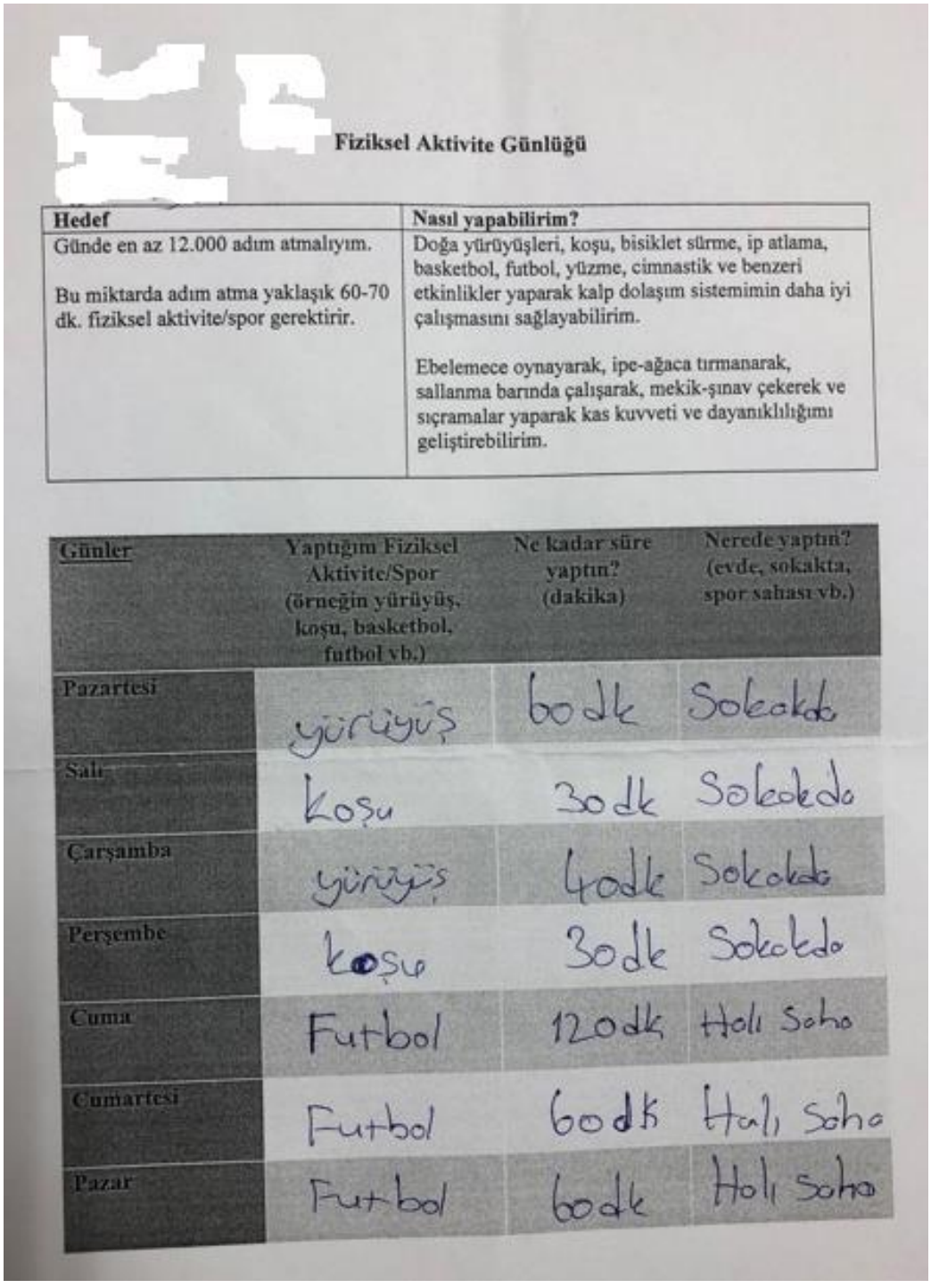








Q: PHYSICAL ACTIVITY DIARY



Fiziksel Aktivite Günlüğü

Hedef	Nasıl yapabilirim?
Günde en az 12.000 adım atmalıyım. Bu miktarda adım atma yaklaşık 60-70 dk. fiziksel aktivite/spor gerektirir.	Doğa yürüyüşleri, koşu, bisiklet sürme, ip atlama, basketbol, futbol, yüzme, cimnastik ve benzeri etkinlikler yaparak kalp dolaşım sistemimin daha iyi çalışmasını sağlayabilirim. Ebelemece oynayarak, ipe-ağaca tırmanarak, sallanma barında çalışarak, mekik-şınav çekerek ve sıçramalar yaparak kas kuvveti ve dayanıklılığımı geliştirebilirim.

Günler	Yaptığım Fiziksel Aktivite/Spor (örneğin yürüyüş, koşu, basketbol, futbol vb.)	Ne kadar süre yaptın? (dakika)	Nerede yaptın? (evde, sokakta, spor sahası vb.)
Pazartesi	yürüyüş	60dk	Sokakda
Salı	Koşu	30dk	Sokakda
Çarşamba	yürüyüş	40dk	Sokakda
Perşembe	koşu	30dk	Sokakda
Cuma	Futbol	120dk	Halı Saha
Cumartesi	Futbol	60dk	Halı Saha
Pazar	Futbol	60dk	Halı Saha

R: CURRICULUM VITAE

Serap SARIKAYA

EDUCATION

Ph.D., Department of Physical Education and Sport, Faculty of Education, Middle East Technical University, Ankara, Türkiye. Ph.D. dissertation: Effectiveness of a Data-Based Decision-Making Professional Learning Community for Physical Education Teachers and Its Impact on Students' Knowledge and Physical Activity Level, 2016-2023

MS, Department of Physical Education and Sport, Faculty of Education, Middle East Technical University, Ankara, Turkiye, Thesis: Physical Activity Level of Students and Experiences of Teachers After the Health-Related Physical Education Reform in Secondary Schools, 2013-2016

BS, School of Sport Sciences and Technology, Physical Education and Sports Teaching, Hacettepe Unıversity, Ankara, Türkiye, 2005-2010.

WORK EXPERIENCE

Research Assistant. 2013-2023, Middle East Technical University, Ankara, Türkiye, Department of Physical Education and Sport, Faculty of Education

Research Assistant. 2012-2013, Pamukkale University, Faculty of Sport Science

PUBLICATIONS

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İnce, M. L., Hünük, D., Öztürk, M. A., Tannehill, D., Yanık, M., Savucu, Y., Kavi Şimşek, N., **Sarıkaya, S**., Yılmaz, M., & Taş, H. (2021, June 7–10). Technology integrated large scale professional learning community for physical education teachers: Design and implementation [Symposium]. The AIESEP 2021 Virtual Scientific Conference, Banff, Canada.

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PROJECTS

<u>TÜBİTAK Project PhD Scholar</u>

Ince, M. L., Hünük, D., Öztürk, M. A., Savucu, Y., Yanık, M., Yıldırım, İ. S., Çapa Aydın, Y., Tannehill, D., & Ward, P. (2020). Beden eğitimi öğretmenleri için

kanıta ve Üniversite-MEB iş birliğine dayalı bir hizmet içi eğitim uygulamasının yaygınlaştırılması (Tübitak Proje No:215K460).

Social Responsibility Project

Allianz Motto Hareket, Online Movement Programs Developed (Smart-i Awards 2022, Allianz Türkiye Allianz Motto Hareket Dijital Sosyal Sorumluluk Gümüş Smart-i ödülünü almıştır.)

AWARDS

Best poster award 1st place, At AIESEP 2021 International Conference.

Sarıkaya, S., Kavi Şimşek, N., Taş, H., Yılmaz, M., Balcı, T., & Hünük, D. (2021, June 7–10). Examination of Turkish secondary school students' health-related fitness knowledge on the basis of gender and provinces [Poster session]. The AIESEP 2021 Virtual Scientific Conference, Banff, Canada.

MEMBERSHIPS

KASFAD (Kadınlar için Spor ve Fiziksel Aktivite Derneği) 2016 - ongoing

AIESEP (Association Internationale des Ecoles Supérieures d'Education Physique – International Association for Physical Education in Higher Education) 2021-ongoing

S: TURKISH SUMMARY / TÜRKÇE ÖZET

Giriş

Veri, eğitim bağlamında "okulların bazı yönlerini temsil etmek için toplanan ve düzenlenen bilgi" olarak tanımlanmaktadır (Lai & Schildkamp, 2013). Bu tanım, okul ortamında halihazırda mevcut olan bazı "veri" kavramlarına ve anlayışlarına meydan okumaktadır. Hamilton vd. (2009), bazı okul ortamlarında verilerin, özellikle de ölçülebilir (sayısal) standartlaştırılmış değerlendirmeler veya ulusal test sonuçları gibi test verileri olarak oldukça sınırlı bir şekilde nitelendirildiğini tartışmıştır. Ancak bu anlayış oldukça yetersizdir çünkü veriler, girdi verileri (örn. öğrenci geçmiş verileri), süreç verileri (örn. sınıf gözlemleri ve öğretmen görüşmeleri), bağlam verileri (örn. bina hakkında bilgiler) ve çıktı verileri (örn. öğrenci başarı verileri) gibi okulun işleyişiyle ilgili yapısal olarak toplanan her türlü nitel veya nicel veriyi içerir (Ikemoto & Marsh, 2007).

Bu çalışmada, veriye dayalı karar verme (VDKV), eğitim ortamlarındaki uygulama ve politikaları bilgilendirmek için verilerin sistematik olarak toplanması, analizi, incelenmesi ve yorumlanması anlamına gelir (Mandinach, 2012). Coburn ve Turner (2011) tarafından önerildiği üzere, veri kullanımı, eğitim uygulamalarının uyarlanmasıyla ilgili kararlarda temel olarak elde edilen bilgilerin kullanılması ve ardından bu uyarlamaların istenen etkiye sahip olup olmadığının değerlendirilmesi için verilerin toplanması, analiz edilmesi ve yorumlanması sürecinin tamamını içerir.

Schildkamp ve Poortman (2015) veri kullanım sürecini literatüre dayandırarak şu şekilde açıklamıştır; verinin bilgiye dönüştürülmesi hangi veriye neden ihtiyaç duyulduğu sorularını ele alan açık/anlaşılır bir amaçla başlar. Veri toplayıcının, toplanan verilerin cevaplanmasına yardımcı olacağı bir sorusu olmalıdır. Net bir amaç olmadan, karar verme için yararlı olmayan çok sayıda veri toplamak zaman ve kaynak israfına yol açabilir. Net bir amaç olduğunda, olası veri kaynaklarından hangi verilerin toplanması gerektiğine karar vermek daha kolaydır. Ardından, verilerin analiz

edilmesi; verilerin amaca uygun bir şekilde bağlam sallaştırılması, kategorize edilmesi, hesaplanması, ilişkilendirilmesi ve özetlenmesini içerir (Davenport & Prusak, 1998). Bir sonraki adım verileri yorumlamaktır. Yorumlama, verilerin anlamlandırılması ve gelecekteki eylemler için çıkarımlarda bulunulmasıdır. Verilerin yorumlanması bazen daha fazla veri toplama ve analiz etme ihtiyacına neden olabilir. Ancak verilerden elde edilen sonuç net olduğunda, verilere dayalı olarak uygun eylem gerçekleştirilebilir (Schildkamp & Poortman, 2015).

VDKV, eğitim ortamlarında hesapverebilirlik için bir sistem olmanın ötesinde, sınıf düzeyinde öğrenci merkezli bir öğretim aracıdır. Öğretmenlere, öğretimlerini sınıf ve öğrencilerin bireysel öğrenme ihtiyaçlarına göre uyarlamalarına yardımcı olacak bilgiler sağlayarak farklılaştırılmış öğretimi destekler (Rallis & Macmullen, 2000). VDKV, öğrencilerin mevcut öğrenmeleri ile öğretim programında istenen öğrenme çıktıları arasındaki boşluğu ele alarak öğrenci başarısını artırabilir (Lai vd., 2014; van Geel vd., 2016). VDKV'nin öğrencilerin öğrenmesine katkıları literatürde defalarca tartışılmış olsa da (Carlson vd., 2011; Gelderblom vd., 2016; McNaughton vd., 2012; Poortman & Schildkamp, 2016), bazı bulgular okulların VDKV'yi etkili bir şekilde uygulamakta hala zorlandıklarını göstermektedir (Mandinach & Gummer, 2013; Marsh, 2012). Schildkamp ve Poortman (2015) okullarda verilerin etkili bir şekilde kullanılmasındaki bu zorluğun altında yatan kritik nedenin eğitimcilerin veri okuryazarlığı olduğunu ileri sürmüştür.

Veri okuryazarlığı, eğitimcilerin VDKV'yi uygulama becerisini ifade eder ve eğitimcilerin bir amaç belirleme, veri toplama, analiz etme ve yorumlama ve öğretimsel eylemde bulunma becerisi olarak açıklanabilir (Hamilton vd., 2009; Mandinach & Gummer, 2016; van Geel vd., 2016). Veri okuryazarlığı, eğitimde verilerin etkili bir şekilde kullanılması için gerekli olduğu varsayılan belirli bilgi ve becerileri içerir (van Geel vd., 2017). Örneğin, Mandinach vd. (2006) veriyi bilgiye dönüştürmenin eğitimciler için oldukça önemli olduğunu savunmuştur. Dolayısıyla, bu dönüşüm için veri toplama ve düzenleme, verileri analiz etme ve özetleme, verileri sentezleme ve önceliklendirme gibi çeşitli becerilere ihtiyaç duyulmaktadır. Mandinach (2012) veri okuryazarlığına ilişkin bu bakış açısını, verinin yorumlanması ve kullanılması için gerekli bilgi ve beceriler bağlamında genişletmiştir. Genişletilmiş

tanım, sayılar, analiz sonuçları ve istatistikler gibi bilgilerin öğrencilerin ihtiyaçlarını karşılayan ve istenen sonuçlara götüren öğretim stratejilerine dönüştürülmesini içermektedir.

Veriye dayalı kararlar hesap verebilirlik, okul gelişimi ve öğretim olmak üzere üç ana amaç altında sınıflandırılabilir (Schildkamp vd., 2017). Hesap verebilirlik için veri kullanımı, örneğin müfettişlere okul yönetimi ve performansıyla ilgili hesap verebilir ve kaliteli bilgi sağlamak için okul yönetimi tarafından dış raporlarda verilerin kullanılmasını ifade eder (Wohlstetter vd., 2008; Young, 2006). Bununla birlikte, Schildkamp vd. (2017) tarafından tartışıldığı üzere, eğitimde veri kullanımı, okul gelişiminden sınıf ve öğretimle ilgili kararlar almaya kadar birçok karar türünde giderek artan bir önem kazanmıştır. Okul gelişimi için veri kullanımı, öğretim programını değerlendirmek ve yeniden şekillendirmek (Anderson vd., 2010; Brunner vd., 2005), okul başarısının gelişimi için yıllık hedefleri belirlemek ve etkili öğretim yöntemlerine karar vermek için veri kullanımı olarak açıklanabilir (Breiter & Light, 2006; Wayman & Stringfield, 2006; Wohlstetter vd., 2008).

Veriler, bu çalışmanın ana odağı olan öğretim amaçlı olarak da kullanılabilir. Öğretmenler verileri öğrenciler için öğrenme hedefleri belirlemek, öğrencilerin hangi konuları ve becerileri kavrayıp kavramadıklarını belirlemek, öğrencilerin zaman içindeki gelişimlerini/ilerlemelerini değerlendirmek, öğretimi bireysel öğrenci ihtiyaçlarına göre uyarlamak, derslerin hızını ayarlamak, öğrencilere öğrenme süreçlerini desteklemek için gerekli geri bildirimleri vermek, hedeflenen öğretim için daha küçük öğrenci grupları oluşturmak, sınıfta sunulacak öğretim içeriğini belirlemek, öğrencilerin neden belli hataları yaptığını incelemek, ve öğretimi hem üstün yetenekli ve hem de özel gereksinimli öğrencilerin ihtiyaçlarına göre uyarlamak için kullanılabilir (Schildkamp & Kuiper, 2010; Schildkamp vd., 2013; Wohlstetter vd., 2008; Young, 2006). Bu bağlamda, veri kullanımı, öğretmenlere öğrencilerin ihtiyaçlarına ilişkin temel göstergeler sağlamanın ve öğretimlerini buna göre uyarlamanın ve düzenlemenin değerli bir yolu olarak kabul edilebilir (Keuning & van Geel, 2016).

Birçok çalışma da okulun örgütsel özellikleri, veri özellikleri ve kullanıcı özellikleri gibi faktörlerin öğretmenlerin veri kullanımını etkilediğini göstermektedir (Hoogland vd., 2016; Schildkamp vd. 2017; Schildkamp & Poortman, 2015). Bir okulun örgütsel yapısı, okulda hangi verilerin hangi amaçlarla kullanılacağını etkileyebilir (Schildkamp & Kuiper, 2010). Kurum içinde ortak bir vizyona sahip olmak ve okul, sınıf ve öğrenci düzeyinde ölçülebilir hedeflere sahip olmak da çok önemli görünmektedir. Net hedefler olmadığında verileri kullanmak zordur çünkü verileri karşılaştırmak için herhangi bir ölçüt yoktur (Datnow vd., 2007; Kerr vd., 2006; Wohlstetter vd., 2008).

Veri özellikleri, verilerin okul gelişimi, hesap verebilirlik ve öğretim için kullanım amaçlarını etkileyebilir. İyi işleyen bilgi yönetim sistemlerine ve ilgili, güvenilir ve geçerli verilere erişimi olan okulların veri kullanım düzeyinin artması daha muhtemeldir (Breiter & Light, 2006; Hoogland vd., 2016; Reeves vd., 2016). Ayrıca, veri kullanımı büyük ölçüde kullanıcının özelliklerine de bağlıdır. Birçok çalışma veri okuryazarlığının öneminden bahsetmektedir (Mandinach, 2008). Verileri analiz etmek, yorumlamak ve verilere dayanarak eyleme geçmek belirli bilgi ve beceriler gerektirir. Bu nedenle, bireysel veri kullanıcısı düzeyindeki faktörleri de göz ününde bulundurmak gereklidir (Jimerson & Wayman, 2012; Little, 2012; Wohlstetter vd., 2008).

Veri okuryazarlığı ve kullanımını desteklemek için kaliteli ve sürdürülebilir mesleki gelişim fırsatlarına yönelik çeşitli çağrılar yapılmıştır (Ince vd., 2020; Mandinach vd., 2006; Means vd., 2010). Bu tür mesleki gelişim programları temel olarak öğretmenlerin veri kullanımına yönelik bilgi, beceri ve tutumlarını geliştirmeye odaklanmaktadır. Bununla birlikte, temel amaç her zaman öğretimi ilerletmek ve öğrenci öğrenimini ve başarısını teşvik etmek olmuştur (Reeves ve Honig, 2015; Schildkamp ve Kuiper, 2010). Timperley ve diğerleri (2007), öğretmenlerin ve okul yöneticilerinin, öğrencilerinin gelişimlerini ve/veya ihtiyaçlarını izlemek ve uygulamalarının etkililiğini ve/veya uygunluğunu test etmek için veri toplamaları ve tüm verileri sınıflarında ve okullarında uygun şekilde kullanmaları halinde, mesleki gelişim programlarının öğrenci öğrenmesini ve başarısını teşvik etmede oldukça başarılı olabileceğini tartışmıştır.

Mesleki gelişim, veri kullanım becerilerinin geliştirilmesinde önemlidir (Marsh, 2012) ve Lomos vd. (2011) mesleki gelişim topluluğunun bu becerilerin geliştirilmesine yardımcı olduğunu öne sürmektedir. Mesleki gelişim topluluğu (MGT), deneyimlerini ve düşüncelerini paylaşarak işbirliğine dayalı öğrenmeye odaklanan öğretmenlerden oluşur ve birçok çalışmanın öğretmen ve öğrenci öğrenmesini geliştirmek için öğretmen işbirliğinin destekleyici yönüne işaret ettiği görüşünü destekler (Borko, 2004; Stoll vd., 2006; Vescio vd., 2008).

MGT, birçok akademisyen tarafından destekleyici olarak görülmekte ve öğretmenlerin mesleki gelişiminde etkili bir araç olarak kullanılmaktadır (Hunuk vd., 2013; Parker vd., 2010; Tannehill vd., 2021; Wenger, 1998). Bu bakış açısını ve kaliteli mesleki gelişimi sağlamak için, az sayıda grup üyesinden oluşan ve birbirlerinden öğrenmeyi teşvik eden öğrenme toplulukları, çok sayıda kişiyle belirli konularda tek seferlik toplantılara atıfta bulunan, tartışma ve birbirlerinden öğrenme açısından destekleyici olmayan geleneksel öğrenme yaklaşımlarına kıyasla çok daha iyi görünmektedir (Hunuk vd., 2013; Patton vd., 2013; Tannehill vd., 2021). Araştırmalar MGT'nin daha etkili olabilmesi için sahip olması gereken özellikleri şu şekilde özetlemiştir; ortak bir hedef, öğrenci öğrenmesine odaklanma, öğretmen işbirliği, yansıtıcı sorgulama, verilerin analizi ve yorumlanması (Lomos vd., 2011; Vescio vd., 2008; Desimone, 2011).

Türkiye'de beden eğitimi öğretmenlerine yönelik geniş ölçekli bir MGT kullanılarak yapılandırılan bir projede (İnce vd., 2020; TÜBİTAK Proje No: 215K460) beden eğitimi alanına özgü yeterlilik bulgularına göre ölçme ve değerlendirme, öğretmenlerin kendilerini en az yetkin hissettikleri konular arasındadır. Mevcut beden eğitimi ve spor programlarında öğrencilerin fiziksel aktivite düzeylerinin ve sağlıkla ilgili fiziksel uygunluklarının (SiFU) geliştirilmesi müfredatın temel amaçları arasında yer almaktadır (MEB, 2018). TÜBİTAK projesindeki nitel bulgulara göre, öğretmenler çeşitli fiziksel uygunluk ölçüm yöntemleri kullanarak öğrencilerinden veri toplamaktadır; ancak verileri analiz ederek öğrencilerinin ihtiyaçlarını belirleme, dersleri öğrencilerin ihtiyaçlarına göre tasarlama ve gelişimi değerlendirme konusunda yetersiz oldukları anlaşılmaktadır (İnce vd., 2020).

Öğretmenlerin ilgili kavramlar konusundaki bilgi ve beceri eksikliklerinin çeşitli nedenleri olabilir. Bunlar arasında öğretmen olarak atandıktan sonra mesleki gelişimlerine önem verilmemesi, öğretmenlere sunulan hizmet içi eğitim programlarının öğretmenlerin ihtiyaçları doğrultusunda tasarlanmaması, beden eğitimi öğretmenlerinin mesleki performanslarının öğretim programında belirtilen hedefler yerine ilgisiz kriterlerle (örn. okul takımı başarısı) değerlendirilmesi sayılabilir (İnce vd., 2020). Lisans ve mesleki gelişim programlarında öğretmenlerin verileri etkili ve sorumlu bir şekilde kullanabilmeleri için gerekli bilgi ve becerilerle donatılmaları gerektiği vurgulanmasına ve kabul edilmesine rağmen, öğretmenlerin kapasitelerini geliştirmeye yönelik yeterli çaba gösterilmemektedir.

Bilindiği kadarıyla, Türkiye'de beden eğitimi ve spor öğretmenlerinin VDKV bilgi ve becerilerini geliştirmek için özel olarak tasarlanmış bir mesleki gelişim programı bulunmamaktadır. VDKV'de önemli bir zorluk, öğretimi bu yönde dönüştürecek etkili mesleki gelişim uygulamalarının belirlenmesi ve uygulanmasıdır (Hamilton vd., 2009). Yukarıda tartışılan tüm konular göz önünde bulundurulduğunda, bu çalışmanın amacı iki yönlüdür; (1) ortaokul beden eğitimi öğretmenleri için bir veriye dayalı karar verme mesleki gelişim programı (VDDM-MG) tasarlamak ve (2) bu programın beden eğitimi öğretmenlerinin veri kullanımı, öğretim uygulamaları ve öğrencilerinin öğrenmeleri üzerine etkilerini incelemektir.

Son yıllarda yapılan çalışmalarda kaliteli mesleki gelişimin önemi ve özellikleri vurgulanmaktadır (Betchel & O'Sullivan, 2006; Kulinna vd., 2008). Çeşitli araştırmaların sonuçları, kaliteli bir mesleki gelişim programının öncelikle öğretmenlerin ihtiyaçları doğrultusunda hazırlanması, zorlayıcı ve entelektüel açıdan teşvik edici olması gerektiğini vurgulamaktadır (Armour & Yelling, 2007; Betchel & Sullivan, 2006). Ayrıca, öğretmenler mesleki gelişim programlarında kendilerini bir grup üyesi olarak görebilmeli ve gruptaki diğer kişilerle işbirliği yapma fırsatı bulabilmelidir (Betchel & Sullivan, 2006). Dolayısıyla, bu çalışmada, beden eğitimi öğretmenlerinin VDKV bilgi ve becerilerini geliştirmek için bir MGT oluşturmak ve sürdürmek uygun bir yöntem olarak görülmüştür.

Tüm yukarıdaki bilgiler doğrultusunda bu çalışma aşağıdaki araştırma sorularını yanıtlamaya çalışmaktadır.

1. Beden eğitimi öğretmenlerinin veri kullanımı ile ilgili uygulamaları ve ihtiyaçları nelerdir?
   1a. Beden eğitimi öğretmenlerinin veri kullanımını etkileyen faktörler nelerdir?
   1b. Veriler beden eğitimi öğretmenleri tarafından hangi amaçlar için kullanılır?
2. MGT olarak yapılandırılmış bir VDKV-MG programı öğretmenlerin veri kullanımlarını, öğretim uygulamalarını ve öğrencilerinin SiFU bilgilerini ve fiziksel aktivite düzeylerini nasıl etkiler?
   2a. MGT olarak yapılandırılmış bir VDKV-MG programı öğretmenlerin veri kullanımlarını ve öğretim uygulamalarını nasıl etkiler?
   2b. Öğretmenlerin MGT olarak yapılandırılmış bir VDKV-MG programına katılımı öğrencilerinin SiFU bilgilerini ve fiziksel aktivite düzeylerini nasıl etkiler?
3. Öğretmenlerin VDKV-MG programının tasarımı, uygulanması ve sonuçlarına ilişkin görüşleri nelerdir?

Yöntem

Bu çalışmada birleşik desen karma yöntem tasarımı kullanılmıştır (Creswell & Plano Clark, 2018). Bu tasarımda, nicel ve nitel veriler ayrı ayrı toplanır ve analiz edilir ve daha sonra bu sonuçları karşılaştırmak veya bir araya getirmek için birleştirilir (Creswell & Plano Clark, 2018). Çalışmanın nitel bölümüne sadece deney grubundaki öğretmenler dahil edilmiştir.

Çalışmada gruplar arası deneysel desen (ön test/son test) kullanılmıştır (Creswell, 2012). Çalışmanın katılımcılarını 12 beden eğitimi öğretmeni (6'sı deney ve 6'sı kontrol grubunda) ve onların 331 yedinci sınıf öğrencisi (167'si deney ve 164'ü kontrol grubunda) oluşturmaktadır. Öğretmenler Ankara'nın Etimesgut, Sincan, Yenimahalle ve Çankaya olmak üzere dört ilçesinde görev yapmaktadır. Öğretmenlerin çalışmaya dahil edilme kriterleri okul türü (devlet ya da özel), 7. sınıfları okutuyor olmaları ve Ankara'nın bir ilçesinde görev yapıyor olmalarıdır.

Bu çalışma 2021-2022 akademik yılının güz döneminde gerçekleştirilmiş ve 16 hafta sürmüştür. Çalışma dört aşamadan (ihtiyaç analizi ve verilerin toplanması, müdahale, uygulama, verilerin toplanması) oluşmaktadır ve her aşamada çeşitli veri toplama araçları ile veriler toplanmıştır. Çalışmanın ilk aşamasında, ihtiyaç analizi için deney grubundaki öğretmenlerle veri kullanımı bilgi ve becerileri ve öğretim uygulamaları ile ilgili yarı yapılandırılmış görüşmeler yapılmıştır. Ayrıca, "İlköğretim ikinci Kademe Öğrencileri için Sağlıkla İlgili Fiziksel Uygunluk Bilgi Testi" (İnce & Hünük, 2013) ve "Çocuklar için Fiziksel Aktivite Anketi" (Erdim vd. 2019) kullanılarak hem deney hem de kontrol grubundaki öğrencilerin SiFU bilgileri ve fiziksel aktivite seviyelerini belirlemek için ön testler yapılmıştır. Öğrencileri verileri müdahalenin bir parçası olarak öğretmenleri tarafından toplanmıştır.

Çalışmanın ikinci aşamasında (müdahale), deney grubundaki öğretmenler altı hafta boyunca haftada bir kez bir kolaylaştırıcı, bir veri işleme uzmanı ve bir araştırmacı (kendim) eşliğinde toplantılara katılmışlardır. Toplantılar yerel bir üniversitenin görsel-işitsel eğitim teknolojileriyle donatılmış bir beden eğitimi ve spor laboratuvarında gerçekleştirilmiştir. Haftalık toplantılar katılımcıların uygun gün ve saatlerine göre planlanmış ve 1,5-2 saat arasında sürmüştür. Katılımcıların izniyle tüm toplantılar daha sonra analiz edilmek üzere video/ses kaydına alınmış. Ayrıca, araştırmacı tarafından Microsoft Excel programında veri analizi, verilerin grafiksel gösterimi ve yorumlanması için öğretmenleri desteklemek amacıyla resmi olmayan grup ve bireysel toplantılar düzenlenmiştir. Araştırmacı tüm aşamada saha notları almıştır.

Çalışmanın üçüncü aşamasında (uygulama), öğretmenlerden öğrencilerinden elde ettikleri verilere dayanarak derslerini tasarlamaları ve uygulamaları beklenmiştir. Öğretmenlere derslerinde kullanabilecekleri çeşitli eğitsel kaynaklar sunulmuştur. Araştırmacı her bir öğretmenle kendi okullarında bağımsız olarak bir araya gelmiş ve her bir öğretmenin beden eğitimi ve spor derslerinden birini gözlemlemiştir. Bu süreç boyunca araştırmacı tarafından saha notları alınmıştır.

Çalışmanın dördüncü aşamasında, müdahalenin veri kullanımı ve öğretim uygulamaları üzerindeki etkisini incelemek ve VDKV-MG programını genel olarak

değerlendirmek için deney grubu öğretmenleri ile yarı yapılandırılmış görüşmeler yapılmıştır. Tüm görüşmeler, katılımcıların izniyle dijital olarak kaydedilmiş ve analiz için kelimesi kelimesine yazıya aktarılmıştır. Tüm öğrencilere SiFU bilgi testi ve fiziksel aktivite anketi son test olarak öğretmenleri tarafından tekrar uygulanmıştır.

Nitel verilerin analizinde sürekli karşılaştırmalı veri analizi yöntemi (constant comparative data analysis method) uygulanmıştır (Glaser & Strauss, 1967). Çalışmanın geçerlik ve güvenirliğinin sağlanabilmesi için veri üçlemesi, katılımcı teyidi ve uzman görüşü yöntemleri kullanılmıştır (Creswell, 2009; Patton, 2002). Ayrıca, nicel verilerin analizinde tanımlayıcı istatistikler ve karışık ölçümler için iki yönlü varyans analizi kullanılmıştır ($p < .05$).

Bulgular

Birinci Araştırma Sorusunun Bulguları

Bu araştırma sorusu öğretmenlerin veri kullanımını etkileyen faktörleri ve veri kullanım amaçlarını incelemeyi amaçlamaktadır. Temaların belirlenmesinde Schildkamp vd. (2017) tarafından geliştirilen kavramsal çerçeve kullanılmıştır.

1a. Beden eğitimi öğretmenlerinin veri kullanımını etkileyen faktörler nelerdir?
Araştırma sorusu 1a için nitel bulgular, veri özelliklerinin, kullanıcı özelliklerinin ve okul organizasyon özelliklerinin beden eğitimi öğretmenlerinin veri kullanımını etkilediğini ortaya koymuştur.

Veri özellikleri: Öğretmenler beden eğitimi dersinde öğrencilerinden sadece SiFU verileri toplamaktadır. Bu verinin toplanma sebebi öğretmenlerin bir eğitim-öğretim yılında iki kez olmak üzere belirli tarihlerde öğrencilerin SiFU parametrelerini ölçmeleri ve elde edilen verileri e-okul sistemine girmelerinin beklenmesidir (MoNH & MEB, 2017). Araştırma bulgularından, öğretmenlerin bu ölçümlerle ilgili herhangi bir eğitim almadığı, sadece eğitim videolarının hazırlandığı ancak yeterince yaygınlaştırılmadığı ve yetkililerin ölçüm için okullara materyal desteği sağlamadığı anlaşılmaktadır. Ayrıca öğretmenler SiFU veri toplama protokolünde sorunlar

olduğunu ve dolayısıyla öğretimsel karar vermede SiFU verilerinin güvenilir ve doğru olmadığını düşünmektedirler.

Veri kullanıcı özellikleri: Öğretmenler SiFU verilerini hangi amaçla topladıklarını ve nasıl kullanacaklarını bilmemektedir. Çünkü öğretmenler bu verileri sadece toplamakta ve e-okul yönetim sistemine girmektedir. Öğretmenler tarafından toplanan bu veriler e-okul sisteminde otomatik olarak değerlendirilir ve öğrencilere sistem üzerinden bireysel olarak sunulur.

Ayrıca, öğretmenlere veri kullanımı (toplama, analiz etme, yorumlama, raporlama ve görselleştirme) ile ilgili kendilerini nasıl değerlendirdikleri sorulmuştur. Öğretmenler, SiFU parametrelerine ilişkin veri toplama konusunda kendilerini yeterli görmektedir ve veri toplama sürecinde herhangi bir sorun yaşamamaktadır. Eğitim teknolojisi (Microsoft Excel) kullanımı bakımından, öğretmenlerin çoğu ilgili becerilere sahip olduklarını düşünmektedir. Ancak, VDKV müdahalesine kadar derslerde kullanmak üzere verileri analiz etme, yorumlama ve görselleştirme ihtiyacı duymadıkları anlaşılmaktadır. Dolayısıyla veri toplama dışında veri kullanım sürecinde herhangi bir deneyimleri olmamıştır.

Okulun örgütsel özelliklerine bakıldığında, okullarda beden eğitimi ve spor dersleri için veri kullanımına ilişkin sınırlı düzenlemeler ve uygulamalar olduğu anlaşılmaktadır. Bu bağlamda, eğitimciler arasında ortak bir vizyon, norm ya da iş birliği yoktur. Ayrıca, okullarda eğitimcilerin veri kullanımını destekleyecek bir veri uzmanı da bulunmamaktadır. Okul müdürlerinin beden eğitimi derslerinde veri kullanımı ile ilgili çok az teşviki veya beklentisi vardır. Beden eğitimi öğretmenlerinden sadece SiFU verilerini toplamaları ve bunları hesapverebilirlik amacıyla e-okul sistemine girmeleri beklenmektedir.

1b. Veriler beden eğitimi öğretmenleri tarafından hangi amaçlar için kullanılır?

Bu araştırma sorusu için nitel bulgular, beden eğitimi öğretmenlerinin verileri öğrencilerin öğrenme ihtiyaçlarını belirleme, dersleri tasarlama ve öğrencilerin gelişimini izleme gibi öğretimsel amaçlar için değil, yalnızca hesapverebilirlik

amacıyla kullandıklarını göstermektedir. Öğretmenler, beden eğitimi derslerinde konu ile ilgili değerlendirme verileri dışında okul yöneticilerine hesapverebilirlik amacıyla öğrencilerinden yalnızca SiFU verilerini toplamaktadır. Bu veriler zorunlu olarak toplandığı için okul müdürlerinin bu verileri ilgili zamanlarda e-okul sistemine girmekle ilgilendikleri, ancak sonuçlarla ilgilenmedikleri anlaşılmaktadır. Veriler, okulun öğrenci başarısını, yıllık okul hedeflerini ve öğretmenlerin mesleki gelişim ihtiyaçlarını belirlemek gibi okul gelişimi amaçları için kullanılabilecekken, okul müdürlerinin sadece okul takımlarıyla ilgili verilerle (madalya sayısı, kupalar, lisanslı sporcular, spor branşı, müsabakalar) ilgilendikleri ifade edilmiştir.

İkinci Araştırma Sorusunun Bulguları

İkinci araştırma sorusu MGT olarak yapılandırılmış bir VDKV-MG programının a) öğretmenlerin veri kullanımı ve öğretim uygulamalarını ve b) öğrencilerinin SiFU bilgisi ve fiziksel aktivite düzeylerini nasıl etkilediğine odaklanmıştır.

Araştırma sorusunun ilk bölümünde, VDKV-MG programının beden eğitimi öğretmenlerinin veri kullanımı becerileri, bilgileri ve öğretim uygulamaları üzerindeki etkisini incelemek için yarı yapılandırılmış görüşmeler, ders gözlemleri, araştırmacı alan notları ve altı hafta boyunca yapılan MGT toplantı verileri sürekli karşılaştırmalı veri analizi yöntemi ile analiz edilmiştir. Bulgulara göre iki ana tema ortaya çıkmıştır: 1) VDKV-MG programı öğretmen öğrenmesi ve 2) Öğretmenlerin VDKV ile ilgili öğretim uygulamaları.

Tema 1: VDKV-MG programı öğretmen öğrenmesi
Bu tema için iki kategori oluşturulmuştur: 1) Öğretim için veri kullanımı farkındalığı ve 2) Mesleki bilgi ve beceri gelişimi.

Öğretim için veri kullanımı farkındalığı kategorisi, öğrencilerin ihtiyaçlarını belirleme, öğrencileri tanıma, öğrencilerin farkındalığı ve motivasyonu olmak üzere üç alt kategoriden oluşmaktadır. Öğretmenlerin kendi verilerini toplamanın, analiz etmenin ve yorumlamanın bir sonucu olarak; verilerin öğretim amacıyla öğrencilerin öğrenme ihtiyaçlarını belirlemek, öğrencileri tanımak, öğrencilerin bireysel

ihtiyaçlarına ilişkin farkındalıklarını ve fiziksel aktiviteye katılım motivasyonlarını artırmak için kullanılabileceği ile ilgili farkındalıkları artmıştır.

Tema 1'in ikinci kategorisi olan mesleki bilgi ve beceri gelişimi, alan bilgisi ve ölçme ve değerlendirme olmak üzere iki alt kategori içermektedir. Bulgular, öğretmenlerin VDKV müdahalesinden sonra mesleki alan bilgilerinde gelişim olduğunu, MGT toplantılarında birbirlerinin deneyimlerinden öğrendiklerini, toplantılarda edindikleri yeni bilgileri araştırdıklarını ve mevcut alan bilgilerini güncelleddiklerini göstermektedir. Öğretmenlerin müfredattaki disiplinler arası yaklaşımla ilgili farkındalıkları artmış ve fen bilgisi öğretmenleriyle işbirliği yapmak için stratejiler geliştirmişlerdir.

Araştırmacının alan notları, öğretmenlerin VDKV-MG programından sonra ölçme ve değerlendirmeyi neden ve nasıl yapacaklarını anlamlandırdıklarını göstermektedir. Öğretmenlerin en önemli kazanımları verileri analiz etme, yorumlama ve görselleştirme konularında olduğu görülmüştür. Özellikle verileri görselleştirmenin önemi ve görsel verilerin öğrenciler üzerindeki etkisi vurgulamışlardır.

Tema 2: Öğretmenlerin VDKV ile ilgili öğretim uygulamaları

Yarı yapılandırılmış görüşmeler, 6. hafta MGT toplantısının video kaydı, alan notları ve gözlemler incelendikten sonra, öğretmenlerin VDKV öğretim uygulamaları için (1) fiziksel aktivitenin artırılması ve (2) bilgi aktarımı kategorileri ortaya çıkmıştır.

Öğretmenler, fiziksel aktivite anketi sonuçlarına göre öğrencilerinin çoğunun beden eğitimi dersleri dışında yeterince fiziksel aktiviteye katılmadığını ortaya koydu. Öğretmenler, MGT toplantılarında öğrencilerin fiziksel aktiviteye katılımını artırmak için pedagojik stratejileri tartıştılar. Uygulama haftaları boyunca öğretmenler, öğrencilerinin ihtiyaçlarına ve okul olanaklarına göre bu stratejilerden bazılarını kullanmışlardır. Öğrencilerin fiziksel aktiviteye katılımını artırmaya yönelik pedagojik stratejiler iki kategoride toplanmıştır: okul içi uygulamalar ve okul dışı uygulamalar. Okul içi uygulamalar kategorisi, teneffüs ve öğle arası etkinlikleri, adımsayar kullanımı, gözlem- görüşme ve veli toplantılarında veri kullanımından oluşmaktadır.

Öğretmenler, okul saatleri içerisinde ve beden eğitimi derslerinde öğrencilerinin fiziksel aktivitelerine müdahale edebildiklerini ancak okul saatleri dışında bunun mümkün olmadığını belirtmişlerdir. Bu nedenle, öğrencilerin fiziksel aktivite düzeylerini artırmak için çeşitli okul dışı stratejiler/uygulamalar (ödevler/görevler ve çeşitli spor branşlarına veya etkinliklere yönlendirme) kullanmışlardır.

Öğretmenler öğrencileri görevlendirirken adım adımsayar (akıllı saatler, telefonlar), fiziksel aktivite günlükleri, çevrimiçi kaynaklar (videolar) ve bireysel egzersiz planlarından yararlanmıştır. Öğrencileri fiziksel aktiviteye teşvik etmek için fiziksel aktivite günlüğü tutmaları ve her gün ortalama 12.000 adım atmaları ya da günde en az bir saat düzenli fiziksel aktiviteye katılmaları istenmiştir. Fiziksel aktivite günlükleri ve adımsayarların öğrencilerin fiziksel aktivite düzeyini artırmada etkili araçlar olduğu anlaşılmaktadır.

Ayrıca öğretmenler, araştırmacı tarafından kendilerine sağlanan çevrimiçi kaynakları (etkinlik videoları) kullanmışlardır. Bulgular, video kaynakların özellikle kız öğrenciler ve fiziksel uygunluk parametrelerinde sorun yaşamayan öğrenciler için etkili olduğunu göstermektedir. Ayrıca, öğretmenlerden biri fiziksel aktivite anketi ve HrF testinden elde edilen verileri kullanarak öğrencilerin ihtiyaçlarına göre bireysel egzersiz programları hazırlamıştır. Diğer öğretmenler ise öğrencilerin yaşadıkları çevredeki çeşitli spor olanaklarını araştırmış ve çeşitli branşlara öğrencilerini yönlendirmişlerdir.

Tema 2'nin ikinci kategorisi olan bilgi aktarımı, ders uygulamaları (teorik ve uygulamalı dersler) ve disiplinler arası işbirliği alt kategorilerinden oluşmaktadır.

Öğretmenlere, HrF bilgi testi ile öğrencilerinden veri topladıktan, analiz ettikten ve yorumladıktan sonra öğretim uygulamalarında yaptıkları düzenlemeler sorulmuştur. Öğretmenler bilgi testinde özellikle en çok hata yapılan sorular belirlediklerini ve derslerde bu konulara yer vermeye çalıştıklarını belirtmişlerdir. Başka bir deyişle, derslerini tasarlarken ve uygularken öğrenci verilerini dikkate almışlardır. Uygulama haftalarında öğretmenler hem teorik hem de uygulamalı dersler gerçekleştirmiştir. Öğretmenlerin bir kısmı bilgi testini öğrencilerle birlikte sınıfta soru-cevap şeklinde

çözmüş ve sonrasında detaylı bilgi vermiştir. Alan notlarına göre öğretmenler bilgiyi uygulamalı derslere entegre etmektense sınıfta aktarmayı tercih etmektedirler. Öğretmenler teorik derslerde akıllı tahta, SiFU ile ilgili çeşitli görseller, kaynaklar ve videolar kullanmışlardır.

Araştırmacı tarafından yapılan ders gözlemlerine göre, öğretmenler SiFU testinden elde ettikleri verileri ders tasarımında kullanmışlardır. Öğretmenlerin derslerinde sağlık ve fiziksel aktivitenin önemi, günlük 12.000 adım hedefi, ısınma ve soğumanın önemi, nabız sayısı ve hızı, nefes kontrolü, aerobik ve anaerobik kavramları hakkında bilgiler paylaştıkları gözlemlenmiştir. Bu gözlemler, görüşme bulguları ve son MGT toplantısındaki öğretmen söylemleriyle benzerlik göstermektedir. Ayrıca öğretmenler, SiFU ile ilgili bilgi aktarımında fen bilgisi öğretmenleriyle disiplinler arası işbirliğiyle yapmıştır. Araştırmacı tarafından sağlanan kaynakları meslektaşlarıyla paylaştılar ve öğrencilerin öğrenmesine ön hazırlık olarak derslerinde kullanmalarını istediler.

2b. Öğretmenlerin MGT olarak yapılandırılmış bir VDKV-MG programına katılımı öğrencilerinin SiFU bilgilerini ve fiziksel aktivite düzeylerini nasıl etkiler?

Deney ve kontrol grubu öğrencilerinin ön-test ve son-test SiFU bilgi puanları arasında istatistiksel olarak anlamlı bir fark olup olmadığını araştırmak için karma yöntem ANOVA kullanılmıştır (Tabachnick & Fidell, 2013). Sonuçlar, zaman ve grup arasındaki etkileşim etkisinin anlamlı olduğunu ortaya koymuştur, Pillai's trace = .12, F (1, 256) = 37.59, $p < .05$, $\eta^2 = .12$, orta etki (Cohen, 1988). Deney grubunun ön test ve son test SiFU bilgi puanları toplamının kontrol grubununkinden önemli ölçüde farklı olduğunu göstermiştir. Ön testte birbirine yakın olan grupların SiFU bilgi puan ortalamaları ($M_{Experimental}$ = 24.07, $M_{Control}$ = 24.21) son testte deney grubu lehine farklılaşmıştır ($M_{Experimental}$ = 27.59, $M_{Control}$ = 24.54). Öğretmenlerin VDKV-MG programına katılımının, öğrencilerinin SiFU bilgi düzeyini geliştirmede etkili olduğu sonucuna varılabilir.

Deney ve kontrol grubu öğrencilerinin ön-test ve son-test fiziksel aktivite düzeyleri arasında istatistiksel olarak anlamlı bir fark olup olmadığını incelemek için de karma yöntem ANOVA kullanılmıştır. Sonuçlar, zaman ve grup arasındaki etkileşim

etkisinin anlamlı olduğunu, yani her iki grup için de öğrencilerin fiziksel aktivite düzeylerinde zaman içinde bir değişim olduğunu göstermiştir, Wilks' Lambda = .93, F (1, 163) = 11.65, $p < .05$, $\eta^2 = .07$, orta etki (Cohen, 1988). Sonuç olarak, öğretmenlerin VDKV-MG programına katılımı, öğrencilerinin fiziksel aktivite düzeylerinin gelişimi üzerinde önemli bir etkiye sahip olduğu söylenebilir.

Üçüncü Araştırma Sorusunun Bulguları

Bu araştırma sorusu için nitel veriler, müdahale sonrası yapılan yarı yapılandırılmış görüşmelerden ve 6. hafta MGT video kayıtlarından elde edilmiştir. Araştırma sorusundan VDKV-MG programının değerlendirilmesi teması ve üç kategori (programının tasarımı, uygulanması ve sonuçları) ortaya çıkmıştır.

VDKV-MG programının tasarımı: Görüşme bulgularına göre, öğretmenler mesleki gelişim programının içeriğinden ve planlamasından memnun kalmıştır. Öğretmenler içeriğin tatmin edici olduğunu, birbirini tamamladığını ve genelden özele doğru açıklandığını belirtmişlerdir. Ayrıca, toplantılarda tartışılan konularla ilgili meslektaşlarından öğrendiklerini ve Microsoft Excel eğitimden çok kazanım elde ettiklerini belirtmişlerdir.

VDKV-MG programının uygulanması: Bu kategori içerik paylaşımı, kaynaklar ve sosyal ve fiziksel ortam olmak üzere üç alt kategoriden oluşmaktadır. Öğretmenler, program içeriğinin beden eğitimi alanında uzman bir kolaylaştırıcı tarafından paylaşılmasının etkili olduğunu belirtmişlerdir. Kolaylaştırıcının mesleki bilgisi, deneyimi, zaman ve ortam yönetimi, farklı bakış açıları sunması ve hitabetinin önemli olduğu anlaşılmaktadır.

Kaynaklar: Öğretmenler, kendilerine sağlanan yazılı ve dijital kaynaklar (makaleler, kitaplar, SiFU bilgileri, raporlar, videolar ve sunumlar) hakkında olumlu düşüncelere sahiptir. Kaynakların hem kendileri hem de öğrenciler ve veliler tarafından beğenildiğini belirtmişlerdir. Özellikle yazılı kaynakların bazı kavramların hatırlanmasında ve basitçe anlatılmasında etkili olduğu, ayrıca paylaşılan videoların hem güncel hem de zamanın koşullarına uygun öğretici oldukları ifade edilmiştir.

Öğretmenler uygulama haftalarında bu kaynaklardan öğretim amaçlı yararlanmıştır. Diğer taraftan öğretmenler derslerde kullanabilecekleri daha fazla etkinlik videosu ve alandan uygulama örneklerinin toplantılarda sunulmasını önermişlerdir.

Sosyal ve fiziksel ortam: MGT toplantılarının üniversite ortamında yapılmasının öğretmenlerin mesleki gelişim motivasyonunu arttırdığı anlaşılmaktadır. Bilimsel bir çalışmanın akademik bir ortamda yapılmasının amaca dönük olduğu ifade edilmiştir. Öğretmenler tarafınfan sosyal ortamın kendilerini rahatça ifade edebildikleri, enerji ve sinerjinin yüksek olduğu ve aynı amaç ve hedeflerle bir araya gelmiş meslektaşlardan oluşması konuları vurgulanmıştır

Tartışma ve Sonuç

Veri özellikleri bulgularına göre, beden eğitimi öğretmenleri öğrencilerden sadece SiFU verilerini (boy, kilo, şınav, mekik, esneklik) toplamış ve e-okul sistemine girmişlerdir. Ancak öğretmenler, SiFU testlerindeki sınırlı yetkinlikleri nedeniyle verilerini toplama kalitesi konusunda endişe duymaktadır. Bu doğrultuda, öğretmenlerin beden eğitimi derslerinde kullanabilecekleri geçerli ve güvenilir veri kaynakları elde etmeleri konusunda desteklenmeleri gerekmektedir. Birçok çalışma, öğretmenlerin sahip olduğu verilerin güncel ve doğru olması gerektiğini vurgulamaktadır (Datnow vd., 2007; Schildkamp ve Kuiper, 2010; Wayman vd., 2007; Wohlstetter vd., 2008). Buna ek olarak, araştırmacılar yüksek kaliteli verilere erişimin, kullanıcının ihtiyaçlarına uygun çoklu veri kaynaklarının mevcudiyetinin altını çizmektedir (Coburn & Turner, 2011; Mandinach & Honey, 2008). Öğretmenler, öğretim programında belirtilen sınıf düzeyindeki öğrenci öğrenmeleri için sistematik veri toplama ihtiyaçlarından bahsetmektedir (MEB, 2018).

Kullanıcı özellikleri bulguları açısından, öğretmenlerin veri kullanım bilgi ve becerilerini (analiz etme, yorumlama, raporlama ve görselleştirme) geliştirmeleri gerekmektedir. Öğretmenler, SiFU verilerinin neden ve hangi amaçla toplandığı konusunda daha fazla bilgiye ihtiyaç duymaktadır. Öğretmenler SiFU veri toplama sürecine (ölçme) dahil edilirken, değerlendirme sürecine dahil edilmemektedir. Bu nedenle, SiFU'nun ölçülmesi ve değerlendirilmesi öğretmenler için bir anlam ifade

etmeyebilir. Ayrıca öğretmenler, veri işleme/analiz yöntemleri ya da uygulamaları (örn. Microsoft Excel) kullanarak öğrenci verilerini işlemekte kendilerini yetersiz görmektedir. Öğretmenlerin veri işleme/analiz becerilerinin eksikliği, veri yorumlama kalitelerini ve verileri etkili bir görselleştirme ile raporlama dolayısıyla öğrenciler, veliler, öğretmenler ve yöneticiler gibi diğer paydaşlara sunma becerilerini de olumsuz etkilemektedir (Datnow vd., 2007; İnce vd., 2020; Schildkamp & Kuiper, 2010; Van der Kleij Eggen, 2013).

Okulların örgütsel özelliklerine ilişkin bulgular, okullarda beden eğitimi ve spor dersleri için veri kullanımına ilişkin, e-okul için SiFU veri toplama ve MEB'in gerçekte nadiren yapılan ölçme ve değerlendirme politikaları dışında sınırlı düzenleme veya uygulama olduğunu göstermiştir (MEB, 2018). MEB'in (2018) öğretim süreçlerine yönelik bazı yazılı ölçme ve değerlendirme politikaları olsa da, okulların veri kullanımına ilişkin ortak bir vizyonu ve normları yoktur. Sınıf düzeyinde beden eğitimi müfredatı öğrenci kazanımları için öğretmenler ve yöneticiler arasında iletişim eksikliği vardır. Buna ek olarak, öğretmenlerin raporlarına göre, okullarda veri kullanım desteği sağlayan bir uzman bulunmamakta ve okul yöneticilerinin beden eğitimi derslerinde veri kullanımına ilişkin MEB (2018) ile belirtildiği gibi hesap verebilirlik amacıyla e-okul sistemine girmek için SiFU verilerini toplamak dışında bir beklentisi bulunmamaktadır.

İkinci alt sorunun bulguları, beden eğitimi öğretmenlerinin verileri sistematik olarak SiFU raporlama yükümlülüklerini yerine getirmek için kullandıklarını ve nadiren öğrencilerin öğrenme ihtiyaçlarını belirlemek, ders tasarlamak ve öğrenci gelişimini izlemek gibi öğretimsel amaçlar için kullandıklarını ortaya koymaktadır. Buna ek olarak, veriler öğrenci başarısını, yıllık okul hedeflerini veya öğretmenlerin mesleki gelişim ihtiyaçlarını belirlemek gibi okul gelişim amaçları için kullanılmamaktadır.

İnce ve Hünük (2013) yaptıkları çalışmada, öğretmenlerin beden eğitimi derslerinde SiFU'nun nasıl ölçülüp değerlendirilebileceği konusunda yeterli bilgiye sahip olmadıklarını ortaya koymuştur. Ayrıca çeşitli araştırma sonuçları da beden eğitimi öğretmenlerinin ölçme ve değerlendirme konusunda kendilerini yetersiz bulduklarını göstermektedir (Erdemir, 2007; Özgül ve Kangalgil, 2018; Yilmaz ve Gündüz, 2008).

Bu durum, okul beden eğitiminde bir hesap verebilirlik zafiyeti olduğunu ve öğretmenlerin veri toplama, analiz etme, yorumlama ve raporlama konusunda kendilerini sorumlu hissetmediklerini göstermektedir. Diğer ülkelerde yapılan çalışmalar da beden eğitimi ve sporda ölçme ve değerlendirme uygulamalarının zayıflığına ve hesap verebilirlik önlemlerinin eksikliğine işaret etmektedir (Borghouts vd., 2017; Khasawneh & Al-Khazaleh, 2014).

Genel olarak, ilk araştırma sorusunun bulguları, beden eğitimi öğretmenlerinin veri kullanımının geri planındaki mantığı anlama, veri toplama, verileri analiz etme, verileri yorumlama, etkili görselleştirme ile raporlar oluşturma ve raporları diğer paydaşlarla paylaşma gibi bilgi ve becerilerine yönelik mesleki gelişim programlarının geliştirilmesine acil ihtiyaç olduğunu göstermektedir. Ayrıca, öğrencilerin öğrenme ihtiyaçlarının belirlenmesi, derslerin tasarlanması ve öğrenmenin izlenmesi için öğretimin geliştirilmesine odaklanan bir VDKV-MG programının tasarlanması, okul beden eğitimi öğretim uygulamalarının iyileştirilmesinde daha etkili olabilir.

Araştırma sorusu 2a için iki tema ortaya çıkmıştır: 1) VDKV-MG programı öğretmen öğrenmesi ve 2) Öğretmenlerin VDKV ile ilgili öğretim uygulamaları.

Öğretmenlerin VDKV-MG programından öğrendiklerine ilişkin bulgular, öğretmenlerin öğretim için veri kullanımı farkındalıklarının ve mesleki bilgi ve becerilerinin müdahaleden sonra geliştiğini göstermiştir. Öğretmenler, verilerin öğrencinin öğrenme ihtiyaçlarını belirlemek, öğrencileri tanımak ve onların bireysel ihtiyaçları ve fiziksel aktiviteye katılım motivasyonları konusunda farkındalıklarını artırmak için kullanılabileceğinin farkına varmışlardır. Ayrıca, öğretmenlerin mesleki bilgi ve becerileri eğitimde teknoloji kullanımı, ölçme ve değerlendirme, içerik bilgisi ve müfredatta disiplinler arası bağ kurma konularında gelişmiştir. Öğretmenlerin VDKV ile ilgili öğretim uygulamalarına ilişkin bulgular, öğretmenlerin öğretim uygulamalarını öğrencilerin fiziksel aktivite ve SiFU bilgi verilerine dayalı olarak tasarladıklarını ve çeşitlendirdiklerini göstermiştir. Fiziksel aktiviteyi artırmak için öğretmenler okul içinde ve dışında çeşitli pedagojik stratejiler kullanmışlardır.

MGT olarak tasarlanmış VDKV bileşenleri (veri kullanımını anlama, toplama, analiz etme, yorumlama, raporlama) ve yukarıda belirtilen bulgular göz önüne alındığında, programın tasarım ve uygulamasının öğretmenlerin farkındalık ve bilgilerini geliştirmenin yanı sıra öğrendiklerini beden eğitimi derslerine aktarmada başarılı olduğu söylenebilir. Örneğin, Hunuk ve diğerleri (2013), MGT'nin beden eğitimi öğretmenlerinin SiFU alan ve pedagojik alan bilgisini geliştirmedeki etkililiğini tek bir vakada sunmuştur. Yakın zamanda, İnce vd (2020) geniş ölçekli bir çalışmada öğretmenlerin SiFU ve fiziksel aktivite alan ve pedagojik alan bilgilerini desteklemek için etkili bir MGT yaklaşımı önermişlerdir. Bu çalışma da, veri kullanımı müdahale yaklaşımının, bir MGT'te SiFU ve fiziksel aktivite içeriği ile birleştirildiğinde, hem öğretmenlerin veri okuryazarlığını hem de SiFU ve fiziksel aktivite alan ve pedagojik alan bilgisini geliştirmede etkili olduğunu göstermektedir.

İkinci araştırma sorusunun nicel sonuçları, VDKV-MG programına katılan öğretmenlerin öğrencilerin SiFU bilgilerini ve fiziksel aktivite düzeylerinde artış olduğunu göstermiştir. Bu sonuç VDKV-MG müdahalesinin öğrencilerinin SiFU bilgilerini ve fiziksel aktivite düzeylerini geliştirmede etkili olduğu anlamına gelmektedir. Öğrencilerin SiFU bilgisi ve fiziksel aktivite düzeyindeki gelişim, VDKV-MG programına katılan öğretmenlerin alan bilgilerindeki artışın derse ve öğrenci öğrenmesine yansıması olarak değerlendirilebilir.

Öğretmenlerin daha çok spora özgü becerileri öğretmeye odaklandıkları, ancak beden eğitimi derslerinde öğrencilere yeterli düzeyde SiFU bilgisi aktarmaları gerektiğine dair kanıtlar bulunmaktadır (Arslan vd., 2013; Avşar, 2009; Tekin & Taşgın, 2009; Yılmaz & Gündüz, 2008). Mevcut literatür incelendiğinde, beden eğitimi öğretmenlerinin SiFU bilgi ve becerilerinin yetersizliği nedeniyle bu uygulamaları derslerine etkili bir şekilde yansıtamadıkları görülmektedir (İnce & Hünük, 2013; Santiago vd., 2016; Yılmaz, 2019). Hünük vd. (2013), beden eğitimi öğretmenlerinin SiFU bilgisi arttıkça öğrencilerinin de arttığını bulmuştur.

Daha önce de belirtildiği gibi, VDKV öğrenci verilerinin toplanmasıyla başlayan, ardından öğretmenlerin değerlendirme verilerini analiz etmesi, yorumlaması ve son olarak da verilere dayalı olarak öğretimi uyarlaması gibi çeşitli adımları içerir. Sonuç

olarak, öğretim ile öğrenci ihtiyaçları arasında daha iyi bir uyum sağlanmasının öğrenci öğrenmesini olumlu yönde etkilemesi beklenmektedir (Hoogland vd., 2016; Mandinach, 2012; van Geel vd., 2016). Bu çalışmada, öğretmenlerin öğrencilerin SiFU bilgisi, fiziksel aktivite düzeyi ve belirli ihtiyaçlarına ilişkin verileri toplayıp analiz etmeleri ve ardından derslerini bu ihtiyaçlara göre tasarlamaları, öğrencilerin SiFU bilgisi ve fiziksel aktivite düzeylerini olumlu yönde etkilemiş olabilir.

Eğitimin diğer alanlarında öğrenci başarısı üzerine yapılan VDKM müdahaleleri, ortaokul öğrencilerinin okuduğunu anlama (Lai vd., 2014) ve ilkokul öğrencilerinin matematik becerilerinde iyileşme olduğunu göstermektedir (Andersson & Palm, 2017; Keuning & van Geel, 2016). Bu çalışma VDKV'nin beden eğitimi alanında ilk uygulamasıdır ve bulgular diğer alanlardaki önceki çalışmaları desteklemektedir.

Üçüncü araştırma sorusunun VDKV-MG programı değerlendirme bulgularına göre, öğretmenler mesleki gelişim programının tasarımı, uygulanması ve sonuçlarına ilişkin görüşlerini belirtmişlerdir. Mesleki gelişim programının tasarımı açısından, öğretmenler müdahalenin içeriğinden ve planlamasından memnun kalmışlardır. Mesleki gelişim programının uygulanmasında ise alan uzmanı tarafından MGT'te yapılan içerik paylaşımının etkili olduğu görülmüştür. Mesleki bilgi, deneyim, zaman ve mekân yönetimi, farklı bakış açıları sunma ve hitabet gibi kolaylaştırıcı özelliklerinin önemli olduğu anlaşılmaktadır.

Mesleki gelişim programında öğretmenlere sunulan kaynaklar öğretmenler tarafından beğenilmiş ve öğretim amaçlı kullanılmıştır. Sosyal ve fiziksel ortam açısından, MGT toplantılarının üniversite ortamında gerçekleştirilmesi motivasyonlarını artırmıştır. Mesleki gelişim programı sonucunda öğretmenlerin beden eğitimi ve spor öğretmenliği mesleğine olan inanç ve motivasyonlarının arttığı, mesleki gelişim programının öğretmenlerin beden eğitimi ve spor dersinin amaç ve hedeflerini daha iyi anlamalarını sağladığı, dersin SiFU bileşenlerinin öneminin ve tüm öğrencileri kapsayıcılığının anlaşıldığı, SiFU testlerinin amacının, ölçme ve değerlendirmesinin anlaşıldığı ve öğretmenlerin verileri nasıl kullanacaklarını öğrendikleri görülmüştür.

Öğretmen memnuniyeti ve katılım motivasyonu, mesleki gelişim programlarında başarılı öğrenmenin temel unsurlarıdır (İnce vd., 2020; Ebbeler vd., 2017; Desimone, 2009). Bu araştırma sorusunun bulguları, MGT olarak yapılandırılmış VDKV-MG programının tasarımının ve uygulanma şeklinin katılımcı beden eğitimi öğretmenleri için tatmin edici ve motive edici olduğunu göstermektedir.

Genel olarak, VDKV-MG programının planlamasına dayalı bir ihtiyaç değerlendirmesi, tasarımın arkasında teorik bir çerçeve ile uygulanması ve öğretmenlerin memnuniyetini, öğretmenlerin öğrenmesini, öğrenmeyi sınıfa aktarmalarını ve öğrencilerinin öğrenmelerini kapsamlı bir şekilde denetleyerek programın etkinliğinin değerlendirilmesi mevcut çalışmanın güçlü yönleridir.

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