A STUDY ON INVESTIGATION OF USING A STUDENT CENTERED
INSTRUCTIONAL MODEL FROM PERSPECTIVES OF K-12 TEACHERS
IN A PRIVATE SCHOOL

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

EZGİ DOĞANAY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF EDUCATIONAL SCIENCES

JANUARY 2020

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ABSTRACT

A STUDY ON INVESTIGATION OF USING A STUDENT CENTERED INSTRUCTIONAL MODEL FROM PERSPECTIVES OF K-12 TEACHERS IN A PRIVATE SCHOOL

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January 2020, 132 pages

The purpose of this descriptive study was to explore the perceptions of K-12 teachers' towards using a student-centered instructional model, which is called the 2BM instructional model, in a private school context through employing a cross-sectional survey design. For that purpose, a teacher perception SWOT scale was developed and it measured the strengths, weaknesses, opportunities, and threats of using a 2BM instructional model. The Cronbach Alpha Reliability Coefficient value for the scale was found to be. 92, which is a satisfactory result. The reliability coefficients of the strengths, weakness, opportunities, and threats factors were. 94, .84, .80, and. 76, respectively. The sample of the study included 100 teachers who were teaching at the primary school, secondary school and high school teachers of a private school in Ankara, Çayyolu district.

Independent samples t-Test findings revealed that female teachers have higher perceptions of the opportunities they have when using a student-centered instructional model than male teachers do. T-Test findings also suggested that

teachers who previously used student-centered instructional model have a higher perception of strengths and threats than teachers who did not use a student-centered instructional model before.

One-Way ANOVA test findings reveal that the effect of age, experience, academic degree, faculty, and field of teaching for foreign language teachers indicated that they perceived more threats in adopting student-centered instruction compared to science teachers.

Keywords: Student-centered education, SWOT Analysis, K-12 teachers, private schools

ÖZ

ÖZEL BİR KURUMDA K-12 ÖĞRETMENLERİNİN BAKIŞ AÇISINDAN ÖĞRENCİ MERKEZLİ ÖĞRETİM MODELİ KULLANMAYA YÖNELİK ALGILARIN İNCELENMESİ ÜZERİNE BİR ÇALIŞMA

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Ocak 2020, 132 sayfa

Bu araştırma özel bir okulda çalışan K-12 öğretmenlerinin 2BM adlı öğrenci merkezli öğretim modelini kullanmalarına yönelik algılarını ortaya çıkarmayı amaçlayan betimsel bir çalışmadır. Öğretmenlerin öğretimde kullandıkları öğrenci merkezli öğretim modelinin güçlü ve zayıf yanları, oluşturduğu fırsatları ve uygulamalarını tehdit eden unsurlara yönelik algıları bir SWOT ölçeğine dayanarak açıklanmıştır. Araştırmanın katılımcıları Ankara Çayyolu bölgesinde bir özel okulda görev yapan ilkokul, ortaokul ve lise seviyelerinde çalışan 100 öğretmendir. Araştırmacı tarafından geliştirilen öğretmen algıları SWOT ölçeği kullanılarak katılımcılardan veri toplanmıştır. Hazırlanan ölçeğin Cronbach Alfa Geçerlilik Katsayısı .92 olarak bulunmuştur.

Öğretmenlerin algılarını ortaya çıkarmak için dört çözümlemeli açımlayıcı faktör analizi yapılmıştır. Faktör analizi sonucu öğretmenlerin güçlü, zayıf, fırsat ve tehdit altboyutlarındaki algıları ortaya çıkmıştır. Bu altboyutlara ait geçerlilik katsayılar da sırasıyla .94, .84, .80 ve .76 olarak bulunmuştur.

Bağımsız örneklemler t-Testi'nin sonuçları kadın öğretmenlerin fırsatlara yönelik algılarının erkeklere göre daha yüksek seviyede olduğunu göstermiştir. Yine bağımsız örneklemler t-Testi göre daha önceki deneyimlerinde öğrenci merkezli bir öğretim modeli kullanan öğretmenlerin güçlü yanlara ve tehditlere yönelik algılarının daha fazla olduğunu açıklamıştır.

Tek yönlü varyans analizi (ANOVA) yaş, deneyim, akademik derece, fakülte ve branş gibi değişkenlerin öğretmen algılarına etkisini ortaya çıkarmak için yürütülmüştür. Varyans analizi sonuçlarına göre yabancı dil öğretmenlerinin tehdit altboyutuna yönelik algılarının fen bilimleri öğretmenlerinden anlamlı şekilde farklılaştığı ortaya çıkmıştır.

Anahtar Kelimeler: Öğrenci merkezli eğitim, SWOT Analizi, K-12 öğretmenleri, özel okullar

To my mother Ayla Doğanay,

for her unconditional love and support.

ACKNOWLEDGMENTS

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CHAPTER 1

INTRODUCTION

In this chapter, the background, the purpose, and significance of the study and finally, the definition of key terms of this study are explained.

1.1. Background of the Study

"Education is not preparation for life; education is life itself" is a quote of the famous philosopher and education theorist John Dewey (Dewey, 1916, p.239). This idea is also a summary of the student-centered education approach, which is the focus of this study. John Dewey advocates the need for an educational environment that places the student at the center of teaching, supports the democratic classroom environment, and enables the students to transform their knowledge into experience. Dewey's approach to education is based on progressivism, that is, besides the benefits of education to the individual; it also has duties to free society from ignorance, to eliminate inequality and injustice and to ensure democracy.

Traditional education has begun to be replaced by educational pedagogy that focuses on the needs and characteristics of the individual because traditional teacher-centered education has become inadequate in teaching individuals with 21st-century skills. Freire, (1998) criticized traditional education as being a pedagogy in which students load and memorize knowledge, but do not use it in practice, and hinder the development of skills such as creativity and critical thinking. In the 21st century, universal values have come to the forefront, and student-centered education has started to be used to raise individuals who have these values and are compatible with the global world so it would be challenging for an education system without universal values to realize national ideals (Akınoğlu, 2005).

In the 21st century, the student-centered approach to education has gained much popularity in the world, but some researchers have pointed out that the purpose of adapting this approach to education varies in different countries and regions in the world. For example, according to Windschitl (2002) in the globalizing world and economy, some skills such as problem solving, creativity and cooperation expected from individuals in business life could only be gained through student-centered education. Therefore, student-centered education was widely accepted in western countries. In developing countries, student-centered education has been accepted because it is thought to promote democracy and to support the intellectual development of citizens (Kliebard, 2004). On the other hand, Tabulawa (2003) claims that Western countries are using student-centered education through aid organizations to spread their ideology and ideas to African countries. In other words, Tabulawa argues that these organizations aim to use student-centered education as an ideological tool rather than an educational pedagogy. Finally, Gillia (2016) states that there are cognitive, psychological, economic and political reasons for choosing a student-centered approach to education. It develops students' higher-order thinking skills; it provides human capital development and supports democracy in the classroom. The work of student-centered educational practices in Turkey is close to Gillia's opinion. The constructivist curricula that started to be implemented in the 2004-2005 academic year emphasized the skills which are critical thinking, creative thinking, communication, problem-solving, research, decision making, using information technologies, entrepreneurship and personal and social values (ERI, 2005). So, the curriculum should train individuals with the cognitive and social skills necessary for social and business life.

Various instructional models have been designed for the planning and implementation of student-centered education in the learning and teaching process to realize student centered education,. One of the best known of these instructional models was that The 5E Instructional Model of Biological Sciences Curriculum Study. 5E Instructional Model is a student-centered and constructivist instructional model designed by Robert Bybee in the late 80s for use in science education. Bybee

(1997) agreed on the idea that learning is an active process that occurs within the student and is directly affected by the student's mental schemas. Therefore, according to him, learning occurs as a result of the student's cognitive processing of knowledge based on his conceptual perceptions and personal knowledge. The 5E model consists of five main steps: engagement, exploration, explanation, elaboration and evaluation, and the model aims to design instruction using the learning activities appropriate to these steps respectively. In this model, the teacher organizes units, subjects and lessons in accordance with the steps of the instructional model.

Many studies have been conducted to investigate the effectiveness of the 5E instructional model around the world, and these studies have shown that the model is more effective than alternative approaches to help students learn subjects. One of them is Coulson (2002), which aims to investigate the effect of teachers' fidelity to instructional model on the development of students. In his research, he used selective response tests to be applied before and after the application. As a result of the research, it was found out that there were more learning outcomes in the classrooms of teachers who had high and medium fidelity to the 5E instructional model than the classes of teachers who did not use the model or who used it at a low level. Coulson, Van Scotter and Taylor (2007) published two studies to investigate the effect of 5E instructional model application fidelity on learning. The first study was conducted with four teachers in a high school that included the 5E model in their programs. In the study, teachers' fidelity to the model was observed and a 20-item test was applied to the students to test their learning outcomes. The result showed that the classrooms of the teachers who adhered to the model were more successful. In the second study, 326 9th grade students and 15 teachers were included in the study and an observation protocol adapted from Horizon Research Inc., Classroom Observation Protocol (HRI, 2000) was used to testing teachers' fidelity to the model. In both studies, it was revealed that the teachers who determined the strategies appropriate to the 5E instructional model and remained fidelity to the implementation of the learning steps had better learning outcomes. As a result, it was revealed that following the steps of the 5E instructional model and enriching teaching with student-centered activities

developed students' 21st-century skills such as communication skills, social skills, problem-solving, adaptability, self-management, self-development.

The 5E instructional model has become a preferred model for teachers and educators due to its positive effects on the teaching and learning process. The 2BM instructional model discussed in this study was also designed by considering the theoretical framework of the 5E Instructional Model because of its benefits.

Curriculum specialists developed the 2BM Instructional Model in a private school in Ankara. This instructional model has similar features with the 5E Instructional Model and is based on the constructivist approach as a theoretical background. Similar to the 5E Model, the 2BM Model allows teaching to be performed by following specific learning steps. These steps allow students to explore information, explain what they have learned, integrate knowledge into daily life, deepen and transfer knowledge to different disciplines and problems. At the end of the learning process, the student produces an observable and measurable learning output and product.

As well as developing student-centered instructional models, it is essential to investigate their implementation processes, in this way, problems in the application process can be identified, and teacher-student attitudes and perceptions can be revealed. In order to look at the subject at a broader scale, first of all, it is necessary to examine the studies on student-centered educational practices in our country. After student-centered education officially took part in the national curriculum in 2004-2005 academic year, educational researchers examined some issues like that how student-centered instruction is implemented in the Turkish context, what are the teachers and the students' perceptions and attitudes about it and what are the obstacles that make student-centered education challenging to apply. Some of the researches showed that student-centered instruction improved students' learning outcomes, enabled active learning, increased students' motivation, and improved their scientific process skills (Anıl & Batdı, 2015; Çeliksoy, 2017; Çoruhlu, 2013; İlter & Ünal, 2014; Omotayo & Adeleke, 2017; Özdemir & Balkan, 2017; Paliç,

Şadoğlu & Akdeniz, 2015; Polat & Baş, 2012; Salman, 2006; Sevinç, 2008; Sezen, Konur & Çimer, 2018). Besides, it was found that teachers generally had positive attitudes toward student-centered teaching. On the other hand, negative findings are claiming that the infrastructures and learning materials of the schools are not suitable for student-centered education, the readiness of students and teachers for student-centered education is insufficient, and the examination system is an obstacle for student-centered education (Sezen, Konur & Çimer, 2018 ; Kalender, 2006; Salman, 2006; Paliç, Şadoğlu & Akdeniz, 2015).

Student-centered education and instructional activities are generally researched within the scope of public schools and higher education institutions. What makes this study different is that it was prepared within the scope of a private educational institution and applied to private school teachers. In contrast with public schools, private schools provide learning environments which are supported by technology and rich learning materials, and they have accessible labs, workshops, and small class size. Therefore, there may be differentiation in the thoughts and perceptions of teachers about student-centered education. Since teachers are the leading practitioners of student-centered education, revealing teachers' perceptions of using the student-centered instructional model will play an essential role in identifying and eliminating the shortcomings in practice.

The need for student-centered teaching is expected to increase in the coming years and the use of student-centered teaching models is expected to become widespread. As the characteristics of learners continue to change rapidly in the 21st century, the education given in the schools will be designed to develop students in a multi-faceted way. Students should reach new competencies by blending the knowledge, skills, attitudes and values they have learned: Creating new values, taking responsibility and reconciling tensions and dilemmas (OECD, 2018). The skills that the OECD expects and underlines to be developed can be made possible through student centered learning environments and instructional models. Teachers have the most crucial role in creating student centered environments and using instructional models. Therefore, it is essential to determine teachers' perceptions of using a student

centered instructional model. Ministry of National Education (2019) published the 2023 Education Vision Report. According to the report, studies will be carried out to improve the quality of education of private educational institutions. In these institutions, instead of merely preparing students for exams, they will adopt an educational approach that will equip students with the knowledge and skills to prepare them for life.

Considering the future goals of national education policy and the learner profile needed by the global world; it can be foreseen that the importance and need of student-centered instructional models will increase. This study will reveal the perceptions of teachers about an instructional model developed and used in a private school thus, it will provide the infrastructure and source for many future studies.

1.2. Purpose of the study

This study aims to examine the perceptions of K-12 teachers who are working in a private school about using a student-centered instructional model in their lesson. Based on these teacher perceptions, the student-centered instructional model will be analyzed in terms of its strengths, weaknesses, opportunities, and threats to the implementation.

This study attempts to answer the following research questions:

This study is designed to answer the following research questions to reach the desired purposes:

1. What are the perceptions of teachers towards using the 2BM student centered instructional model?

1.1. What are the perceptions of teachers about the strengths of using a 2BM instructional model?

1.2. What are the perceptions of teachers about the weakness of using a 2BM instructional model?

1.3. What are the perceptions of teachers about the opportunities they have in the process of using a 2BM instructional model?

1.4. What are the perceptions of teachers about the threats they have in the process of using a 2BM instructional model?

2. Do teachers' perceptions of using 2BM student-centered instructional model (2BM) change according to the following characteristics regarding its strengths, weaknesses, opportunities and threats:

2.1. Do teachers' perceptions of using 2BM change according to gender?

2.2. Do teachers' perceptions of using 2BM change according to age?

2.3. Do teachers' perceptions of using 2BM change according to years of experience?

2.4. Do teachers' perceptions of using 2BM change according to the graduation program?

2.5. Do teachers' perceptions of using 2BM change according to the highest degree received?

2.6. Do teachers' perceptions of 2BM change according to the field of teaching?

2.7. Do teachers' perceptions of using 2BM change according to the student centered instructional model using status?

1.3. Significance of the Study

In the 2004-2005 academic years, the Ministry of National Education introduced a new curriculum that was designed by considering student-centered education principles and constructivist approach. The Education Reform Initiative (2005) in its Curriculum Review and Evaluation Report stated that there is an innovative perspective in the programs in general which puts the student in the center of

education and proposes different methods than traditional methods. The report also stressed the importance of highlighting individual differences in newly published programs. According to the same report, the innovations brought by the new curriculum are listed as follows (ERI, 2005, p.4):

1. In the new curricula, the thematic approach was generally taken into consideration in the organization of contents and learning areas were determined within this framework.
2. In the previous programs, "purpose", "target," and "target behaviors were mentioned and in the new program this terminology was abandoned and instead, the term objective has been used.
3. The new curriculum focus on skills such as critical thinking, creative thinking, communication, problem-solving, research, decision making, using information technologies, entrepreneurship, personal and social values are emphasized in each area.
4. Learning and teaching processes and the role of the teacher are discussed in more detail in the new programs compared to the previous programs.
5. The new programs encourage the use of instructional materials anymore in the teaching and learning process and give more concrete examples of material use.
6. In the new programs, assessment and evaluation are addressed not only to evaluate the learning outcome but also to the learning process.

After the introduction of the student-centered and constructivist curriculum in Turkey, the use of student-centered instructional models became widespread among teachers. For example, various researches were conducted to investigate the effectiveness of the 5E instructional model in many lessons, especially science courses. By considering the characteristics of the new curriculum listed above, it can be said that there is a need to use a student-centered instructional model. This study is expected to contribute to the literature by investigating the use of a student-

centered instructional model in the private school that runs the curriculum of the Ministry of National Education.

Even though the content of the curriculum has been changed in the following years, the emphasis has always been on student-centered education and constructivism. Status of student-centered education in Turkey, methods of its application, the perception toward student-centered pedagogy were the research topic for many education studies, but these studies have been limited to state schools and higher education institutions (Ahmed, 2013; Akcan, 2018; Altinyelken, 2011; Erdem, 2018; Kalender, 2006; Korkut, 2006; Mancır, 2014; Saydam, 2009; Sevinç, 2008). Those studies on student-centered education indicated that the general attitude towards student-centered education was positive and that student-centered education and the 5E instructional model had positive effects on students' achievement. On the other hand, it was stated that there are problems in practice due to the lack of infrastructure in schools, lack of materials, crowded classes and lack of knowledge and experience of teachers about student-centered education.

The researches also revealed that teachers experienced classroom management problems in student-centered education, that students' readiness was not sufficient for learning with student-centered learning methods, and that the time allocated for exam preparation prevented the implementation of student-centered education (Sezen, Konur & Çimer, 2018; Kalender, 2006; Salman, 2006; Bozdoğan & Altunçekiç, 2007; Paliç, Şadoğlu &Akdeniz, 2015).

This study was applied in a private school that has convenience in physical infrastructure and teaching materials, labs, and workshops for all kinds of scientific studies, advanced technological facilities and small class sizes. Therefore, the results of the study are expected to differ from the studies conducted in public schools. This study is also essential as a starting point for evaluating the situation of student-centered education in private schools.

In Turkey, the share of private schools in education has been increasing steadily in the last ten years. In-state policies, efforts are being made to expand the number of

private schools and increase the number of students attending those schools. According to national education statistics of the Ministry of National Education (2018); the proportion of private schools in Turkey has risen to 14.7%, and the proportion of students attending private schools has risen to 8.3%. Figure 1.1 reveals the proportion of private schools in Turkey.
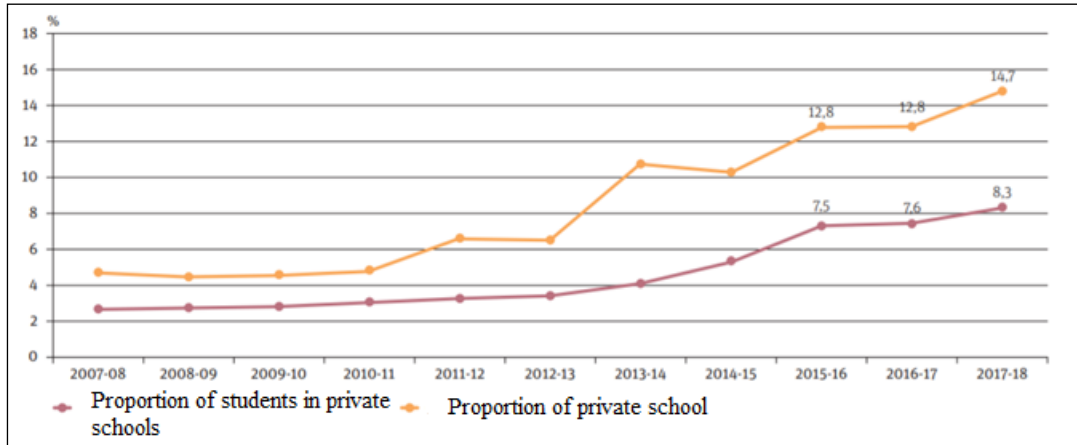
Figure 1.1. *Private Schools in Educational System (%) Source:* http://sgb.meb.gov.tr/www/resmi-istatistikler/icerik/64

When the number of students attending private schools according to school types is examined, it is clear that the ratio of students increases in all school types. Figure 1.2 indicates the proportion of students attending private schools.
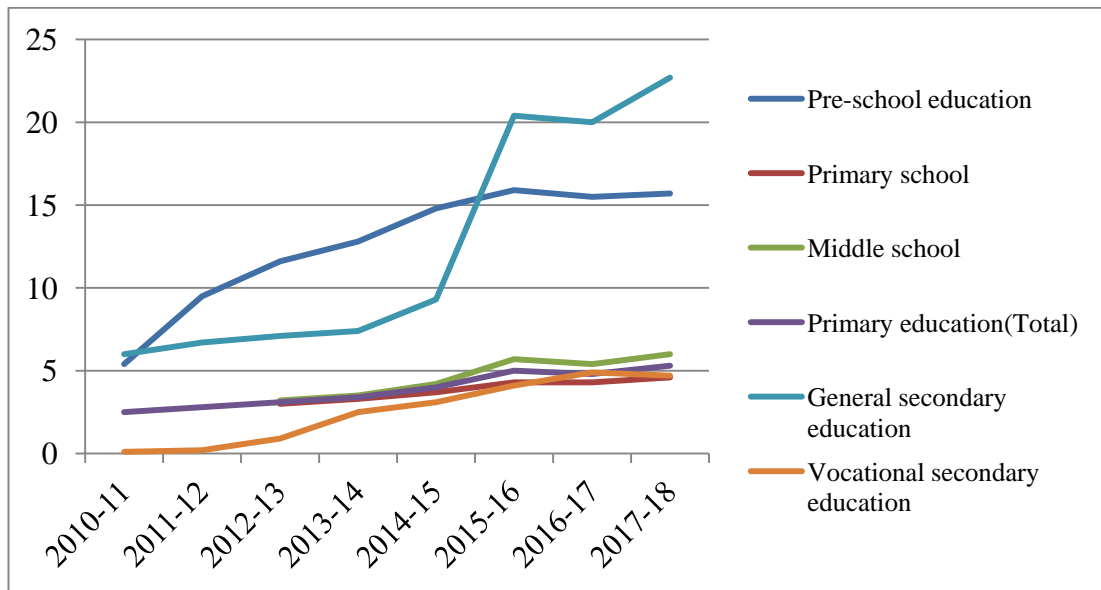
Figure 1.2 *Proportions of Students Attending Private Schools (%) Source:*
http://sgb.meb.gov.tr/www/resmi-istatistikler/icerik/64

Figure 1.3 shows the proportion of transition to higher education by graduated school
type.
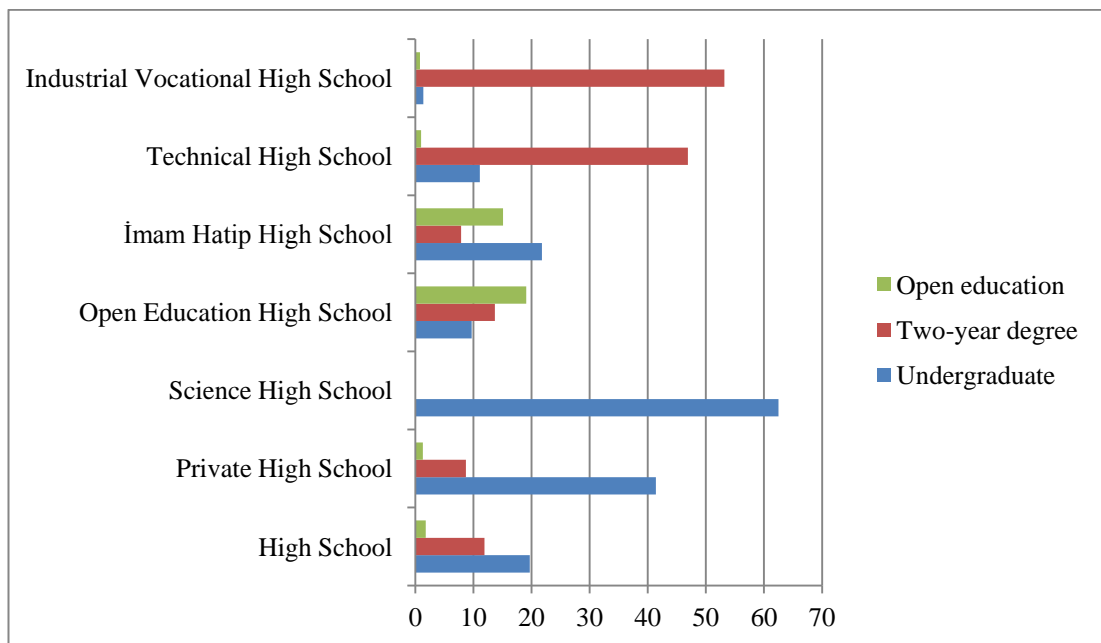
Figure 1.3 *Transition to Higher Education by Graduated School Type (%) Source:*
http://sgb.meb.gov.tr/www/resmi-istatistikler/icerik/64

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Private schools are increasing the number of students by promising to prepare students for exams, which are the reality of our country, as well as providing student-centered, technology-equipped, high-level education. The schools which are rooted and well-known design their instructional model to plan and implement the teaching and learning process in a way that allows students to develop their cognitive, affective, and psychomotor skills. Although student-centered education is very much on the agenda of private schools, no studies are investigating its effectiveness and implementation status in private schools. The experiences of the teachers working in private schools towards the student-centered instructional model are important in order to broaden the perspectives about perception and implementation of student-centered education in our country. Therefore, this study was carried out in a private school which actively uses the student-centered instructional model at all levels.

The teacher-centered and rote learning approach was also criticized in the 2023 education vision report published by the Ministry of National Education. In the report, it was stated that each child had a hidden ore that should be discovered by the teachers so the teacher should explore the differences of children and allow them to present their particularities and differences, instead of forcing them to behave normative patterns of adults by uploading information to them.

Student-centered education will continue to be up-to-date in the coming years and will be presented with programs aimed at educating and evaluating the individual in a multidimensional way. Investigating private school teachers' perceptions of using a student-centered instructional model in a private school will be necessary for coming years, as the Ministry of National Education has stated in its 2023 education vision; that it will be useful to improve private education institutions more and change negative perceptions of people towards private schools. In the educational vision report, National Ministry of Education (2019, p.120) explained the opinions on private schools as:

> "Quality-oriented development of private education, which has gained momentum in recent years, moves away from an exam-centered perspective. The spread of private education with only a quantitative target disrupts the quality-quantity balance and

adversely affects the way that the society perceives private education, and this perception can lead to harm to students, teachers, and parents. The area of private education, which undertakes a serious burden in the education system, will evolve into a more flexible and purposeful structure within the system in the next three years. Private education, which develops international standards, will assume a supporting and developing function for all schools."

This study aimed to reveal perceptions of teachers about using a student-centered instructional model in a private school in Turkey is separated from other researches so. In addition, the 2BM model mentioned in this study is an instructional model that has not been previously published in the literature and is applied only within a private school. This study may draw attention to the fact that different instructional models can be designed similar to the 5E instructional model or another student centered instructional models and may inspire other schools and educators on how student-centered education can be conducted in practice.

1.4. Definition of Terms

The key terms of this study are explained in the following paragraphs in alphabetical order.

Instructional Model: "Instructional model is a guideline which the teachers use to plan the teaching and learning process. Instructional models depend on learning theories that describe the learning ways of individuals.

K-12 Teachers: K-12 refers to twelve-year compulsory education before university. In this way, K12 teachers work in kindergarten, primary, and secondary schools. This study does not include kindergarten teachers.

Perception: Perception refers to the acquisition, interpretation, selection, and regulation of sensory information in psychology and cognitive sciences. Perception consists of signals in the nervous system, which are formed by the physical stimulation of the sensory organs (Schacter, Gilbert, & Wegner, 2011).

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Student-Centered Education: Student-centered education is to organize the education in a way to ensure the participation of the students at every stage of teaching and learning process by taking into account the individual characteristics in order to educate individuals who have scientific thinking and communication skills, learn to learn, adopt universal values, use technology well and have realized themselves (Erdem, 2018). The next chapter will provide different definitions of student-centered education.

2BM Instructional Model: 2BM is a constructivist instructional model which is designed by curriculum specialists of a private school for teachers to use when planning their lessons.

SWOT Analysis: SWOT Analysis is named using the initials of the words' strengths, weaknesses, opportunities, threats. SWOT Analysis is a strategic technique used to identify the strengths and weaknesses of the organization, technique, process, situation, or person in a project or commercial enterprise and to identify opportunities and threats arising from internal and external environments (Aksu, 2002).

CHAPTER 2

LITERATURE REVIEW

This chapter introduces the related literature within the framework of student centered education. Firstly, the historical, philosophical and psychological background of student-centered education are explained. Then the 5E instructional model and a 2BM instructional model that is a subject of the research were presented. Finally, related studies with student centered education are explained.

2.1. Student-Centered Education

2.1.1. History of Student-Centered Education

Student centered education focuses on student's experiences, so experiential education is related to student centered education in terms of depending on student's experiences and 'learning by doing.' The English philosopher John Locke worked on experience-based education. According to John Locke's theory, known as a tabula rasa or blank slate, the individual is born with an empty mind that is only filled with experience and reflection of these experiences. John Locke's experience-based learning philosophy forms the basis of the concept of experiential education (Henson, 2003).

Swiss philosopher Jean Jacques Rousseau (1712-1778) was one of the other prominent figures in the history of student-centered education. He was also the first educator to introduce the student-centered concept. During his lifetime, he felt uncomfortable that children in his country were treated as young adults, and he thought that this would harm children's development. For this reason, he preferred to raise his child by freeing himself from the corrupt society and by gaining experience in nature. In his book -Emile- he described this form of education as experience-

based education. According to him, education should be student-centered and experience-based. Teachers should use their time to explore students' differences rather than uploading them direct information (Gillia, 2016).

Similarly, Johan Pestalozzi (1746-1827) was influenced by Rousseau's work, and he opened a school in Switzerland with a student-centered curriculum. Pestalozzi believes that students should be educated physically, mentally, and emotionally as a whole. According to his metaphor, the school should be like a home, and a teacher should be like a good parent (Henson, 2003).

Another example is Colonel Francis Parker (1837-1902). He was an American soldier and teacher, and he was uncomfortable with the rote-based education system at that time. He was influenced by student-centered education in Europe and went to Berlin to study student-centered education and when he returned to the United States, he worked to explain the student-centered techniques he learned to the teachers (Henson, 2003). Parker aimed to replace rote-based education with inquiring learning. He introduces the "Quincy System" implemented in schools in Boston as a system in which students are seen as individuals rather than machines (Parker, 1901).

Psychologist John Dewey (1859-1952) on the other hand, was one of the most important figures in student-centered education. Unlike Rousseau, he argues that the individual should not be protected from society and should be raised as a part of social life (Henson, 2003). For the first time at the University of Chicago, he established a laboratory school that had a curriculum in which problem-solving activities. This school was also a place where a cooperative, school-based social organization was emphasized (Korkut, 2006). According to Dewey's understanding of education, education should be based on problem-solving and daily experiences, and each student's experiences and problem-solving approach should be evaluated individually (Dewey, 1938). Another concept that Dewey put forward was collateral learning or confluent learning. Confluent learning argues that the best learning environments should address emotions because students' attitudes, tastes, and variations affect cognitive learning (Dewey, 1938).

Regarding, Piaget (1896-1980) and Vygotsky (1896-1934) were prominent representatives of the student-centered education concept who followed Dewey's arguments (Koç & Demirel, 2004). There were differences in their approaches, although the two names argued that education should be constructivist. Piaget emphasizes the importance of the individual in education and emphasized the individual's mind. According to him, children form information through their actions and discoveries in the world. On the other hand, Vygotsky argues that interpersonal relationships are the most critical element of learning. Understanding is a social phenomenon and cannot be separated from the social environment where the individual lives (Koç & Demirel, 2004). The consensus of Piaget and Vygotsky was that they emphasized the importance of language development and its significance in thinking and learning.

2.1.2 The Philosophical Background of Student-Centered Education

From the past to present, there have been several philosophical approaches on which all educational systems and learning models have been based on. The objectives, contents, methods, and techniques of the curriculum are shaped according to the philosophy they adopt. Philosophy shapes the decisions and actions of education. If there is a lack of philosophy in education, the teacher is undefended to impose prescriptions and interventions of others and different approaches. Thus, as a result of the application of basic philosophical approaches in educational sciences, the concept of educational philosophy has emerged (Ornstein & Hunkins, 2009).

Major philosophies are idealism, realism, pragmatism, and existentialism. While idealism and realism are conservative philosophies, pragmatism and existentialism are counted as liberal philosophies that give freedom to individuals. Educational philosophies are also in line with those significant philosophies. Perennialism and essentialism are traditional, teacher and subject-centered educational philosophies and they are a reflection of idealism and realism. However, progressivism and reconstructionism are student-centered philosophies which assert libertarian and democratic education (Ornstein and Hunkins, 2009).

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Pragmatism is the underlying philosophy of student-centered education. Progressivism and reconstructionism are also educational philosophies which student-centered education is based on.

2.1.2.1. Progressivism

Progressivism is an educational implementation of pragmatist philosophy, which suggests change is the essence of reality, so education should be in a constant change. The basic of education is the continuous reconstruction of experience. Thus, past experiences help to guide future behaviors in a much better and more accurate way. (Dewey, 1938) Marietta Johnson (1864-1938) was one of the advocates of student-centered progressive education and she argues that prolonging childhood is especially needed in a technological society and childhood must be lengthened rather than shortened. Education should support children's developmental stages and stop enforcing them to behave like an adult. Johnson believes that activity-based curriculum is necessary for progressivist education because students learn better when they actively participate in problem-solving and exploration activities. They can reconstruct their knowledge thanks to direct experiences. In this way, an activity-based curriculum includes different learning domains that are physical, cognitive, and affective.

William Heard Kilpatrick (1871-1965), a professor of education at Columbia University's Teachers College, believes a project method is essential for progressivist education. He followed three guiding principles to restructuring Dewey's problems solving in the project method (Killpatrick, 1918):

- The student should collaboratively study to formulate and test hypothesis
- The teacher should guide the students without dominating them.
- Education should involve problem-solving.

According to McNichols (1935), the main principles of progressivism covered are:

- Education should be active and based on the interests of the child.

- The problem-solving method should be taken as a basis in teaching.

- School should be life itself rather than preparation for life.

- The task of the teacher is to guide the students, not to manage them.

- The school should encourage and direct students to cooperate rather than to compete.

- The educational environment should be democratic.

2.1.3 Psychological Background of Student-Centered Education

Psychology is related to the question of how people learn, and it provides a foundation to understand the teaching and learning processes. Curriculum scholars or practitioners agree on the significance of the psychological foundation of education. Their consensus is that teaching and learning are interrelated, and the psychology discipline combines this relationship. The psychological inquiry clarifies theories and principles of learning that affects teacher and student behaviors during teaching and learning processes. In short, psychology is the consolidated element of the learning process that provides the basis for the methods, materials, and activities of learning (Ornstein & Hunkins, 1998).

The major learning theories have been classified into three groups. (1) Behaviorism which deals with various aspects of stimulus-response and reinforcers; (2) Cognitive theories which view the learner's cognitive development as a determinative factor of learning with relationship to the total environment; and (3) Phenomenological and humanistic theories which consider the whole child in terms of social, psychological and cognitive development.

In this part, cognitive development theory and constructivism are explained in detail because they are the base of the instructional model which is the subject of this research.

2.1.3.1. Cognitive Development:

Jean Piaget was the pioneer of the cognitive theory, which is a part of developmental psychology. He opposed to the arguments of empiricists who argue that knowledge is a total experience of an individual and nativists who believe that organisms are born with natural thoughts basing the knowledge. He developed a new argument that created harmony between these two opposite and sharp approaches. He called his new theory as interactionism because he thought cognition was an interaction between heredity and environment. Piaget also named his theory as constructivism because he believed that acquiring information was a continuous self-structuring process (Driscoll, 2005).

Piaget describes cognitive development in terms of stages from birth to maturity as; (1) Sensorimotor stage (ages 0-2); (2) Preoperational stage (ages 2-7); (3) Concrete operations stage (ages 7-11); (4) Formal operations stage (age 11 onward). Individuals have different cognitive features and behaviors in each stage, so the teacher should consider these developmental stages while constructing teaching and learning activities (Piaget, J. & Cook, M. T. ,1952).

Piaget also argues that environmental experiences are significant for cognitive development. He defines three basic cognitive processes to form the basis of the environmental and experiential theories. *(1)Assimilation* is the integration of new knowledge into existing experience in coordination with the environment. *(2) Accommodation* in which children modify and adapt cognitive structures in a new environment. *(3) Equilibration* occurs when a child tries to achieve a balance between previously understood knowledge or phenomena and already understood. It is an equalization process of assimilation and accommodation of the learner's environment (Ornstein and Hunkins, 2009).

2.1.3.2. Constructivism

The most familiar cognitive learning theory is probably constructivism (Bishop et al., 2003). In the traditional education approach, learning takes place through the direct

receiving of information transferred by areteacher to students. This information is considered to be scientific and immutable, and it is already available worldwide. Nature should directly be taught to students, and it is assumed that all students can learn the information in the same way. The responsibility of the teacher is to transfer the information directly to the students through methods such as lecturing, asking questions, and giving answers (Brooks and Brooks, 2001).

Contrary to this traditional approach, the constructivist approach proposed by Piaget (1977) and Vygotsky (1986) describes a learning environment in which students participate in active discovery activities and the teacher guides the students only when they need it. According to Piaget, knowledge is not a phenomenon that can exist independently and coexist with the experimental world of the individual (Duncan and Buskirk-Cohen, 2011).

On the other hand, according to Henson (2003), constructivism is an educational theory advocating that students should form their understanding by adding new information to their existing experiences in the learning process.

Constructivists argue that everybody's method of understanding information is different. People may encounter new experiences, objects, ideas, or relationships that are not meaningful to them. In this case, they try to make sense of new information based on their previous knowledge or experience to create new rules and this process of meaning and signification is different for everyone (Brooks and Brooks, 2001). Similarly, constructivists claim that information is subjective, not objective. The knowledge that each subject, i.e., the individual, relates to his/her previous experiences will be specific to that individual (Proulx, 2006).

The constructivist approach emphasizes that students' internal motivation is an essential factor in the process of acquiring new knowledge and skills. According to constructivists, students do not have to be masters of a subject; instead, they can be motivated to explore it, to deal with it, to associate it with their experiences, and to challenge it (Sharkey and Weimer, 2003).

Brooks and Brooks (2001) state that the constructivist paradigm has some characteristics:

- Constructivist education allows students to focus on their ideas from a broad perspective rather than memorizing fact-driven curriculum.
- Constructivist education provides an opportunity for learners to share their interest, to make connections with their opinion, and to express original opinions.
- The teacher promotes the idea that 'the world is a complicated place, but we have multiple realities, and truth can only be an interpretation of the individual.'

Brooks and Brooks (1999) emphasize five guiding principles of constructivism:

1. Posing Problems of Emerging Relevance to Students:

Posing problems of emerging relevance to students is an essential principle of constructivism. Students sometimes feel not-prepared for the lesson, they do not show interest to the school, and learning or content may not be attractive for them. Namely, they can seem irrelevant and unmotivated. In such a situation, teacher mediation and guidance are necessary to help students to construct their understanding of the lesson. To help students, the teacher can start by providing a unique problem-solving situation.

2. Structuring Learning around Primary Concepts: The Quest for Essence

Structuring learning around primary concepts provides a clear organization for learning in constructivist pedagogy. Teachers can gather problems around their conceptual clusters to organize information because students are most often involved when problems and ideas are presented as a whole rather than separate presentation. (Brooks, 1993). In traditional learning, content is separated into parts, and student focuses on memorizable small parts rather than seeing the whole picture. As a result, the student has difficulty in different compound pieces of information. Rather than

giving parts of information directly, constructivist pedagogy advocates that students should have a chance to select their problem-solving approaches. Students can reflect their opinions, analyze, compare, and contrast the provided information.

3. Seeking and Valuing Students' Points of View

Seeking and valuing students' points of view are crucial for constructivist education. Students' points of view provide us an idea about how we can develop the lesson better and prepare meaningful instruction and practices for students. If a teacher does not become aware of students' points of view, teaching may include irrelevant experiences, and it may be annoying for students. Hunt (1961) states that if an educational system has only universal goals and a limited variety of educational approaches, it results in failure for many students because they can not fit within the system. From this point of view, acknowledging relativity gains importance. Relativity means understanding another person's point of view. There may be great of other facts and multiple perspectives.

4. Adapting Curriculum to Address Students' Suppositions

Constructivism advocates that the curriculum's cognitive demands should match with students' cognitive abilities because learning occurs when the curriculum supports learners' social, cognitive, and emotional demands (Brooks & Brooks, 1999). Therefore, teachers should adopt the curriculum according to learners' suppositions. Piaget provided a pioneering work for addressing suppositions and explained the developmental stages of an individual. Developmental stages partially illuminate the children's mental structures and perceptions of the world.

On the other hand, the stage approach is not adequate to explain the relationship between teaching and learning because, in the same stage, there may be different cognitive structures and intelligence.

5. Assessing Student Learning in the Context of Teaching

Teachers already assess their students' learning when they asked a question sometimes by nodding or giving verbal clues leading to the expected answer or response. Examples can be given as "Close, but not quite" or "Yes, that is correct!" However, these behaviors of teachers may convey students to the feeling that there is always only one correct answer to each question and raising hand before being sure of figuring out the correct answer brings some risk together. The teacher generally prefers giving the response "No," which interferes with students' thinking process. Preferring nonjudgmental feedback is more appropriate in facilitating learning.

Likewise, teachers need to forge a cognitive link with their students. Therefore, instead of giving students a 'measuring' task to see if they will fail or pass, it is suggested that teachers should give students an 'observing' task to see how much and what kind of help they need to complete successfully. When evaluating student's development, instead of using only tests and exams, it is necessary to observe their patterns of communication in the classroom and to consider their ideas that contribute to the lesson (Brooks and Brooks, 1999).

There are three different approaches to constructivism: cognitive constructivism, social constructivism, and radical constructivism.

Cognitive Constructivism

According to the cognitive constructivism theory that Piaget asserted, learning depends on the mental development of the individuals, and as a result of mental activities, the information is structured in mind. So, Piaget encouraged his students to manipulate concrete objects by giving them problems and he realized that each learner makes different inferences, right or wrong, on the objects and he concluded that individual inferences are more critical in the learning process (Piaget,1936).

Social Constructivism

Vygotsky, like Piaget, mentions the structuring of knowledge, but the emphasis is not on innate mental, instead it is about the effects of social environment and interaction on mental processes (Okurkan, 2010).

Lew Vygotsky observed that children were more successful when they worked in small groups and shared their ideas during problem-solving activities. He called this social learning approach, "negotiating learning"(Vygotsky, 1978). The system used by Vygotsky to promote communication for the group is now known as cooperative learning (Henson, 2003).

Radical Constructivism

Ernst Von Glasersfeld is the most important representative of radical constructivism. He discussed the existence or absence of objective reality and argued that the only truth was a subjective reality (Glasersfeld, 1998).

Radical constructivism emphasizes the view that the individual actively creates information. This aspect is similar to cognitive constructivism. However, it has gone further than cognitive constructivism and has defined the individual as the only factor in the structuring process

2.1.4. Definitions of Student-Centered Education

Student-centered education is a prevalent and widely investigated issue of educational researchers for decades. Since the idea of learner-centered pedagogy had appeared in the early 1900s, it had been prospered with different definitions and pedagogical approaches, which were mentioned soon in this paper.

One of the common points of those definitions was that the student should actively participate in the learning process by exploring and doing. They should be responsible for their own learning rather than listening to lectures only. Teachers and students are equal stakeholders in the center of learning. Teacher gives responsibility to students for their learning (Prawat, 1992).

Another point was that "learning to learn" is a goal of student-centered pedagogy-which means each student, has individual differences; therefore, each student's learning style, pace, difficulty, and intelligence is different. In this case, each student should choose how to learn and how to access knowledge. They should explore how

to learn better. According to Vural and Demir (2005), student-centered education aims to reveal different student profiles and to teach students how to learn in the best way.

McCombs and Whisler (1997) have defined student-centered pedagogy as a combination of knowledge of learner's characteristics (their heredity, experiences, perspectives, backgrounds, talents, interests, capabilities and needs) and knowledge of learning.

Student-centered education is enriched with different activities that need active student participation. Felder and Brent (1996) state that assigning open-ended problems and problems requiring critical thinking and creativity, involving students in simulations and role-plays, assigning unusual writing practice and using individualistic or/and cooperative learning increase student participation.

Burnard (1999), on the other hand, defines student-centered classroom as an environment where students can choose what to study, how to study, and why to study the topic to be learned.

Hoidn (2017, p.88), elucidates the design principles of student-centered environments:

1. The curriculum should be designed to develop deep conceptual understanding and reflective practices.
2. The curriculum should be revised as a result of student feedback and assessment activities.
3. Learning activities should be customized according to learners' prior knowledge and experience. Students' active participation should be provided by considering their interests, and they must be allowed to show their different understandings.
4. A supportive community of learners should be created, and they should be encouraged to work in collaboration. A supportive learning environment promotes norms of behavior, joint exploration, and reflective practices.

5. The learning process should be assessed step by step, and customized feedback should be provided for each of the students. Assessment criteria should be determined by negotiation with students. Self and peer evaluation skills should be gained.

6. Teachers should be trained to adopt a flexible and cooperative learning environment. The teacher-student relationship is an important issue of student-centered education. They should be constructed individual or group learning situations to stimulate further thoughts.

Individuals who explore their learning style and develop self-learning ability can sustain adventure to learn something new throughout their lives. According to Nonkukhetkhong, B. Baldauf Jr, and Moni (2006), the learner-centered approach includes lifelong learning. Student-centered pedagogy brings students the ability of reasoning, creativity, and communication skills that are necessary for every part of life.

Regardingly, the Turkish National Ministry of Education prepared a new curriculum based on the constructivist approach and student-centered education, and it started to be implemented in the academic year of 2004-2005. MEB EARGED (2004) as cited by Bulut (2006) defined this student-centered education as an approach focusing on a self-learning, individual differences, thinking skills, and creativity of learners. MEB (2007) as cited in Mancır's dissertation (2014) was mention that student-centered education constructs the teaching and learning process in the way of providing student participation. Student-centered education aims to educate students -who have scientific thinking ability, who are productive, who can reach information, who has the communication ability, who can use technology effectively, who can adopt universal values- by considering students' characteristics.

According to the results of the literature review that McMahon (2005) did on student-centered education, student-centered learning can be summarized as an approach in which students make learning choices, move beyond being passive

listeners, and that establishes a new and more egalitarian balance of power between students and teachers.

Rather than being a passive listener and note-taker, active learning is essential for student learning pedagogy. Active learning is a concept integrated with student-centered education. Prince (2004) claims that active learning enables students to engage in meaningful learning activities and think about what they have learned and experienced. Student activity and engagement are key elements of active learning.

Learner-Centered Psychological Principles: A Framework for School Reform and Redesign (APA, 1997, p.3-7) suggested that student-centered education has fourteen principles under four factors related to learning.

A) Metacognitive and Cognitive Factors

1.   The attribute of the learning process

2.   Instructional support and guidance

3. Link new knowledge with previous knowledge

4. Strategic thinking

5.   Higher-order strategies for the application of critical and creative thinking

6.   Environmental factors that affect contextual learning such as culture, technology, and instructional activities.

B) Affective and Motivational Factors

7. Motivation impacted by the person's emotional states, beliefs, interests and goals, and habits of thinking

8. Learner's intrinsic motivation to learn influenced by creativity, higher-order thinking, and natural curiosity to learn

9. The more complex the information and the more difficult the skills to be learned, the learner needs more effort and more guidance.

C) Developmental and Social Factors

10. Differentiation of development of the learners within physical, intellectual, emotional areas, and different learning opportunities, experiences, and constraints that they encounter.

11. Social interactions and communication with others that have a direct impact on learning.

D) Individual Difference Factors

12. Learners' different strategies, methods, and capacities for learning are directly connected to prior experiences and heredity.

13. Language, culture and social background of the student

14. Setting standards in reasonable coercion, evaluating both the learner and the learning process

As a result of the review of the literature on student-centered education, Henson 2003), summarized the dispositions of student-centered education as;

- Education should be based on experience.
- Each student's unique qualifications and recommendations should be considered when planning a curriculum
- The student's perceptions of learning should be taken into account while developing the curriculum.
- The curiosity of the learner should be nurtured.
- Learning should also address emotions.
- The learning environment should be free from fear.

According to Gillia (2016), there are cognitive, psychological, economic and political reasons for choosing a student-centered approach to education like that it develops students' higher-order thinking skills. It provides human capital development and supports democracy in the classroom.

These reasons can be grouped under three main headings:

- *Cognitive and Psychological:* Student-centered education improves student's higher-order thinking skills, motivation, and cooperation.

- *Economic:* Student-centered education provides human capital development, that has the skills and content knowledge to be an entrepreneur in a changing economic environment.

- *Political:* Student-centered education is based on egalitarian relations between students and teachers and the democratic classroom environment. So it is essential in terms of assimilating democracy.

2.2. An Instructional Theory

When the educational paradigms that emerged after the Industrial Revolution are examined, it can be concluded that education regards individuals as labor force rather than aiming to develop them in an academic or professional sense. In this direction educational system ignores the differences of individuals by subjecting them to a standard instruction and it evaluates them according to success rankings with norm-referenced tests. In such assessments, students whose performance could be improved were ignored, and they often had to leave formal education (Reigeluth, 2012).

In contrast to this behaviorist educational system adopted after the industrial revolution, the post-industrial education paradigm has emerged. According to this view, what should be questioned and evaluated should be applied according to the instructional system, not the students. This system was based on students' learning and skill development, rather than putting them in the order of success. As a result of

this approach, the instructional theory was born to develop and organize instructional processes (Reigeluth, 1987).

Reigeluth (2012) explained some core idea of the post-industrial paradigm of instruction as:

- The post-industrial paradigm is learning-focused which is the opponent's view of sorting focused instruction.
- The post-industrial paradigm is learning-centered so; instructional methods are planned to put learners forward rather than teachers.
- In contrast to only teacher presentation, students learn by doing,
- An instruction is an attainment based process - in other words, students need to complete the standards of achievement in order to move on to higher levels of subjects and knowledge because they can only succeed at a higher level. This was called 'mastery learning' by Bloom (1968).

Meril (2007), an educator, instructional technology and design expert, has suggested that there are five instructional principles to improve the quality of instructional processes. These are: task-centeredness, activation, demonstration, application and integration. On the other hand, according to Reigeluth and Carr-Chellman (2009) these principles should be familiar to all instructional designs and settings, but there may be differences in the nature of the context where they are applied. These contextual differences revealed the principle of situationality of instruction. These situationalities can be explained as different approaches and learning outcomes.

Content and methods of instruction are customized according to students' learning style and pace to realize attainment based progress. As described by Gardner (1999) students have a different profile of intelligence so standardized instruction prevents their development. The new instructional paradigm highlights customized instruction which suggests making individualized learning plans for different learner characteristics.

In the new paradigm, formative assessment is used to guide inclusive student learning in the instruction by giving instant feedback and guidance process and also summative assessment is used to certify student attainment (Reigeluth, 2012). Criterion-referenced testing is necessary for learner-centered instruction because instead of comparing students to each other, students can evaluate each other individually according to their abilities and achievements. Team-based learning and collaboration are also essential for the new paradigm of instruction. Thanks to this they can also make peer learning as well (Reigeluth, 2012).

The way to ensure lifelong learning is through the love and motivation of learning. The post-industrial educational paradigm aims to instill a love of learning for students. In this context, authentic and participatory activities are provided to increase students' internal motivation (Reigeluth, 2012).

2.2.1. Constructivist Instructional Design and Models

Considering that the post-industrial educational paradigm has a common view with the constructivist approach, studies have been conducted on constructivist instructional designs in order to create learning environments appropriate to the constructivist approach. Hannafin and Hill (2002) identified the key concepts in the instructional design process according to the two opposing approaches which are constructivist and traditional (Table 2.1)

Table 2.1

Key Concepts in the Instructional Design Process

Phase	Traditional Approach	Constructivist Approach
Analysis	Content Learner Instructional need Instructional goals	Context Learner Defined problem Transmission of key concepts
Design	Teaching objectives Task analysis Criterion-referenced assessment	Learning objectives Determination of individual/group learning steps Context-oriented assessment
Development	Teaching material development	Creating a learning source and activity
Implementation	Teacher: Referring and transmitter Learner: Receiver Focus: Reaching goals	Teacher: Facilitator, guide Learner: Referring, producer Focus: Problem-solving
Evaluation	What do learners know?	How do learners know?

*Note.*Table adapted from Hannafin and Hill (2002)

Although some of the instructional models to be explained in this section have different characteristics, it is noteworthy that they focus on certain principles of constructivism.

2.2.1.1. Appreciative Inquiry-4D Model

Norum (2009) criticized deficiency-based traditional models and emphasized the need for value-based models. Norum - who created the 4D learning cycle model that takes the initials of the words discovery, dream, design, destiny- argues that instructional models should focus on good and possible, instead of finding and correcting evil. In the exploration step, questions are asked to discover the best level of performance. The questions of "What can be?" in the imagination step, "What should be?" in the design step and "What will happen?" in the creation step are sought.

2.2.1.2. Layers of Negotiation Model

In layers of negotiation model proposed by Cennamo (1995), it is emphasized the importance of reflecting instructional content from multiple perspectives in the design process. In the model where the learners are also considered as customers, the designer and the customers are expected to improve the process by sharing their perspectives. The general characteristics of the negotiation-based progress model are as following:

- In the process, it is essential to ask the right questions to learners rather than to assign linearly assigned tasks.
- Project-based designs, which depend on decision-making rather than predefined procedures, are essential in the instructional design process.
- Instead of separated steps, the questions should be dealt with in a spiral manner. In other words, it should be possible to go back and go into detail.

2.2.1.3. Recursive-Reflective Instructional Design Model

Recursive-Reflective Instructional Design Model was proposed by Willis (1995). He considered constructivist instructional design as a general set of principles rather than a step-by-step procedure. According to Willis, constructivist instructional design is iterative, nonlinear, reflective and participatory design. Table 2.2 shows the stages of the model (Willis, 1995).

Table 2.2

Stages of Recursive-Reflective Instructional Design Model

Phases	Describing	Design and Development	Propagating
Processes	Grouping and supporting participants Innovative problem solving Developing contextual understanding	Selecting a development environment Selecting media and format Defining assessment procedures Designing and development product	Summative Assessment Product Dissemination Assimilation

Note. The table adapted from (Willis, 1995).

2.2.1.4. E Models/ Learning Cycle Models

The beginning of constructivist instructional designs known in the literature as the learning cycle or E models emerged in the Science Curriculum Improvement Studies (SCIS) by Atkin and Karlplus (1962). The model which has three stages called exploration, invention, and discovery, is based on the students' conceptual discussion of their learning gains in the classroom. Then, Bybee (2002) created the 5E Model within the scope of the Biological Sciences Curriculum Study (BSCS). The 5E Model includes a series of learning units to be used in instruction. The steps of the 5E Model are engagement, exploration, explanation, elaboration and evaluation. It is organized by teaching activities appropriate for the purpose of each step. Einskraft (2003) created the 7E Model by adding the "elicit" step to arouse curiosity at the beginning of the 5E Model and by adding an "extend" step to provide learning transfer at the end of the instruction.

2.2.2. The Origin of the 5E Instructional Model

2BM is an instructional model whose theoretical framework is based on the Bybee's 5E Instructional Model and has common steps with the steps of the 5E model. 2BM Instructional Model was developed by a private school in Ankara and is used by K-12 teachers working in this school. In order to better understand the 2BM model, it

is necessary to examine the origin of the 5E instructional model. Therefore this section will focus on learning models designed until the 5E learning model was developed.

2.2.2.1. Historical Models

The origin of the term "instructional model" is based on the works of a German philosopher Johan Friedrich Herbart. He argued that the development of character is the primary purpose of education. Also, students' interest and their conceptual understanding are two critical elements for the development of character. For Herbart, direct experience of an individual with the world and, social interaction with others create the source of interest. So, the teaching process should address students' interests. Also, the conceptual understanding of students is shaped by their background knowledge and previous experience. If students can relate new opinions with their prior knowledge in a coherence, teaching can be meaningful. After these arguments, Herbart provided an instructional model that is one of the first systematic approaches to teaching (Bybee et al., 2006). Table 2.3 summarizes Herbart's instructional model.

Table 2.3

Herbart's *Instructional Model*

Phase	Summary
Preparation	The teacher reminds students of experiences and knowledge.
Presentation	The teacher presents the students to new concepts and allows them to relate them with their prior knowledge.
Generalization	The teacher shares the scientific knowledge relevant to the subject learned and allows students to develop a new concept.
Application	The teacher allows the students to experience a new concept in different situations.

Note. The table is taken from (Bybee et al., 2006)

John Dewey is another important person who is famous for his studies on reflective thinking. He emphasized that an instructional process depends on experience and reflective thinking. Students should associate their experiences with different situations and contexts, and they should not only experience something but also share these experiences with others and transform them into different situations. The model of reflective thinking designed by Dewey underlines five characteristics of reflective thinking: defining a problem, noting conditions related to the problem, formulating a hypothesis, elaborating the value of various solutions and testing the ideas (Bybee et al., 2006). Table 2.4 summarizes Dewey's reflective thinking model.

Table 2.4

Dewey's Instructional Model

Phase	Summary
Sensing Perplexing Situations	The teacher provides the students with an experience in which they feel inadequate and surprised.
Clarifying the Problem	The teacher helps the students to identify and present the problem.
Formulating a Tentative Hypothesis	The teacher allows the students to formulate a hypothesis by linking the present situation with past experiences.
Testing the Hypothesis	The teacher provides the students with experimental settings to test the hypothesis.
Revising Rigorous Tests	The teacher proposes tests to decide whether to accept or reject the hypothesis.
Acting on the Solution	The teacher asks the students to evaluate the test result and share their ideas for the solution of the problem.

Note. The table adapted from (Bybee et al., 2006).

The definition and use of the concept of the "learning cycle" originate from the work of Heiss, Obourn, and Hoffman by the 1950s. They designed an instructional model that is based on Dewey's reflective thinking approach, and the model took part in science teaching textbooks (Bybee et al., 2006). Table 2.5 summarizes the learning cycle model.

Table 2.5

Heiss, Obourn, and Hoffman Learning Cycle (Bybee et al., 2006).

Phase	Summary
Exploring the Unit	The teacher enables the students to ask questions about the unit, put forward hypotheses, and offer solutions with various activities.
Experience Getting	Students test and interpret the hypothesis and draw conclusions about the solution.
Organization of Learning	Students summarize and explain the test results.
Application of Learning	Students adopt the knowledge and skills they have learned in new situations.

Note. The table adapted from (Bybee et al., 2006).

2.2.2.2. Contemporary Models

Robert Karplus's Science Curriculum Improvement Study (SCIS) at the University of California is counted as the starting point of contemporary instructional model studies. Karlplus has worked on children's thinking and definition of the facts, and as a result of his study, he has designed a science teaching process based on Piaget's developmental psychology. In 1961, J. Myron Atkin, at the University of Illinois, supported Karplus's ideas about science teaching. Then Karlplus and Atkins designed a teaching model called *guided discovery* (Karplus, Robert and Thier ,1968). Atkin tested this instructional model with a variety of teaching materials and activities and observed students' reactions. As a result of his investigation, he elucidated that the learning process of the students improved positively.

In 1967, Robert Karlplus and his colleague Herbert described the steps in their learning model with clear and original terms. They entitled three-stages of learning cycle as *exploration, invention, and discovery. The exploration*, which is the first stage of learning, refers to the newly acquired, unstructured knowledge and experience of the students. In the next stage, *the invention,* definitions are developed by associating past experiences with newly acquired knowledge or phenomena. At

the *discovery stage,* students are expected to explore how the new concept applies to different situations by transferring knowledge (Karplus, Robert, and Thier 1968).

In the mid-1980s, Biology Science Curriculum Study (BSCS) established a commission led by Robert Bybee as a principal investigator to prepare a new curriculum for science and health courses in primary schools. This commission designed the 5E model based on constructivist learning and adapted from the learning cycle model.

According to Bybee, learning is not a linear process. In order to perceive new knowledge, learning must be associated with past experiences and reinforced with new experiences. To ensure this, Bybee improved the 3E learning cycle model and added a new step named 'engagement' as an initial step to the 3E model and added an evaluation step to the end of the learning cycle. Finally, the steps of the 5E model are; engagement, exploration, explanation, elaboration, and evaluation (BSCS, 2006).

1.Engagement: In this step, it is aimed to draw the attention of the students to the subject to be learned and to arouse their curiosity. Besides, activities are applied to remind students' background knowledge and to reveal misconceptions. Students are allowed to share their right or wrong ideas and thoughts without restriction.

2. Exploration: It is the step in which students gather information and research through individual or group work in order to explain new situations they face. The students are given sufficient time to analyze and organize the information they have collected. The teacher guides the students, observes them, and directs them by asking them questions to think.

3. Explanation: At this stage of student-teacher collaboration, students are expected to define new concepts with the help of the information they collect. The teacher encourages them to make explanations and supports them with scientific explanations to eliminate misconceptions.

4. Elaboration: Students are expected to use the concepts and knowledge they have learned to explain new and different situations. Thus, students develop their understanding of the newly learned concept and associate it with real life. The teacher is expected to present problem situations that will force the student to use his/her high-level thinking skills.

5. Evaluation: Even though the teacher makes an overall evaluation after the elaboration step, the assessment is carried out during all stages because it is crucial to evaluate throughout the process in order to improve the operation of the learning cycle. The teacher assesses students' cognitive, affective, and psychomotor levels of learning outcomes with various assessment tools; also, students make peer assessment. Figure 2.1 reveals the origins and transformation of the instructional models
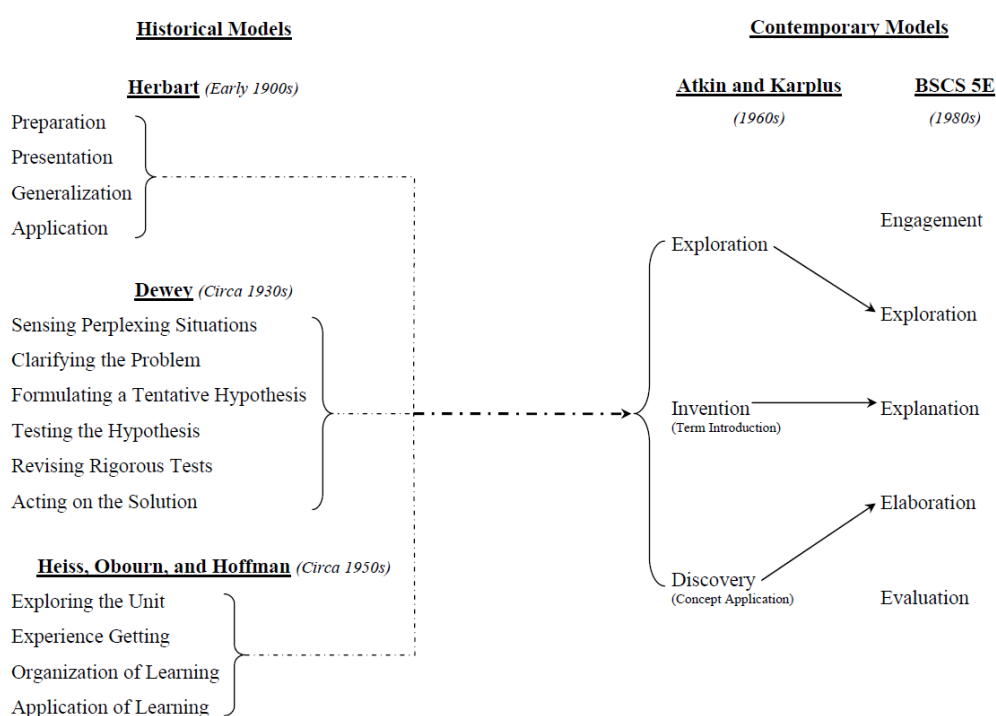
Figure 2.1 *Origins and Transformation of the Instructional Models* (Bybee et al., 2006).

Instructional models are designed to enable students to learn cognitively and to learn by doing and living. The common point of all the above-mentioned instructional models from the past to the present is that they have an instructional step in which the student can experience and apply the learned knowledge. In this study, the 2BM instructional model is designed by taking the general structure of the BSCS 5E instructional model as a pattern because The 5E instructional model offers the student the opportunity to participate in each learning step actively.

2.3. What is the 2BM Model?

The 2BM is an instructional model organized by program development specialists to be used in educational activities in a private school. The 2BM instructional model aims to bring the standard to the quality of education at all levels and classes in the school and to minimize inter-class level differences.

The steps of the 2BM model are designed to improve students' skills, such as problem-solving and critical thinking. Also, it is among the aims of the model to make students a sense of the information they have learned and associate them with daily life. Also, as (Ertürk, 2013) stated, learning should be a product of life, and educational activities should be designed towards experiences that create meaningful learning. In order to provide a multifaceted evaluation of these learning experiences, the 2BM model has multiple evaluation steps. Figure 2.1 indicates the stages of the 2BM Model. The original model is in Turkish and translated into English by the researcher.
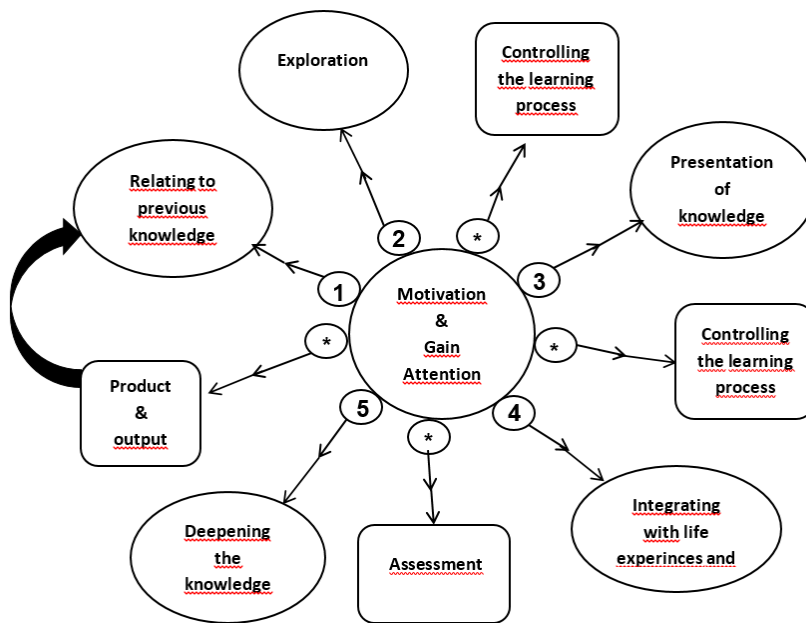
Figure 2.2 *Overview of 2BM Instructional Model*

The 2BM instructional model includes the steps of the 5E instructional model with similar characteristics. Relating to previous knowledge, exploration, presentation of knowledge, deepening the knowledge, and evaluation phases of the 2BM model are similar to the 5E model's five main phases which are engagement, exploration, explanation, elaboration and evaluation, respectively.

On the other hand, there are points where the 2BM model differs from the 5E model. The main difference of the 2BM model from the 5E model is that, after exploration, presentation of knowledge, integration with life experiences, and deepening the knowledge phases, the standard assessment steps are used to assess the learning status of the student. These assessment steps are essential for the students to succeed in the next steps. Assessment tools are selected according to the structure and purpose of the activity performed in the previous step.

Another difference is that the 2BM model has an extra new phase that aims to enable students to associate and make sense of knowledge with life experiences. At this stage, the student is asked to answer the questions that "How does this information appear in my daily life?" and "What is the benefit of learning this information?"

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Finally, in the last step of the 2BM model, which is the product and the output phase, students are expected to expose learning outcomes that they develop during the whole process. These learning outcomes can be knowledge, skills, attitudes, and values. The type of students' product and output can be varied according to the course achievements and the nature of the course. Table 2.6 indicates the phases of the 5E model and the 2BM model.

Table 2.6

Comparison of 5E model and 2BM model

Phases of the 5E Instructional Model	Phases of 2BM Instructional Model
Engagement	Relating to previous knowledge
Exploration	Exploration
	*Controlling the learning process
Explanation	Presentation of knowledge
	*Controlling the learning process
	*Integrating with life experiences
Evaluation	Assessment
Elaboration	Deepening the knowledge
	*Product and output

2.3.1. Theoretical Framework of the 2BM

Progressivism, which is the reflection of pragmatism to education, is the educational philosophy of the 2BM model. According to progressivism, the instructional process should be based on students' interests and should involve the solution to human problems (Ornstein & Hunkins, 1998). Similar to this progressivist idea, 2BM also puts the student in the center of learning. The model helps students to integrate knowledge into life. Students actively participate in the learning process and develop problem-solving abilities. Instead of memorization of scientific knowledge, the 2BM Model highlight the necessity of adopting new problem situations and producing knowledge.

In this regard, the 2BM model is based on constructivism, a theory of cognitive learning approach. Constructivism focuses on the students' ability to build their

learning processes and mental meaning frameworks (Hewitt, 2006). Similarly, the purpose of the 2BM model is to guide the instructional process by building knowledge on previous experiences.

The 5E instructional model developed by Bybee is the framework of the 2BM instructional model. The underlying logic is to create a learning cycle as in the 5E Model and to maintain this cycle by building on the students' existing knowledge and skills. Although Bybee has designed the 5E Instructional Model for teaching science courses, the model can also be implemented in social science and language teaching lessons. Likewise, the 2BM Model can be used in planning many courses from science to art. The 2BM Model aims to motive students to learn by inquiring, producing, and deepening the knowledge. Teachers have the most significant role in planning lessons in line with the 2BM model, and in order to achieve success in the implementation of the model, they have various responsibilities. Primarily, teachers write lesson plans by considering the 2BM instructional model. Then they cooperate with a curriculum specialist of the school to check the relevance of the educational activities for the 2BM model. As a result of the feedback and suggestions of the curriculum specialist, they reorganize the lesson plans. Finally, after teachers implement the lesson plans, they discuss the implementation process with curriculum specialists and take notes for future revisions.

2.4. Student Centered Education in Turkey

The curriculums have been revised many times since the foundation of the Turkish Republic and efforts were made to put students forward in the teaching and learning process. However, the first mention of the curriculums with a constructivist approach took place in 2004. The Ministry of National Education has prepared a curriculum that focused on developing 21st-century skills such as creativity, communication, problem-solving, critical thinking, entrepreneurship, and the use of information technologies. This program was first implemented in pilot primary schools in the 2004-2005 academic years. With the new program, student assessment was revised, and new assessment tools such as self-assessment, peer assessment, performance

assessment, observation form, and student portfolio have taken place in the curriculum.

In the 2016-2017 academic years, it was announced that the curriculums would be renewed by declaring the necessity of renewing existing curricula to meet the changing needs of individuals and society in line with the innovations and developments in learning and teaching theories and approaches. The significant changes, innovations and renewals made in the renewed curricula in 2017 are as follows (Board of Education, 2017):

1) The renewed curricula are kept simple and understandable.

2) The nature of the courses (the specific characteristics of the discipline) was taken into consideration when determining the competences and skills aimed at gaining students.

3) The essential competencies and skills that are aimed to be provided to the students are shared in all disciplinary areas.

4) The curriculum includes competencies and skills specific to disciplinary areas.

5) The introduction of curricula includes a section titled "Value (s) Training" and provides explanations on why values are included in the curricula, how they can be transferred to students in the learning and teaching process, and which teaching methods and techniques should be used when giving values.

6) The values are consistent with the nature of the course, and the curricula gains and integrity is taken into consideration.

7) While the curricula are being renewed, the contributions of different basins of culture and civilization have been clarified and balanced examples are tried to be given.

8) In the renewed curricula, simplification and reduction of content density are prioritized.

9) In the renewed curricula course objectives encourage students in requiring the use of metacognitive skills, abstracting event for learning to be meaningful, enabling the association of facts and concepts with daily life as much as possible, directing as much practice as possible so that learning can be permanent, serving to relate the previous knowledge and other disciplinary areas, using information and communication technologies.

10) Repetitive units, subjects and/or achievements in different disciplinary areas are taken into the discipline area in which they are more related, and references are made to other disciplinary areas where necessary.

11) The achievements of the subjects which are related in content but which are under different headings and / or units are brought together in terms of ensuring the integrity of the subject and facilitating learning.

12) For meaningful and lasting learning, it is vital that the information learned corresponds to daily life and that the acquired knowledge and skills are reinforced by the application. In this regard, it is essential to make applications that students will relate to daily life in terms of their age level or that they will need to specialize in the profession they are interested in.

13) Demonstrate the flexibility required for students with special needs when implementing curricula; it is envisaged to prepare and plan activities in line with the interests, wishes, and needs of the students.

14) In the implementation of the curriculum, the focus is on being inclusive and preserving all kinds of differences, therefore demonstrating the flexibility required for students with differences in the implementation of the curriculum; students' socioeconomic, cultural, individual, intellectual differences, demands, and expectations are taken into consideration while planning course activities.

In the 2017-2018 academic year, the new curricula were started to use in grades 1, 5 and 9 and next year gradually at all levels of education. The focus of these curricula was on values education and 21st-century skills. In the new curriculum, twelve key competencies were identified; communication in mother tongue, communication in foreign languages, mathematical literacy and science-technology competences, digital literacy, learning to learn, social and civic competencies, entrepreneurship, cultural mindedness and expression. National, spiritual and universal values that are aimed to be gained to students in the programs are justice, friendship, honesty, self-control, patience, respect, affections, responsibility, patriotism and helpfulness (Board of Education, 2017).

One of the most striking changes in the new curriculum is the reduction of the number of units in some courses, ie the simplification of the program. Other noteworthy features of the programs are underlining the development of disciplinary skills, values education, the inclusion of different cultures and the importance of linking knowledge to life (Board of Education, 2017).

The recently renewed curricula seem to take the student development as a whole beyond giving objectives and achievements of the courses and aim to integrate the necessary competencies and values in order to ensure the success of the individual in academic, professional and individual life. On the other hand, the lack of clear instructions and instructions on how this integration will be implemented in the learning process has created confusion among teachers. Therefore, more detailed information is needed on the implementation of the new curriculum (Education Reform Initiative, 2018).

2.5. Related Studies

Related studies with student centered education, constructivism and 5E instructional model were shared according to the publication date.

2.5.1. Related Studies with Student-Centered Education and Constructivism

Even though the foundation of student-centered education was based on pedagogical studies in the western countries, it has found its place in the education policy of many countries in the world over time, and traditional education has been replaced by student-centered education.

According to Zophy (1982), the most crucial problem faced by teachers about student-centered education was the process of preparation for class because teachers need to prepare creative materials and teaching activities for student-centered teaching and this preparation process increased their workload and required extra time. Another stated problem was that teachers who had very long course contents such as history had problems with educating subjects using student-centered methods due to concern about educating course content. Students' resistance and unwillingness were also among the reasons preventing the implementation of student-centered activities.

Ellsworth, (2002) emphasizes in the article "Learner Centered Courses in the Universities: A Powerful and Meaningful Adition" that learner-centered instruction can be a powerful way to reduce school dropouts and increase attendance because it builds a learning community which conjunct the students to the school.

Altinyelken (2011) investigated the student-centered curriculum reforms and revealed many problems complicating the implementation of student-centered education. In the research, a case study was conducted to take teachers' views on student-centered instruction on classroom practices and perceived challenges As a result of the study and according to teachers' expressions, challenges in implementation were deficiencies in teacher education, high-class sizes, lack of material, national examination system, parental opposition, and the unwillingness of students.

On the other hand, Duncan and Buskirk-Cohen (2011)- two education and psychology professors- argue that when students are assessed with student-centered

strategies, they are more successful, creative, and motivated compared to the traditional assessment. They conducted a study in an undergraduate teacher education program at Meredith College which was a private women's institution. The study shows that when students create their assessment, they can enjoy and enthusiast to show their performance; they can show their differences and apply knowledge creatively.

Furthermore, Ahmed (2013) conducted a study to investigate the situation of student-centered teaching strategies at Middle East University. Participants in the study were graduate education instructors from four departments. As a result of this study, it was revealed that the traditional teaching methods were replaced with the understanding of education, following Dewey's vision in which student was at the center of teaching.

Student-centered teaching has been recognized to be an essential approach, supporting student's cognitive and affective development, but the way it was applied and perceived in different cultures and countries may vary. Frambach, Driessen, Beh, and van der Vleuten, (2014) examined the behavior and skills of students with different cultural backgrounds in the discussion method that was one of the student-centered teaching methods. A comparative case study was conducted by using problem-based learning in three medical schools in East Asia, Western Europe and the Middle East. As a result of the study, they explained that student-centered education was useful in different cultural environments as well, but there were differences in context, process, and results. The reason for this differentiation was thought to be the difference in communication behaviors.

Two main learning strategies of student-centered education are problem-based learning and project-based learning. They are essential to enable students to participate in the learning process actively to encourage them to collaborate and to develop skills such as problem-solving, critical thinking, and creativity. On the other hand, the research of Dole, Bloom, and Kowalske (2015)- completed through online interviews with 36 participants who completed the gifted education program at a

regional state university in South East- indicated that teachers face some problems while integrating problem-based and project-based learning strategies in their classrooms. The main problems raised by teachers were; lack of material, the full content of the formal curriculum, and standardized tests. Also, teachers mentioned that they have not had enough knowledge and experience about student-centered pedagogy and that the motivation of students was not sufficient (Dole, Bloom, and Kowalske, 2015).

In our country, the extent to which student-centered curricula and teaching strategies can be applied in schools has always been the focus of discussions. In addition to the physical impossibilities of schools, teachers' readiness is an important factor affecting the practice. As a result of the study- investigating the extent to which student-centered education can be applied in primary, secondary and high schools in Düzce- it was revealed that teachers are not adapted to practice student-centered teaching strategies yet. For this research, Arseven, Sahin and Kiliç (2016) collected both qualitative and quantitative data, and there was a contradiction in teachers' responses according to the results of these two types of data. This exploratory research conducted 685 teachers for quantitative data and 13 teachers for qualitative data. While qualitative interviews revealed that teachers do not yet have full competence in planning, implementation, and evaluation stages, the analysis of quantitative data revealed that teachers adopted and applied student-centered education in planning instruction, application and assessment.

There are also several theses about student-centered education and constructivism in the Turkish context. Findings of those studies were suggested that teachers had a positive attitude towards student-centered teaching in general, but there were problems in practice due to infrastructure problems of schools, inadequate teacher training, crowded classes, and intensive preparation for national exams. The findings of several theses on student-centered education are shared in the following paragraphs.

Kalender (2006) conducted a descriptive study investigating the problems faced by classroom teachers during the implementation of the constructivist approach-based mathematics program. Participants of the study were 226 classroom teachers selected from 20 primary schools in İzmir. Results of the study revealed that although teachers had positive attitudes towards the constructivist program, they expressed problems such as lack of sample materials and applications, and insufficient tools for the implementation of the program.

Korkut (2006) conducted an experimental study aiming to compare student-centered teaching in science education with the traditional method through the 8th-grade unit "Magnetism affecting our lives." Pretest-post test control group design was used for data collection and fifty-nine students were assessed with multiple-choice, short answer and matching questions. According to the findings of the research, a significant difference was found in favor of the experimental group students in which student-centered education was applied.

Likewise, Saydam (2009) examined the views and attitudes of teachers towards constructivist teaching practices and found that teachers had positive attitudes towards the constructivist approach but they partially applied them in their classes. Data were collected from 187 teachers working in 11 elementary schools in Aydın province.

Next, Bostan (2007) received high school biology teachers' opinions about student-centered teaching. Forty biology teachers participate in the study from high schools in İstanbul Anatolian Coast. As a result of the study, it was found out that although Anatolian high school biology teachers stated that they used student-centered education in their courses, they did not know the characteristics of student-centered education wholly and adequately.

Bulut (2010) also conducted a study aiming to evaluate the problems encountered during the implementation of the new primary education programs in consultation with the primary school administrators. This survey study was conducted with 230 school administrators of 51 primary schools selected from 7 districts of İzmir

province. As a consequence, the elementary school administrators described the constructivist approach as a positive development and agreed that it saved students from memorization, that students were more active in the learning process and that the teacher should be a guide in the lessons. They also stated that the constructivist curriculum makes teaching more fun and improves students' social skills. On the other hand, they drew attention to problems such as lack of infrastructure, lack of equipment and materials, the seating arrangement in the classrooms. Administrators also emphasized the importance of school-parent unity, school management, and teachers' cooperation in order to achieve constructivist teaching success.

Following, Mancır's (2014) research in which 40 faculty members from 5 different faculties were interviewed and a scale was applied to 240 students aiming to determine the perception and application levels of student-centered education of faculty members; it is concluded that members of education faculty had general information about student-centered education, but they did not have detailed information about it, and therefore they did incomplete and inadequate practices. Also, it was concluded that the students of the faculty of education perceived student-centered education in terms of its important lines, but they did not have enough information about the implementation and assessment of student-centered learning.

Akcan (2018), in a phenomenological study conducted with 11 teachers working in 5 schools in the Alanya district of Antalya, aimed to take classroom teachers' opinions about the implementation of student-centered education. The findings of the obtained are;

- Student-centered education increased the participation of the students and enabled them to be more active.
- Students were provided with an environment where their ideas were taken in the solution of the problems and where they could express themselves.
- Thinking activities were made for students to view the situations from different angles.

- Student-centered education strengthened communication in the classroom.
- Teachers prepared activities for the course, following student level and subject content, and they made necessary changes in the classroom layout during the activity.
- Considering individual differences in teaching affected the use of time negatively.
- The crowded classrooms adversely affected student-centered education.

Finally, Erdem (2018) took the opinions of the 22 school administrators and teachers working in the secondary school in Bilecik province on student-centered education, and it was concluded that the teachers generally had a positive attitude toward student-centered education. However, they stated that factors such as crowded classrooms, lack of time, the cultural structure of our country, the presence of central placement exams had a negative effect on the application process and therefore, they turned to teacher-centered methods. Teachers were also not ready and accustomed to this process pedagogically because university education and seminars were insufficient, and they said that their reputation in the student-centered education process was damaged. In order to increase the morale and motivation of the teachers, studies should be carried out, and parents should be informed about this process.

2.5.2. Related Studies with 5E Instructional Model

In their study published in 2007, Bozdoğan and Altunçekiç received the opinions of pre-service science teachers about the implementation of the 5E instructional model in the classroom. Thirty students attending the Science Laboratory- 1 course from Ahi Evran University Faculty of Education Science Teaching Department in the 2005-2006 academic year were included in the study. The answers to the open-ended interview questions after ten weeks of practice revealed that the 5E instructional model had positive aspects of instruction but could not be fully implemented due to problems such as lack of materials, timing constraints, crowded classrooms, and lack of knowledge of the methods by the instructors.

Similiarly, Özsevgeç (2006) conducted a study aiming to evaluate the effectiveness of the student guide material that was developed according to the 5E Instructional Model for Force and Motion Unit. The sample of the study consisted of eighty-five 5th grade students from three different primary schools in Trabzon. There were thirty-seven students in the experimental group and thirty-four students in the control group. Data were obtained by achievement tests, science and technology lesson attitude questionnaire, semi-structured observation forms and student interviews. The results of the study showed that the student guide material made a significant difference in favor of the experimental group. Besides, it was explained that group work and portfolio evaluation had a positive effect on motivation.

Later, a study was carried out to investigate the effect of the implementation of the 5E instructional model in organic chemistry laboratory course on conceptual understanding of students, development of scientific process skills, and attitudes towards organic chemistry laboratory course. Participants of the study were thirty students in Gazi University Faculty of Education Department of Chemistry Education. In this study conducted by Sevinç (2008), the pretest-posttest control group design was used. Fifteen students were randomly assigned to experimental and control groups. Before the instruction as a pre-test; pre-knowledge test, scientific process achievement test, organic chemistry lab concept test and attitude test were applied. The results of the study showed that the 5E instructional model had a positive effect on students' conceptual understanding and scientific process skills, but not on their attitudes towards the course.

Çoruhlu (2013) aimed to investigate the effect of guide materials based on the 5E instructional model related to Solar System and Beyond: Space Puzzle Unit on 7th-grade students' conceptual change, retention of concepts, student achievement, and learning environment. In semi-experimental research design, seventy-two 7th grade students and one science and technology teacher from an elementary school in Trabzon participated. While it was clear that students had misconceptions about the concepts related to space before the application, it was found that the materials used

in the 5E instructional model application resolved the students' misconceptions and increased their academic achievement later on.

In another study, İlter and Ünal (2014) investigated the effect of using the 5E instructional model on students' cognitive, affective and social development in social studies course. In the 5th-grade social studies course, lessons were taught according to the 5E model for 11 weeks. In the study, problems were determined through observations and student views before the implementation, so an action plan was prepared to eliminate them. According to the findings, it was stated that 5E model applications increased students' motivation levels and positively changed their feelings and thoughts.

Anıl and Batdı (2015), have carried out a meta-analysis study aiming to compare the 5E instructional model and traditional teaching methods applied in Turkey. They examined fourteen academic studies and theses. As a result of the study, it was found that the 5E model had a positive effect on academic achievement and retention of students and it had a moderate effect on the attitude dimension. The study revealed that the 5E instructional model is useful in academic achievement, retention, and attitudes toward courses.

Moreover, Demir (2015) obtained the opinions of preschool teacher candidates about doing experiments using the 5E instructional model. Marmara University Preschool Teacher Education third-year students participated in the study. Both quantitative and qualitative data were collected and as a result of the study, it was stated that students had very positive opinions about designing experiments using the 5E instructional model.

Hassan (2015) conducted a study with eighty 11th grade students in a high school in Somalia-Borama, investigating the effect of physics teaching based on the 5E instructional model supported by interactive simulation on students' academic achievement and attitudes. In the research, which used a quasi-experimental model pretest-posttest with a control group, the courses were conducted by the researcher using interactive simulations and materials. An academic achievement test, physics

course attitude scale, semi-structured interview form, and subject test were used as data collection tools. The results of the study revealed that conducting a 5E instructional model instead of traditional methods had a positive effect on students' achievement and attitudes.

In another case, Çeliksoy (2017) conducted a study investigating the effect of using the 5E instructional model in social sciences course on students' academic achievement and attitudes. Fifty-seven seventh grade students in a secondary school in Çaldıran district of Van province were included in the study. Twenty-nine students participated in the experimental group and 28 students in the control group. Quasi-Experimental research design and semi-structure interview were used in the study. The results showed that the 5E instructional model had a positive effect on students' academic achievement. In addition, the students stated that the model made the lesson enjoyable and facilitated learning.

Lastly, Sezen Konur and Çimer's (2009) study investigating the opinions of prospective classroom teachers about the application of the 5E instructional model in the classroom environment was applied to thirty students who took Science Teaching - II course in Rize University Faculty of Education in 2007-2008 academic year. As a result of the 6-week practice, the answers given to the open-ended questions about applicability indicated that prospective teachers found the model feasible, but also they stated that some units were not appropriate to the model, that the implementation of the model was time-consuming, that the routine application of the model was boring, and that there were problems such as lack of material and class dominance.

CHAPTER 3

METHOD

This chapter presents the design of the study, research questions, description of variables, context, participants, data collection instruments, data collection procedures, data analysis procedures, and limitations of the study, respectively.

3.1. Design of the Study

The primary purpose of this study is to determine K-12 teachers' perceptions of using a student-centered instructional model called 2BM in a private school through a descriptive cross-sectional survey design. The research paradigm of the study was quantitative. Quantitative studies depend on a positivist epistemology, and the essence of positivist epistemology is transforming qualities into quantities, replacing empirical diversity with rational unity and presenting relations instead of presence (Verges & Huisman 2002, p.82). Teachers from different branches were the subjects of this study, and according to their opinions, this study reached objective results about using the student-centered instructional model. Teachers' perceptions were transformed into numerical data to make precise and holistic predictions. For these reasons, the quantitative research paradigm was conceivable for this study.

A cross-sectional survey is a research approach that intends to describe a situation, context, attitude, perception, or characteristics of a sample of a determined population (Creswell,2012). In cross-sectional research, data is collected from the sample at once (Fraenkel, Wallen & Hyun, 2012). This study is interested in the opinions of K-12 teachers about using a specific instructional model in a private school. Survey research was an appropriate way to describe the features of those specific teachers because, in survey research, information was collected to describe some aspects or characteristics such as attitudes or beliefs of the population

(Fraenkel, Wallen & Hyun, 2012). Participants of the study were teachers from the different profession but they had a common purpose of using student-centered instructional modal. The scale measured the perception of teachers at one time and only from one school so that this study can be counted as a cross-sectional survey.

To collect data, "A Scale for teacher perceptions toward using the student-centered instructional model" was used. This scale included closed-ended statements describing teachers' perceptions toward using the student-centered instructional model.

This study was based on a literature review on student-centered education, constructivism, and the 5E instructional model. Current researches are generally about the attitudes of teachers working in public school about national student-centered curriculum and use of 5E instructional model in specific course and subjects. They are also qualitative studies based on the interview method. Therefore, this study was designed as a survey method to collect data from teachers from different fields.

On the other hand, this study was applied to only K-12 teachers of only one private school because the school has its instructional model similar to the 5E instructional model, and all teachers have to design their courses by using this instructional model. So, this study does not aim to make large scale generalizations but it examines different teachers' perceptions toward strengths, weaknesses, opportunities, and threats of using a student-centered instructional model.

In other word, this study was a SWOT (strengths, weakness, opportunities, and threats) analysis based on teachers' perceptions toward the student-centered instructional model. SWOT analysis is an important tool for organizations to make quality management and strategic planning. The SWOT analysis aims to develop strategies that minimize the effects of threats and weaknesses and that maximize the existing strengths and opportunities by considering internal and external factors (Şahin, 2013). SWOT analysis is a useful tool to understand the effectiveness of the instructional model used in a private school and to plan for the future. According to

Özköse, Arı, and Çakır (2013), SWOT Analysis provides two main advantages for organizations. Firstly, the current situation of the organization is revealed thanks to the SWOT Analysis. Namely, it puts forward the strengths, weaknesses, opportunities and threats which the organization confronts. In this regard, SWOT is a "Current Situation Analysis." SWOT is also an analysis technique for determining and predicting the future status of the organization. From this second point, SWOT is a "Future Situation Analysis". In this study, a perception scale was applied to teachers to reveal the things that they find to be strong in the instructional model of the school, the things they find to be weak, the opportunities they have , the elements that threaten the use of the instructional model. Then based on current perceptions, an evaluation will be made to improve the quality of education and revisions will be discussed for the future.

The scale used in the research is prepared in a way that teachers' perceptions about using the instructional model are revealed in the sub-dimensions of strengths, weaknesses, opportunities, and threats. Accordingly, in the process of creating scale items, the literature was searched, and according to the results of this literature, the items that represent the strengths, weaknesses, opportunities, and threats sub-dimensions were written. In order to reveal the perceptions of teachers objectively, items were presented in a mixed way on the scale. The design of the study is summarized in Figure 3.1.

		Reviewing the literature
	Planning	
		Informal talks with teachers

		Defining target population(N=109)
	Population	
		Teachers in a Private school (N=100)

		Generating possible questionnaire items
Overall study design Cross--sectional quantitative survey research	Instrumentation	Validating The Insrtument Through getting expert opinion on TPSCIMQ questionnaire
		Piloting the questionnaire

	Data collection procedures	Collecting quantitiative data from teachers by the researcher

	Data analysis procedures	Quantitaive data analysis with Spss 20.0

		Descriptive statistics
	Reporting	Independent Sapmle T-test
		One-Way Anova

Figure 3.1 *Design of the Study*

3.2. Research Questions

This study is designed to answer the following research questions to reach the desired purposes:

1. What are the perceptions of teachers towards using the 2BM student-centered instructional model?

    1.1. What are the perceptions of teachers about the strengths of using a 2BM instructional model?

    1.2. What are the perceptions of teachers about the weakness of using a 2BM instructional model?

    1.3. What are the perceptions of teachers about the opportunities they have in the process of using a 2BM instructional model?

    1.4. What are the perceptions of teachers about the threats they have in the process of using a 2BM instructional model?

2. Do teachers' perceptions of using 2BM student-centered instructional model (2BM) change according to the following characteristics regarding its strengths, weaknesses, opportunities and threats:

    2.1. Do teachers' perceptions of using 2BM change according to gender?

    2.2. Do teachers' perceptions of using 2BM change according to age?

    2.3. Do teachers' perceptions of using 2BM change according to years of experience?

    2.4. Do teachers' perceptions of using 2BM change according to the graduation program?

    2.5. Do teachers' perceptions of using 2BM change according to the highest degree received?

2.6. Do teachers' perceptions of 2BM change according to the field of teaching?

2.7. Do teachers' perceptions of using 2BM change according to the student-centered instructional model using status?

3.3. Description of variables

The dependent and independent variables of the study are explained in this part.

Teachers' general level of perception was calculated by SPSS 20.0 and obtained a total score for the perception of using the student-centered instructional model. Exploratory factor analysis was conducted to identify dimensions of teacher perception. Then for each dimension, which is strengths, weaknesses, opportunities, and threats, total scores were calculated separately. Total perception scores of teachers were the dependent variable of the study.

Independent variables of the study are explained in the following paragraphs:

Gender: Participants' gender was asked with a level of measurement as nominal.

Age: Participants were asked to select their age from five different age range given in the form. These age ranges were determined as 21-25, 26-30, 31-35, 36-40, and above 41+. The level of measurement of age was determined as ordinal.

Experience: Participants were asked to select their years of experience from five-year intervals given in the form. These intervals were 1-5, 6-10, 11-15,16-20, and 21 years and over whose level of measurement was ordinal.

Highest degree gained: Participants were asked the highest degrees they graduated. These degrees were pre-license, undergraduate, master, and doctorate, which are an ordinal level of measurement.

Faculty of graduation: Participants were asked to identify the faculty they graduated, which were education faculty and science and arts faculty. There was also another

option for teachers who graduated from different faculties apart from education and science and fine arts faculties.

Field of teaching: Elementary, maths, science, Turkish, social science, applied courses, and foreign languages were the field of teaching. The level of measurement of the field of teaching was nominal.

Student-centered instructional model using status: This independent variable questioned whether the teachers used any student-centered instructional model before or not. If they used, they selected the "yes" option if they did not use, they selected "no." The level of measurements was considered nominal.

3.4. Context

Data was collected in a private school in Ankara, established in 2014. The school contains a kindergarten, an elementary school, a secondary school, an Anatolian high school, and a science high school. The school has a large campus and sufficient physical infrastructures. The average class size is fourteen students. Each class has a smartboard and internet connection. Science labs, information technology labs, STEM and Maker studios, a 3D lab, drama rooms, visual arts classes, gym center, swimming pool are all available to use in education actively. The school also has a big garden that includes a mini farm and an orchard. Teachers and students could benefit from all the facilities of the school.

The school has a research and development department, including curriculum specialists and measurement and evaluation specialists. Teachers can cooperate with this department while preparing their student-centered lesson plans and assessment tools. Specialists give feedback for their lesson plans to improve the teaching and learning process.

Briefly, this private school has full of facilities for both teachers and students, so it is suitable for student-centered education.

3.5. Population

The population of the study consisted of 109 teachers who were elementary school classroom teachers (*n*=12), middle school teachers (science, social science, Turkish language, math, and religious and ethics) (*n*=20), high school teachers (literature, math, science, social sciences) (*n*=44), foreign language teachers (*n*=18), and applied course teachers (*n*=15) in a private school in the 2018-2019 academic year.

During the implementation of scales, participants' willingness was taken into consideration; out of 109 teachers, 100 teachers participated in the study and signed the volunteer participation form (see Appendix A). The approximate participation rate was ninety-two percent.

As a general rule, the sample size should be at least five times the number of observed variables. If there are a strong, reliable relationship and a small number of prominent factor, the sample size can be 50 in the condition that it is higher than the number of variables (Tabachnick and Fidell, 2013). On the other hand, Kline (1994), mentioned that a sample of 200 people is generally satisfactory to create reliable factors, in fact, if the factor structure is clear and small, the sample size can be reduced to 100. Kline also explained that the subject-variable (item) ratio is kept at 10:1, but this ratio can be reduced to at least 2: 1.

The population of the study involved teachers working in a private school. The characteristic feature of the population was that they planned and practiced their courses using a student-centered instructional model determined by the school as an initiative for school improvement.

The result of the study did not intend to make a specific generalization. However, it can be inferred from the study what a private school teacher perceives from a student-centered instructional model and according to their perceptions instructional model can be revised and improved in a private school context.

3.5.1. Demographic Data

This section presents the demographic information of the teachers collected through the personal information form (see Appendix A). Personal information form includes the questions that reveal the participants' gender, age, total teaching experience, the highest degree they gained, department of graduation, the field of teaching, the class level they teach, educational institutions they worked before, and the status of using the student-centered instructional model.

The Gender: The sample of the study consisted of females mainly ($n=66$; 66%), and males were thirty-four percent of the participants ($n=34$; 34%).

Age: Participants' age distribution revealed that almost half of the participants were between the 26-35 age group ($n=52$; 52%) and the teachers who have just started the teaching profession were the only seven percent of the participant teachers

Total Teaching Experience: The highest value of total teaching experience of teachers was between 1-5 years group ($n=32$; 31%). Almost half of the participants' total experience was between 1-10 years group ($n=54$; 54%). Only twelve percent of the participants have experienced above the twenty years($n=12$; 12%).

Highest Degree Gained: The vast majority of the participants were undergraduates($n=68$; 68%). Thirty-one percent of teachers had a master's degree ($n=31$; 31%) while only one participant had a doctorate ($n=1$; 1%).

Faculty of Graduation: Half of the participants graduated from education faculty ($n=50$; 50%), and forty-percent of the participants graduated from science and arts faculty ($n=40$; 40%). The remaining ten percent graduated from any other institutes, which are sports science faculty, theology faculty, language history and geography faculty ($n=10$;10%).

Field of Teaching: Distribution of Participant Teachers' Field of Teaching Table revealed that the highest number of teachers in the school are science teachers ($n=20$; 20%), and with the percentage of eighteen foreign language teachers also took the second place ($n= 18$; 18%).

Class Level: In some fields, the teacher attends classes at different grade levels, so it was stated that they could make multiple markings for the class level part in the personal information form. Therefore, three different tables for each level are presented within this section. Majority of teachers teach to high school students ($n=66$; 66%) , 46 percent of teachers teach for middle school students ($n=46$; 46%) and 35 percent of teachers teach at elementary level ($n=35$; 35%).

Educational Institutions Worked Before: Considering that teachers may have worked in different types of institutions, it was stated that multiple markings could be made in the related section of the personal information form. Distributions of educational institutions which participant teachers worked before indicated that most of the teachers worked in a private school($n=66$; 66%). Forty-seven percent of teachers worked for exam preparation institutions($n=36$) and primary high schools($n=11$), which were founded for preparing students for high school or university entrance exams. Only two participants stated that they had previously worked in higher education($n=2$; 2%). The number of people who have not previously worked in a different institution is eight($n=8$; 8%).

Teachers' Student-Centered Instructional Model Using Status: The vast majority of participant teachers used a student-centered instructional model in their past experiences (n=77; 77%).

The summary of the demographic data of the participants can be seen in Table 3.1.

Table 3.1

Participant Teachers' Profile of the Study

Variable	Group	*f*	*%*
Gender	Female	66	66,0
	Male	34	34.0
Age	21-25	7	7.0
	26-30	28	28,0
	31-35	24	24,0
	36-40	19	19,0
	41 +	22	22,0
Total experience	1-5	31	31,0
	6-10	23	23,0
	11-15	19	19,0
	16-20	15	15,0
	21+	12	12,0
Highest academic degree gained	Undergraduate	68	68,0
	Master	31	31,0
	Doctorate	1	1,0
Faculty of graduation	Education faculty	50	50,0
	Science and arts faculty	40	40,0
	Other	10	10,0
Field of teaching	Elementary	12	12,0
	Turkish	11	11,0
	Maths	13	13,0
	Science	20	20,0
	Social sciences	11	11,0
	Applied courses	15	15,0
	Foreign language	18	18,0
Class Level	Class level (1-4)	35	35,0
	Class level(5-8)	46	46,0
	Class level(9-12)	66	66,0
Educational Institutions Worked Before	Exam Preparation Institution	36	36,0
	Basic High School	11	11,0
	Private High School	77	77,0
	Public School	21	21,0
	Higher Education	2	2,0
	Not Worked Before	8	8,0
Student-Centered Instructional Model Using Status	Yes	77	77,0
	No	23	23,0

3.6. Data Collection Instrument

A Teacher Perception Scale on Student-Centered Instructional Model Use"
(TPSCIM) was developed to collect data from teachers (see Appendix A). The main
reason for selecting a scale as a data collection instrument was collecting quantitative
data. The second reason was reaching more teachers' opinions about the subject; in
this way, the study would portray the attitudes on using the student-centered
instructional model. The scale was a five-point Likert scale ranging from strongly
disagree to agree strongly. Likert type scales are often used in social studies because
it allows researchers to portray an individual's behaviors, attitudes, and perceptions.
A strength of Likert measuring is that it contributes to the emergence of desired
intrinsic properties (perception, attitude, opinion) which is to be measured and it also
allows getting a total score related to this intrinsic property (Bayat, 2014).

In this study, the SWOT analysis technique was used to reach multi-dimensional
results related to perceptions of teachers on the use of the 2BM instructional model.
SWOT stands for strengths, weaknesses, opportunities, and threats. Since no SWOT
Analysis scale was developed to evaluate the instructional process in the literature,
there was a need to develop a new scale for this study. The scale aimed to reveal the
perception of teachers about the strengths and weaknesses of using student-centered
instructional model and opportunities and threats they have in the process of model
implementation. SWOT analysis dimensions are as follows:

Strengths: Superiority and capabilities of using a student-centered instructional
model compared with traditional instruction. Teachers' skills and positive attitudes,
social relations, and school opportunities can take part in strength.

Weaknesses: Factors that weaken the teachers' ability to use student-centered
instruction and which prevent their skills. Feeling inadequate and failed to keep pace
with student-centered instruction take part in weakness.

Opportunities: Situations that are offered to teachers by school and environment to
support the implementation of student-centered instruction. Professional

development seminars, school environment, school equipment are some of the opportunities.

Threats: Factors that prevent the success of teachers or put at risk using the student-centered instructional model. Lack of school/classroom infrastructure, inability to keep pace with innovation, financial factors, unskilled teachers can be some of the threats (Birel and Başar, 2010).

3.6.1. Instrument Development Process

The data collection instrument of this study has two sections. The first part is about the demographic information of the participants. In the second part, there are fifty 5-point Likert items aimed at revealing teachers' perceptions toward using the student-centered instructional model. The scale has been developed through the following process:

1. The literature on student-centered education and instructional models was reviewed to construct the scale items. Also, informal talks with the teachers have been conducted to consider cultural measures.

2. Books and resources on scale development were analyzed in-depth to construct the data collection instrument.

3. A 65-item pool was created by considering the literature on student-centered education and instructional models.

4. A survey scale was presented to four measurement and evaluation specialists and a curriculum and instruction specialist for content validity. As a result of their feedback, unclear items, and too long expressions and were revised.

5. It was applied to the METU Ethics Committee for ethical committee approval.

6. After the METU Ethics Committee had approved, a pilot test was applied to check the reliability of the scale.

The final form of the scale had two sections. The first one is demographic information of participants which were: gender, age, total teaching experience, highest degree gained, department of graduation, a field of teaching, the grade level to be studied, educational institution worked before. The second section included 58 Likert type questions and an optionally open-ended question to take different opinions of teachers about using the student-centered instructional model.

3.6.2 Rationale for Domains

5E Instructional Model is a student-centered model, often preferred by teachers for planning their lessons all around the world. Therefore, the effectiveness of this instructional model has been the subject of many pieces of research in the faculties of education. In this study, teachers' perceptions of an instructional model that is very similar to 5E Model was investigated, so researches in the literature on the implementation and effectiveness of student-centered education and 5E instructional Model were reviewed, and the findings of them created scientific rationale of survey items of this study.

With this survey, teachers' perceptions of strengths and weaknesses of using student-centered instructional Model, perceptions of the opportunities that support the implementation of the student-centered instructional model, perceptions of the threats that prevent the implementation of the student-centered instructional model were investigated. Therefore, domains of the study are strengths, weaknesses, opportunities, and threats of using the student-centered instructional model. Some of the rationales of the domains of the scale are as follows:

Perception of Strengths were written according to the researches of Anıl and Batdı (2015); Çeliksoy (2017); Çoruhlu (2013); İlter and Ünal (2014); Omotayo and Adeleke (2017); Özdemir and Balkan (2017); Polat and Baş (2012); Sağlam (2009); Salman (2006); Sevinç (2008); Sezen, Konur and Çimer (2009); Şadoğlu and

Akdeniz (2015). Those studies mentioned that student-centered instruction improves students' interest, motivation, learning outputs, social and scientific skills, enables them to be active and saves them from memorizing knowledge. Teachers generally have positive attitudes towards the student centered education.

Perception of Weaknesses was written by considering the research findings of Kalender (2006) and Sezen, Konur and Çimer (2018).

Perception of Opportunities: The items under this domain have been derived from the consideration of the possibility and infrastructure of a private school. According to Salman (2006) and Sezen, Konur and Çimer (2009), lack of infrastructure, lack of instructional material, tool and technology, and lack of teacher knowledge about student-centered instruction were the threats of implementation. On the other hand, a private school provides all the infrastructure, materials, and technology to teachers. Therefore items indicated below can be accepted as the opportunities to implement student-centered instruction.

Perception of Threats: Studies of Kalender (2006); Salman (2006); Sezen, Konur, and Çimer (2018); Şadoğlu, Akdeniz (2015) indicated that issues such as the time spent on achievement tests exceeding the amount of time spent on experimental activities, and, the inability of instructors reduce the effectiveness of the 5E instructional model. Class size, seating arrangements, lack of instructional material and school's physical conditions and placement exams were also the preventive factors of student-centered education.

3.6.3. Validity and Reliability

The study included several steps in confirming validity and reliability. For the validity of the study, first, the items were subject to content validity by consulting field experts in the area and then the construct validity, and ultimately, the final scale was subject to face validity. For the reliability analysis, Cronbach Coefficient measures were calculated. Each as explained respectively.

Content validity is whether the questionnaire or scale adequately contains all or part of the content (Balcı & Ahi, 2015). One of the best methods for determining the content validity is to obtain expert opinion on the content and format control of the scale (Fraenkel, Wallen and Hyun, 2015). The items of the scale used in this study were written as a result of a literature review, i.e. the items were determined to represent the variables to be measured. These items were then presented to the field experts. A professor from the curriculum and instruction department and measurement and evaluation specialists examined the scale and eliminated the items they deemed inappropriate, incomprehensible and out of scope. For face validity, an expert opinion was taken to check whether the items in the scale are related to the research topic. As a result, seven of sixty-five items were removed according to the recommendations and a 58-item scale was obtained.

Construct validity was enhanced through exploratory factor analysis by extracting the items into four clusters theoretically depends on SWOT dimensions. As a result of factor analysis, eight items were also removed from the scale and the ultimate reliability of the scale was calculated. The Cronbach Alpha Reliability Coefficient value for TPSCIM was found to be .92, which was a satisfactory result. The reliability coefficients of the strengths, weaknesses, opportunities, and threats factors were .94, .84, .80, and .76, respectively. For De Vellis (2012), reliability coefficients above .7 are acceptable, and reliability coefficients above .8 are ideal.

Table 3.2

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.919	.936	50

Table 3.3

Reliability Statistics of Dimensions

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Strengths	.94	.945	23
Weaknesses	.84	.844	12
Opportunities	.80	.816	9
Threats	.76	.758	6

3.7.Data Collection Procedures

At first, permission from the METU Ethics Council to conduct the survey was taken before the data collection. (see Appendix B). When the necessary confirmation was provided, the survey questionnaire was administered by the researcher in a private school. Data was collected in the 2018-2019 academic year between the 11th of March and the 26th of April. The researcher was the only person who administered the survey and collected data. Thus, the threat to internal validity, location can be controlled by the researcher. Location is a threat that can occur if data is collected in place that may affect responses (Freankel, Wallenand Hyun, 2015). So, in this study, participants answered the questionnaire in similar places, which were the research and development department and the teachers' room. There was only one data collector who was the researcher herself; therefore, the data collector factor was not an internal validity threat.

The consent form was provided to teachers (see Appendix C). Then the researcher gave a detailed explanation about the purpose of the survey and scale for volunteer teachers. As there was not a standard time for all teachers to participate simultaneously, they answered the scale in their free time one by one or as small groups.

3.8. Data Analysis Procedures

Initially, the collected data were scanned in case of having or incorrect parts. There was no wrong or missing data because all scales were checked immediately after data collection.

Collected data were analyzed using quantitative data analysis procedures. The responses of participants were entered into the SPSS METU version 20.0.

Firstly the Exploratory Factor Analysis was carried out to ensure reliability. EFA was also used to explore the teachers' perceptions of using the student-centered instructional model. A four-factor solution was created to make a SWOT analysis.

Secondly, the total perception scores of the scale and perceptions scores of each factor were calculated to use future statistical analysis.

Thirdly, tests of normality, which were Kolmogorov Smirnov and Shapiro-Wilk were conducted to check the normality of data distribution.

Finally, Independent sample t-Test and ANOVA tests were performed to examine the relationship between teachers' perceptions and variables such as gender, age, experience, academic degree, faculty, the field of teaching, and student-centered instructional model using status.

3.9. Researcher's Reflection

I have been working as a program development assistant for two years in the school development directorate of a private education institution. One of the job descriptions here is to guide teachers in planning their lessons and to exchange ideas with them about what the appropriate methods and techniques might be and how to make the instructional process more efficient. An instructional model called 2BM was developed by program development assistants who worked before me at this school. All teachers working in the school are expected to plan and conduct their lessons according to this model. As program development assistants, we monitor

teachers' planning processes, give feedback, and try to ensure that lessons are conducted following the instructional model. We also work in coordination with the measurement and evaluation department to ensure that the measurement and assessment tools in the process are structured by following instructional model steps.

In line with the inferences I have gained from experience and my personal observations during the process, I decided to do this study. I have observed that many teachers from all ages, levels, and branches have difficulty in preparing lesson plans according to the student-centered instructional model, and they have even regarded this process as an unnecessary workload. They had both a lack of knowledge and prejudices about writing lesson plans and using a student-centered instructional model since they had never been involved in such a process before and were more accustomed to conducting lessons based on teacher narration. As I was trying to convince teachers of the necessity and importance of the process, I questioned myself about what they perceived about this process. I wondered if they had more different perceptions than what we were trying to explain. Consequently, I decided to conduct this study.

At the beginning of the study, I had worries about whether teachers misunderstood me, or they avoided giving objective answers to the questionnaire. So, in order for those teachers not to feel as if they were being judged or evaluated, I meticulously explained my research process and the purpose of the research before applying the questionnaire. I took into consideration the voluntary participation of the teachers. I assured them that their names would not appear and that all responses would be protected confidentially.

I was happy to be able to conduct the research and collect data about a job I was actively involved in. Because, as a result of my work I think that I have gained information which can be useful for the institution I worked at, for teachers, and also for other private schools.

3.10. Limitations

This study is limited in the sense that the data were collected from a single private school. Thus, findings are only generalized among K-12 teachers working in a particular private school and teachers using the 2BM student-centered instructional model.

This study is limited to revealing teachers' perceptions about using a student-centered instructional model called 2BM. It will not be sufficient to elicit perceptions of other student-centered instructional models but provides opportunities to raise awareness on how student-centered instructional models may be views by different teacher populations. Especially, taken into consideration that this study is related to perceptions of the 2BM, which is mostly similar to the 5E instructional model.

CHAPTER 4

RESULTS

This study aimed to explore the perceptions of teachers working in a private school in Ankara about using a student-centered instructional model. A SWOT analysis was conducted based on the teachers' perceptions; in this way, the strengths, weaknesses, opportunities, and threats of the student-centered instructional model were examined.

This chapter presents the results of exploratory factor analysis, results of independent sample t-tests and ANOVA tests which were used to analyze quantitative data and inferences of an open-ended question.

4.1. Exploratory Factor Analysis

This study aims to summarize the perceptions of teachers about using a student-centered instructional model under the determinant dimensions via a perception scale developed by the researcher. Therefore, an exploratory factor analysis technique was found appropriate in this study. By using exploratory FA, the related variables are grouped and the data is explained and summarized; besides, it does not matter whether these variables are selected or not considering the underlying potential processes (Tabachnick & Fidell, 2013).

Fifty-eight items of the scale for teacher perceptions toward using the student-centered instructional model were subjected to the analysis of the principal components by using SPSS 20.0. Before conducting the factor analysis, the suitability of the data for factor analysis was evaluated. The Kaiser-Meyer-Olkin value was .74, which exceeded the recommended .6 value and the Barlett Test reached statistical significance ($p = .000$). These results support that the correlation matrix can be divided into factors. As this study was aimed to make a SWOT

analysis, a four-factor solution was made. The four-factor solution explained 45.3% of the variance. The contribution of the factors to the total variance was 25.6%, 9%, 5%, and 4%, respectively. Figure 4.1 revealed the scree test of a four-factor solution.
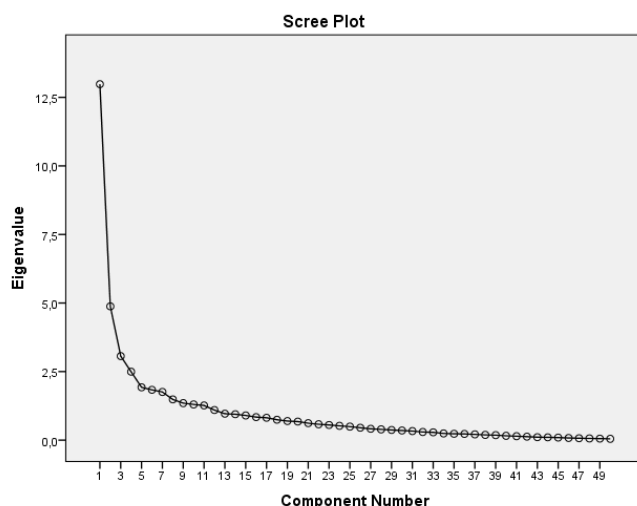
Figure 4.1. *Scree Test for Four Factor Solution*

Varimax rotation was carried for the interpretation of the components. As a result of the rotation, items loaded with a close value difference, which is less than .1 and loaded in multiple factors were checked. Item 43 was loaded in three different factors, item 51 was not loaded in any of the factors, and items 14,16,26,29,49 and 50 were loaded in two different factors with similar values. Therefore they were removed from the scale. Factor loadings of items according to a four-factor solution are presented in Table 4.1

Table 4.1

Factor Loadings of Items in Strengths, Weakness, Opportunities, and Threats

Item	Component			
	1 Strengths	2 Weakness	3 Opportunities	4 Threats
ps22	**,791**			
ps42	**,726**			
ps40	**,724**			
ps15	**,718**			
ps41	**,708**			
ps36	**,706**			
ps30	**,697**			
ps33	**,692**		,372	
ps11	**,674**			
ps21	**,669**			
ps34	**,655**		,329	
ps47	**,646**			
ps52	**,641**			
ps27	**,634**			
ps31	**,626**		,430	
ps10	**,622**			
ps58	**,615**			
ps6	**,604**			
ps2	**,600**			
ps35	**,579**		,482	
ps5	**,546**		,374	
ps20	**,517**			
ps1	**,509**			
R_ps39		**,770**		
R_ps38		**,758**		
R_ps37		**,692**		
R_ps4		**,643**		
R_ps32		**,618**		
R_ps17		**,609**		
R_ps8		**,592**		
R_ps48		**,588**		
R_ps9		**,501**		
R_ps3		**,490**		
R_ps45		**,396**		
R_ps23		**,384**		
ps56			**,712**	
ps25			**,646**	
ps19	,443		**,634**	
ps18	,333		**,627**	
ps57			**,623**	
ps24			**,577**	

Table 4.1 *(continued)*

Item	Component			
	1	2	3	4
	Strengths	Weakness	Opportunities	Threats
ps7			**,464**	
ps12			**,436**	
R_ps13			**,396**	
R_ps55				**,766**
R_ps54				**,715**
R_ps46				**,692**
R_ps28				**,556**
R_ps44				**,478**
R_ps53				**,446**

As a result of the second Varimax rotation after removal of the items, the items were distributed to the factors in the expected sub-dimensions. Kaiser-Meyer-Olkin value increased to .77. For proper factor analysis, Kaiser's measure of sampling adequacy must be higher than .60 (Tabachnick and Fidell, 2001). The four-component solution explained 46.8% of the variance and the contribution of the factors to the total variance was 25.9%, 9.7%, 6.1% ve 4.9%, respectively. Factor 1 named as strengths, factor 2 named as weaknesses, factor 3 named as opportunities and factor 4 named as threats. Eigenvalues, Percentages of Variance, and Cumulative Percentages for Factors of TPSCIM is given in table 4.2

Table 4.2

Eigenvalues, Percentages of Variance, and Cumulative Percentages for Factors of TPSCIM

Factor	Eigenvalue	% of Variance	Cumulative %
1	12.98	25.9	25.9
2	4.87	9.7	35.7
3	3.06	6.1	41.8
4	2.50	4.9	46.8

4.1.1.Descriptive Statistics for the Scale

The first research question of the study aims to elucidate the perceptions of teachers towards using a student-centered instructional model under four main dimensions which are strengths, weaknesses, opportunities and threats. As a result of the exploratory factor analysis teachers' perceptions were specified. Additionally, descriptive statistics of the scale were explained in detail to see the maximum value, minimum value, mean score and standard deviation of each item under the dimensions. Descriptive Statistics for Items in TPSCIM were given in Table 4.3.

Table 4.3

Descriptive Statistics for Items in TPSCIM (N=100)

	Min	Max	M	SD
Factor 1- Strengths			**4.34**	**.44**
ps1	1	5	4.41	.67
ps2	2.0	5.0	4.28	.71
ps5	2	5	4.47	.72
ps6	1	5	4.34	.71
ps10	2	5	4.41	.59
ps11	2	5	4.44	.67
ps15	3	5	4.36	.61
ps20	3	5	4.57	.55
ps21	2	5	4.25	.72
ps22	3	5	4.46	.58
ps27	3	5	4.14	.65
ps30	1	5	4.39	.69
ps31	1	5	4.30	.70
ps33	2	5	4.20	.62
ps34	2	5	4.26	.64
ps35	3	5	4.18	.67
ps36	3	5	4.45	.54
ps40	3	5	4.34	.61
ps41	2	5	4.30	.72
ps42	3	5	4.22	.71
ps47	3	5	4.30	.56
ps52	3	5	4.29	.59
ps58	3	5	4.43	.57
Factor 2- Weakness			**3.37**	**.91**
R_ps3	1	5	2.90	1.15
R_ps4	1	5	3.16	1.10
R_ps8	1	5	2.90	1.11

Table 4.3 *(Continued)*

	Min	*Max*	*M*	*SD*
Factor 2- Weaknesses				
R_ps9	1	5	4.01	1.12
R_ps17	1	5	3.10	.98
R_ps23	1	5	2.82	1.25
R_ps32	1	5	3.33	1.02
R_ps37	1	5	3.33	1.02
R_ps38	1	5	3.32	.95
R_ps39	1	5	3.49	.99
R_ps45	1	5	4.20	.87
R_ps48	1	5	3.87	.92
Factor3-Opportunities			**3.90**	**.67**
ps7	1	5	4.04	.90
ps12	1	5	4.12	.81
R_ps13	1	5	3.31	1.06
ps18	2	5	3.97	.66
ps19	2	5	3.99	.73
ps24	2	5	4.12	.80
ps25	2	5	4.09	.71
ps56	1	5	3.70	.88
ps57	1	5	3.72	.95
Factor 4- Threats			**2.86**	**.86**
R_ps28	1	5	2.27	1.08
R_ps44	1	5	3.55	1.05
R_ps46	1	5	2.75	1.11
R_ps53	1	5	2.79	.96
R_ps54	1	5	3.01	1.01
R_ps55	1	5	2.77	1.08

As can be seen in Table 4.3. the smallest minimum score was one and the maximum score was 5. The mean values of the items ranged between 2.27 and 4.57. The item with the lowest mean value was that 'The objectives of the student-centered teaching model do not match the structure of national tests' (*M*=2.27, *SD*=1.08). This item was under the dimension of threats so it can be inferred that the element that teachers think the most threatens the implementation of the student-centered instructional model was the national exams. The item with the highest mean value was that 'Student-centered instructional model increases the permanence of the knowledge' (*M*=4.57, *SD*=.55). Most of the teachers perceived this statement as the strength of using the student-centered instructional model. According to the teachers'

perceptions, the highest mean value of the dimension of weaknesses represents the item that 'Using a student-centered teaching model is a waste of time' (*M*=4.20, *SD*=.88). Finally, the two items with same mean value under the dimension of opportunities were that 'There are units in which the teacher can get support in the course planning process according to the teaching model (*M*=4.12, *SD*=.81) and 'The physical infrastructure of the school allows students to be taught according to the student-centered teaching model (*M*=4.12, *SD*=.80).

4.2. Testing Assumptions for T-test and ANOVA

Independent sample t-test and ANOVA test were carried out to answer the second research question which is "Do teachers' perceptions about using student-centered instructional models change according to the following characteristics: gender, age, total teaching experience, highest degree gained, faculty of graduation, field of teaching, and student-centered instructional model using status?"

4.2.1. Assumptions for Independent Sample t-test

The first independent samples t-test was carried out to compare the strengths, weaknesses, opportunities, and threats perception scores for the student-centered instructional model according to the gender of the participants. Assumptions of the independent sample t-test were :

> 1. There was not a significant difference in the scores of females (*M*=101,45, *SD*=9,64) and males (*M*=96,56, *SD*=10,17) ; *t* (98)=2.36, *p* = 0.020 in terms of their perception of strength.

> 2. There was not a significant difference in the scores of females (*M*=40,68, *SD*=7,37) and males (*M*=39,94, *SD*=7,94); *t* (98)=.46, *p* =.64 in terms of their perception of weakness.

> 3. There was a significant difference in the scores of females (*M*=35,98, *SD*=3,94) and males (*M*=33,26, *SD*=5,56) ; *t* (50,5)=2.54, *p* =.014 in terms of their perception of opportunities. Women have higher perceptions of the

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opportunities they have when using a student-centered instructional model than men.

4. There was not a significant difference in the scores of females (M=17.18, SD=4.35) and males (M=17.06, SD=4.08); t (98)=.14, p =.89 in terms of their perception of weakness.

Table 4.4

T-Test for Comparison of Perception Levels of Women and Men

	Gender	N	M	SD	t	df	p
Strengths	Female	66	101,45	9,646	2.36	98	0.020
	Male	34	96,56	10,172			
Weakness	Female	66	40,68	7,370	.46	98	.64
	Male	34	39,94	7,943			
Opportunities	Female	66	35,98	3,940	2.54	50.5	.014
	Male	34	33,26	5,567			
Threats	Female	66	17,18	4,353	.14	98	.89
	Male	34	17,06	4,082			

The second independent samples t-test was carried out to compare the strengths, weaknesses, opportunities, and threats perception scores for the student-centered instructional model according to the student-centered instructional model using the status of the participants. Assumptions of the independent sample t-test were :

1. There **was a significant difference** in the scores of participants who used to use a student-centered instructional model before (M=101.51, SD=9.5) and participants who did not use a student-centered instructional model before

(M=94.04, SD=9.8); t (35)=3.20, p =.003 in terms of their perception of strengths.

2. There was not a significant difference in the scores of participants who used to use student-centered instructional model before (M=41.23, SD=7.6) and participants who did not use student-centered instructional model before (M=37.74, SD=6.8); t (98)=1.98, p =.051 in terms of their perception of weakness.

3. There was not a significant difference in the scores of participants who used to use a student-centered instructional model before (M=34.83, SD=4.75) and participants who did not use a student-centered instructional model before (M=35.83, SD=4.57); t (98)=.88, p =.37 in terms of their perception of opportunity.

4. There **was a significant difference** in the scores of participants who used to use a student-centered instructional model before (M=17.71, SD=4.32) and participants who did not use a student-centered instructional model before (M=15.22, SD=3.37); t (45.76)=2.91, p =.006 in terms of their perception of threats.

Table 4.5

T-Test for Comparison of Perception Levels According to Student-Centered Instructional Model Using Status

	Status	*N*	*M*	*SD*	*t*	*df*	*p*
Strengths	Yes	77	101,51	9,504	3.206	35.059	.003
	No	23	94,04	9,883			
Weakness	Yes	77	41,23	7,603	1.98	98	.051
	No	23	37,74	6,790			
Opportunities	Yes	77	34,83	4,758	.888	98	.377
	No	23	35,83	4,569			
Threats	Yes	77	17,71	4,325	2.909	45.76	.006
	No	23	15,22	3,370			

Specifically, results suggested that teachers who previously used student-centered instructional model have a higher perception of strength than teachers who did not use a student-centered instructional model before. Similarly, teachers who used a student-centered instructional model previously had a higher perception of threats than those who did not.

4.2.2. Assumptions for ANOVA

One-Way ANOVA test was conducted to examine the effect of age on teacher perceptions as measured by the scale for teacher perceptions toward using the student-centered instructional model. The participants were divided into five groups according to their ages. There was no statistically significant difference in the perception scores of strengths, weaknesses, opportunities and threats dimensions for

these five age groups at p <.05 level. Table 4.6 summarizes the result of the ANOVA test.

Table 4.6

The One Way ANOVA Table for Differentiation of Teachers' Perception Levels According to Age

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	655,6	4	163,9	1,6	,164
Strengts	Within Groups	9344,9	95	98,3		
	Total	10000,6	99			
	Between Groups	236,14	4	59,03	1,04	,390
Weakness	Within Groups	5388,3	95	56,7		
	Total	5624,5	99			
	Between Groups	121,3	4	30,3	1,3	,244
Opportunities	Within Groups	2076,2	95			
	Total	2197,6	99			
	Between Groups	41,6	4	10,4	,56	,686
Threats	Within Groups	1740,3	95	18,3		
	Total	1782,04	99			

One-Way ANOVA test was conducted to examine the effect of experience on teacher perceptions as measured by the scale for teacher perceptions toward using the student-centered instructional model. The participants were divided into five-year groups according to experience. There was no statistically significant difference in the perception scores of strengths, weaknesses, opportunities, and threats dimensions for these five year ranges at p <.05 level. Table 4.7 summarizes the result of ANOVA test.

Table 4.7

The One Way ANOVA Table for Differentiation of Teachers' Perception Levels According to Experience

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Strengts	Between Groups	284,0	4	71	,69	,598
	Within Groups	9716,5	95	102,2		
	Total	10000,5	99			
Weakness	Between Groups	209,2	4	52,3	,92	,457
	Within Groups	5415,3	95	57		
	Total	5624,5	99			
Opportunities	Between Groups	46,8	4	11,7	,52	,723
	Within Groups	2150,7	95	22,6		
	Total	2197,6	99			
Threats	Between Groups	112,47	4	28,1	1,6	,181
	Within Groups	1669,5	95	17,5		
	Total	1782,0	99			

One-Way ANOVA test was conducted to examine the effect of academic degree on teacher perceptions as measured by the scale for teacher perceptions toward using the student-centered instructional model. There was no statistically significant difference in the perception scores of strengths, weaknesses, opportunities, and threats dimensions for the highest degree, which are undergraduate, master and doctorate at p <.05 level. Table 4.8 summarizes the result of the ANOVA test for the highest degree gained.

Table 4.8

The One Way ANOVA Table for Differentiation of Teachers' Perception Levels According to Academic Degree

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	49,2	1	49,2	,485	,48
Strengts	Within Groups	9951,3	98	101,5		
	Total	10000,5	99			
	Between Groups	150,5	1	150,5	2,696	,10
Weakness	Within Groups	5473,9	98	55,8		
	Total	5624,5	99			
	Between Groups	2,8	1	2,8	,129	,72
Opportunities	Within Groups	2194,7	98	22,3		
	Total	2197,6	99			
	Between Groups	3,3	1	3,3	,182	,67
Threats	Within Groups	1778,7	98	18,1		
	Total	1782	99			

One-Way ANOVA test was conducted to examine the effect of faculty of graduation on teacher perceptions as measured by the scale for teacher perceptions toward using the student-centered instructional model. There was no statistically significant difference in the perception scores of strengths, weaknesses, opportunities and threats dimensions for faculty of graduation which are education faculty, science and arts faculty and other faculties at p <.05 level. Table 4.9 summarizes the result of ANOVA test for the faculty of graduation.

Table 4.9

The One Way ANOVA Table for Differentiation of Teachers' Perception Levels According to the Faculty of Graduation

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Strengts	Between Groups	109,7	2	54,8	,538	,58
	Within Groups	9890,8	97	101,9		
	Total	10000,6	99			
Weakness	Between Groups	66,1	2	33,0	,577	,56
	Within Groups	5558,4	97	57,3		
	Total	5624,5	99			
Opportunities	Between Groups	45,6	2	22,8	1,029	,36
	Within Groups	2151	97	22,2		
	Total	2197,6	99			
Threats	Between Groups	21,5	2	10,7	,592	,5
	Within Groups	1760,5	97	18,2		
	Total	1782,0	99			

One-Way ANOVA test was conducted to examine the effect of the field of teaching on teacher perceptions as measured by the scale for teacher perceptions toward using the student-centered instructional model. There was a statistically significant difference in the perception scores of threats dimension for the field of teaching which are elementary, Turkish, maths, science, social science, applied courses and foreign languages at $p < .05$ level. $F_{(6,93)} = 2.5, p = .025$. The effect size calculated using eta square was found to be .14. According to Cohen (1988), this is big effect size. Post-hoc comparisons using the Tukey HSD test showed that the mean score of science teachers ($M = 14.80, SD = 3.7$) was significantly different from the mean score of foreign language teachers ($M = 19.50, SD = 3.2$). Table 4.10 summarizes the result of ANOVA test for the field of teaching.

Table 4.10

The One Way ANOVA Table for Differentiation of Teachers' Perception Levels According to Field of Teaching

ANOVA

		Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
Strengts	Between Groups	671,3	6	111,9	1,115	,36
	Within Groups	9329,3	93	100,3		
	Total	10000,6	99			
Weakness	Between Groups	410,1	6	68,3	1,219	,3
	Within Groups	5214,3	93	56,07		
	Total	5624,5	99			
Opportunities	Between Groups	137,3	6	22,8	1,033	,41
	Within Groups	2060,3	93	22,1		
	Total	2197,6	99			
Threats	Between Groups	252,3	6	42,04	2,556	,02
	Within Groups	1529,8	93	16,45		
	Total	1782,0	99			

4.3. Open-Ended Question for Additional Comments of Teachers

At the end of the scale, teachers were asked with an open-ended question whether they had a different opinion or suggestion about strengths, weaknesses, opportunities, and threats of the student-centered instructional model as distinct from the items given in the scale. The SWOT analysis framework was used for descriptive analysis of data. The opinions of the teachers were read carefully, and the keywords were determined. In order to identify the keywords, the SWOT subscale of them was interpreted. Finally, the overall findings of the open-ended question were interpreted. Nine participants wrote their opinions in this section, and two of the answers were not included because they were irrelevant. Table 4.11 summarizes the answers of the participant under the related dimension.

Table 4.11

Teachers' views on a student-centered instructional model

	Strengths	Weakness	Opportunity	Threats	Suggestions
Participant 4					In-service training
Participant 27		Preparation time		Teacher's knowledge and skill Classroom management problems	
Participant 33				National examination system	
Participant 42				Students' cognitive, social and affective preparedness level	
Participant 46					Parent involvement
Participant 81				Social activities at school	
Participant 87					In-service training and workshops

The answers given by the teachers to the open-ended question coincided with some of the items on the scale. To summarize:

- Lesson planning with the instructional model is a time-consuming task for the teacher.
- Teachers' lack of knowledge and skills about student-centered education and course planning is a threat to implementing the student-centered instructional model.

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- Classroom management problems negatively affect the use of the student-centered instructional model.
- The national examination system is a threat to student-centered education.
- Students' insufficient cognitive, social, and affective preparedness level threatens the effectiveness of the student-centered instructional model.
- The high number of extracurricular social activities in school prevents the use of the student-centered instructional model.

Teachers' suggestions for the improvement of the process were as follows:

- In-service training and workshops should be given to improve the perception and skills of teachers toward using a student-centered instructional model.
- Parents should be involved in the instructional process.

4.4. Summary of the Study

The purpose of this study was to explore the perceptions of K-12 teachers' towards using a 2BM instructional model in a private school context by employing a survey design. A researcher-based instrument was developed that included items to conduct a SWOT Analysis aiming to find out the strengths, weaknesses, opportunities, and threats of using a student-centered instructional model according to teachers' perceptions was developed. The scale was conducted to 100 teachers who were the primary school, secondary school, and high school teachers of a private school in Ankara, Çayyolu district.

Exploratory factor analysis (EFA) was performed to determine the factors in the scale. As a result of four-factor solution strengths, weaknesses, opportunities, and threats dimensions were found out. Independent samples t-test revealed that female teachers have higher perceptions of the opportunities they have when using a student-centered instructional model than male teachers do. Independent samples t-test also suggested that teachers who previously used student-centered instructional model have a higher perception of strengths and threats than teachers who did not use a student-centered instructional model before. One-Way ANOVA test was

conducted to examine the effect of age, experience, academic degree, faculty, and field of teaching on teacher perceptions. The results indicated that the perception level of the foreign language teachers towards the threats regarding student-centered education was higher than the science teachers.

CHAPTER 5

DISCUSSION

This chapter aims to compare and discuss the findings of the study with previous researches. Firstly, a summary of the study is provided, and then the results of the research are discussed in two sections. In the first section, teachers' perceptions about using a student-centered instructional model are summarized, and in the second section, the examination of these perceptions according to various variables is examined. Finally, implications for further research and practice are given.

5.1. Teachers' Perceptions toward Using 2BM Instructional Model

The first question of the study was to find out the perceptions of teachers towards using a 2BM instructional model. A swot analysis was conducted via utilizing a scale revealing teachers' perceptions of a student-centered 2BM instructional in terms of strengths, weaknesses, opportunities, and threats to find out the multidimensional answer to this question. In the following parts, perceptions under these dimensions are mentioned, respectively.

5.1.1. Strengths of Using 2BM Instructional Model

The first subquestion of the study was as follows: 'What are the perceptions of teachers about the strengths of using the 2BM instructional model?' According to the answers given by teachers, there were similarities between teachers' perceptions of the strengths that emerged as a result of exploratory factor analysis and the findings of the studies in the literature regarding the student-centered education and 5E instructional model. Similar to the studies of Duncan and Buskirk-Cohen (2011); İlter and Ünal (2014); Özsevgeç (2006); Sezen, Konur, and Çimer (2009), teacher perceptions underlined that the student-centered instructional model increases

students' motivation and interest in the lesson. Another positive characteristic of using instructional model according to İlter and Ünal (2014) and Konur and Çimer (2009), which investigated the effectiveness of the 5E instructional model, also coincided with the teachers' perceptions of strengths. For these perceptions, using a student-centered instructional model makes the teaching and learning process enjoyable, allows students to learn by living and doing, supports the social and mental development of the students, and increases the students' ability to use teaching tools and equipment.

One of the teachers' perceptions that using a student-centered instructional model improves students' communication and language skills coincides with the results of the study in which Özdemir and Balkan (2017) investigated the effect of the 5E instructional model on language skills. Besides, the study of Akcan (2018) that investigated the classroom teachers' views on the implementation of student-centered instruction also revealed that using a student-centered instructional model strengthens the communication between students.

Likewise, Omotayo and Adeleke (2017) investigated the contribution of the 5E instructional model to the outcomes of the mathematics course, and they found that the 5E instructional model improved students' learning outcomes. Similarly, teachers in this study have positive perceptions about the 2BM instructional model's improving and diversifying students' learning outcomes.

Several studies suggested that student-centered education and instructional models improved students' high-level thinking skills such as conceptual understanding, critical thinking, problem-solving, and scientific thinking. In their research, Bybee et al.,(2006); Özdemir and Balkan (2017); Sevinç (2008); showed that the 5E instructional model was effective in acquiring these skills. Also, using a student-centered instructional model improved the students' high-level thinking skills according to the perceptions of teachers in this study.

Finally, the teachers who participated in this research stated that students can produce original ideas and have the opportunity to share them thanks to the student-

centered instructional model. Besides, teachers have the perception that the instructional model contributes to creating a democratic classroom environment. Similarly, Akcan (2018) and Arend (2009) states that student-centered instructional environments support classroom democracy.

The student-centered instructional model using the status of teachers caused differentiation in the perception of strengths toward using a student-centered instructional model. It was revealed that the teachers who planned their courses according to a student-centered instructional model in their previous work perceived the strengths of the instructional model.

5.1.2. Weaknesses of Using 2BM Instructional Model

The weaknesses regarding using the 2BM instructional model emerged as a result of the teachers' perceptions. There are similarities between the results of Sezen, Konur, and Çimer's (2009) study aiming to evaluate science and technology applications based on the 5E instructional model for prospective classroom teachers in perceptions. For example, teachers have perceptions that planning lessons according to a model, following the steps of this model sequentially and structuring student-centered assessment such as portfolio and project, were challenging. They also think that classroom management problems can increase because the teacher's authority in the classroom decreases when the student-centered instructional model is used.

Zophy (1982), in his article examining student-centered education, stated that teachers had the idea that student-centered instruction increased their workload. Although many years have passed since this article, it is clear that teachers can still see student-centered education as a workload. Also, in this study, it was revealed that teachers have perceptions in this direction. Teachers also stated in the additional opinion part at the end of the scale that the lesson planning according to the instructional model needs long preparation time so they have a perception of weakness about using student-centered instructional model.

One of the findings of Kalender's (2006) thesis study examining the difficulties faced by classroom teachers in the implementation of constructivism based on mathematics curriculum is that students do not have adequate readiness for student-centered education. Similarly, the teachers in this study underlined that they would have difficulty in conducting courses according to the student-centered instructional model because students did not have cognitive and affective preparedness for student-centered instructional activities.

5.1.3. Opportunities for Using 2BM Instructional Model

The findings of the study revealed that teachers' were aware of the opportunities they have by using the 2BM instructional model. Teachers' perceptions were consistent with the results of the preliminary interviews conducted during the scale preparation process. According to those interviews, teachers can get support from the curriculum specialists of the school in the course planning process and from the school principal for providing various instructional material and tools.

Teachers' perceptions emerged that using a student-centered instructional model enabled teachers to identify and eliminate misconceptions of students. Çoruhlu (2013) and Salman (2006) also investigated the reflections of the 5E instructional model and a constructivist approach to science and biology education, and they found that the model was effective in eliminating students' misconceptions.

Also, it was revealed that teachers had the opportunity to establish problem-based learning environments in the process they used the model. Arends (2009), mentioned that student-centered instructional models provide problem-based learning environments.

In line with the purpose of the second research question, whether variables such as gender, age, experience, academic degree, faculty, a field of teaching, student-centered instructional model using status caused differentiation in perceptions were also investigated. The findings revealed that gender only led to differentiation in perceptions about opportunities. Female teachers had more perceptions of

opportunities in the process of implementing a student-centered instructional model than men teachers. According to the research report of TEDMEM (2014), which is "Teaching Profession in terms of Teachers Perspectives,"; female teachers' professional perception scores are higher than male teachers, so female teachers perceive their profession more positively. Karaman (2008) investigated the Teachers' Forms of Perception of Their Job and identified that female teachers' perception of the profession and their expectations from the future were more favorable than male teachers. According to these results, it can be inferred that female teachers with higher professional perceptions may perceive better the opportunities which they have in the teaching process than men.

5.1.4. Threats for Using 2BM Instructional Model

Teachers' perception of threats that they have in implementing the 2BM instructional model indicated that the examination system in Turkey was one of the primary threats that prevented the use of student-centered instructional model because students desired to take exam-oriented courses, especially in the year when they would take the exam, and they did not demand student-centered activities. Likewise, there is a perception that there are many exams in the school to prepare students for the exam and that this can prevent class activities. Similarly, Altınyelken (2001) underlined that the structure of the exams for student selection at high school and university entrance does not coincide with student-centered instructional pedagogy. Accordingly, he stated that the teachers planned their lessons to be more exam-oriented and to solve questions. In the BSCS Report (2006), exam preparations are mentioned to be able to prevent the implementation of the 5E instructional model. It can be deduced from here that schools in different parts of the world also offer exam-oriented instruction rather than student-centered instruction.

Altınyelken (2011); Kalender (2006); Sezen, Konur, and Çimer (2009), stated that the high number of students in the classes adversely affected student-centered educational practices. Similarly, the teachers in this study had the perception that the

classes were crowded for student-centered education, although it was a private school, and the average class sizes were 12-14.

Finally, there was a perception that the duration of the course was short of applying the steps of the 2BM instructional model. Similar results were found by Salman (2006) in his study on the constructivist approach and Bozdoğan and Altunçekiç (2007) in the study on the usability of the 5E instructional model.

The student-centered instructional model using status of teachers caused differentiation in the perception of threats toward using a 2BM instructional model. The results indicated that the teachers who planned their courses according to a student-centered instructional model in their previous experience perceived the strengths of the elements that threatened the implementation of the instructional process.

Teachers' age, experience, academic degree, and faculty they graduated from did not cause any difference in their perceptions toward using a student-centered instructional model. However, there is a differentiation in the dimension of the perceived threat according to their field of teaching. It was found that the perception level of the foreign language teachers towards the threats was higher than the science teachers. Similar to this result; İlter and Ünal (2014) and Yörük, Günbayı, Günbayı, and Orhon (2017) investigated the problems which English language teachers faced within the teaching process and explained that crowdedness of classrooms and insufficient class hours of English lessons were seen as problems of English teachers. Şanli (2015) also stated that the full class sizes negatively affect the instructional process of the English course. Although class size is a general problem of public schools that adversely affect the teaching and learning process, private school teachers have also complained about class size. It can be inferred that smaller groups may be appropriate for language teaching.

5.2. Implications for Practice

In this section, some suggestions are given to implement the 2BM instructional model more qualified based on the results of the research. The focus of the recommendations is on teachers' perceptions of the weaknesses and threats of using a student-centered instructional model. Accordingly, it is crucial to consider these practical recommendations in order to minimize the situations perceived as unfavorable by teachers. Although the study was conducted in a private school, these recommendations should be taken into account by every teacher and educator because the findings are similar to the results of previous studies in public schools and universities.

According to the teachers' perceptions of the weaknesses of using a student-centered instructional model, it is difficult to apply the steps of it in sequence, and planning a lesson according to a model increases their workload, so they are reluctant to use an instructional model. Even though student-centered instruction and its applications are theoretically learned in teacher education programs with several courses, teachers usually put it in the background in their professional life. In education faculties, prospective teachers may not be subjected to student-centered learning environments enough and this may hinder them from adopting such an approach in adapting it into their practices. Therefore, it may be beneficial for schools to cooperate with universities and get academic support in order to refresh teachers' knowledge about student-centered instruction and do authentic practices on planning and teaching for student-centered learning environments.

Similarly, although teachers can obtain the technical information they need to develop assessment tools such as portfolio, rubric, rating scales, performance evaluation from measurement and evaluation experts in the school they stated that assessment tools that they are expected to develop while using the student-centered instructional model were challenging for them. So, precautions should be taken to increase the quality of their cooperation.

Besides, it is necessary to employ measurement and evaluation experts in schools to train teachers to develop student-centered assignment tools. One of the teachers' perceptions is that the use of a student-centered instructional model causes classroom management problems and weakens the authority of the teacher. There may be a lack of knowledge and application errors about teachers' classroom management in a student-centered approach. Teacher educations, both in-service and pre-service, need to give attention to helping teachers build skills in classroom management and communication with students. As an additional suggestion, teacher training could be carried out in cooperation with guidance and psychological counseling units if there is one in the school setting.

Teachers' perceptions put forward that the level of readiness of the students for student-centered instruction is insufficient, and this makes the implementation of the instructional model weak. At this point, the teachers should make efforts to increase the readiness of the students. Mainly, through short-term or long-term in-service training programs in schools could be organized for the teachers about the theoretical dimension and applications of implementing student-centered learning environments such as implementing constructivist learning in K-12 classrooms. Teachers' regular and systematic use of student-centered instruction from kindergarten to high school will enable students to become accustomed to such learning so they can have a cognitive and affective preparedness.

Another perception of teachers indicated that the national placement exams in Turkey affect the instructional methods and techniques of teachers because it has become the goal of all private schools to prepare students for the exam and ensure that they make high clearances in the tests. As a result, teachers plan their lessons in the form of resolving tests and lecturing. It is, therefore, no surprise that teachers perceive the exam system as an obstacle to using a student-centered instructional model. In addition to the multiple-choice tests, organizing student placement exams to test multiple skills will create a requirement for student-centered instruction in the learning and teaching process. In this way, student-centered instructional models can be used to develop these skills in teaching and learning processes.

Finally, a significant difference was found between the perceptions of foreign language teachers and science teachers towards threats. Foreign language teachers have higher perceptions of threats than science teachers, so foreign language teachers should be supported more in the planning process in order to eliminate their negative perceptions about using a student-centered teaching model.

5.3. Suggestions for Further Research

Within the scope of this study, perceptions of teachers working in a private school on using the student-centered instructional model were evaluated based on a SWOT analysis scale. There are some suggestions for further researches to develop this study.

Firstly, by including different private schools in this study, perceptions about different instructional models can be revealed, and these instructional models can be compared. In this way, researchers can have a broader perspective on how student-centered education is implemented in private school concept and have a more extensive understanding of which instructional models are used in private schools.

Secondly, The SWOT analysis can be repeated by using the qualitative research method, and the result can be compared to this study. Qualitative research may provide more intensive data and the insights of different stakeholders such as teachers, administrators and the students' views as well.

Next, foreign language teachers felt more threatened compared with science teachers towards using the 2BM model. This finding may imply that teachers with different teaching credentials, especially a foreign language, should be closely monitored or supervised in using the 2BM model in the particular school setting through action studies. Also, it should be further explored whether the 2BM model is suitable for use in social science or language classes. In particular, case studies can be conducted to investigate problems and action studies can be done to reduce problems.

Finally, to evaluate the use and effectiveness of the student-centered instructional model in a private school, the study can be expanded by investigating students'

perceptions or attitudes towards the courses taught by using a student-centered instructional model in public schools given that the class sizes and the physical contexts or resources available may vary. As students are important stakeholders in the learning process, perceptions or attitudes of them related to student-centered education will be most useful to meet their educational needs and improve classroom practices.

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APPENDICES

RANDOMLY SELECTED ITEMS BY DIMENSION

ÖĞRETMENLERİN ÖĞRENCİ MERKEZLİ ÖĞRETİM MODELİ KULLANMA ALGILARI

Değerli meslektaşlarım;

ODTÜ Eğitim Programları ve Öğretimi Bölümü yüksek lisans tez çalışması kapsamında yürütülen bu araştırmanın amacı özel bir okulda görev yapan tüm seviye ve branştaki öğretmenlerin öğrenci merkezli öğretim modeli kullanmaya yönelik algı düzeylerini belirlemektir. Sizin değerli katkılarınızla bu okulda ders planlamak için kullanılan öğretim modeliyle ile ilgili güçlü yönler ve iyileştirilmesi gereken yönler belirlenecektir. Bundan dolayı tüm soruları içtenlikle yanıtlamanız önemlidir.

Kullanılacak algı ölçeği 58 adet maddeden oluşmaktadır. Anketin cevaplanma süresi ortalama 5 dakikadır.

Yanıtlar sadece akademik amaçla kullanılacak olup kişisel bilgileriniz gizli tutulacaktır.

Katılımınız ve katkılarınız için teşekkür ederim.

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1.BÖLÜM-KİŞİSEL BİLGİLER

Bu bölümde kişisel bilgilerinize yönelik sorular bulunmaktadır. Size uygun olan yanıtı kutuları işaretleyerek belirtiniz.

Cinsiyetiniz: ☐ Kadın ☐ Erkek

Yaşınız: ☐21-25 ☐26-30 ☐31-35 ☐36-40 ☐40 yaş ve üzeri

Kaç yıldır öğretmenlik yapıyorsunuz : ☐1-5 ☐6-10 ☐11-15 ☐16-20 ☐21 yıl ve üzeri

Son mezun olduğunuz derece: ☐Ön Lisans ☐Lisans ☐Yüksek Lisans ☐Doktora

Mezun olduğununuz lisans programı:

☐Eğitim Fakültesi ☐Fen –Edebiyat Fakültesi ☐Diğer

Branşınız: ☐İlkokul ☐Matematik ☐Fen bilimleri ☐Sosyal bilimler

☐Türkçe ☐Uygulamalı dersler ☐Yabancı dil

Dersine/derslerine girdiğiniz sınıf seviyesi: ☐1-4 ☐5-8 ☐9-12 (Birden çok seçenek işaretleyebilirsiniz.)

Daha önce çalıştığınız eğitim kurumları:

☐Dershane ☐Temel lise ☐Özel okul ☐Devlet okulu ☐Yükseköğretim ☐Yok

Daha önce öğrenci merkezli herhangi bir öğretim modeli kullandınız mı?

☐Evet ☐Hayır

2. BÖLÜM: ÖĞRENCİ MERKEZLİ ÖĞRETİM MODELİ KULLANMA ALGI ÖLÇEĞİ

Aşağıdaki maddelerde, **öğrenci merkezli öğretim modeli kullanmaya** yönelik görüşleriniz alınacaktır. Lütfen tüm maddeleri dikkatle okuyarak ilgili maddelere katılma derecenizi ifadelerin karşısındaki bölüme (X) işareti koyarak belirtiniz. Katılma derecelerine ait nicel ifadeler aşağıdaki gibidir.

1-Kesinlikle katılmıyorum
2-Katılmıyorum
3-Kararsızım
4-Katılıyorum
5-Kesinlikle Katılıyorum

F1	**Madde 1**	**Öğrenciyi öğrenmeye motive eder.**
	Madde 2	Öğrenciyi bilimsel araştırmaya yönlendirir.
	Madde 5	Öğrencinin yaparak-yaşayarak öğrenmesini sağlar.
	Madde 6	Öğrencinin zihinsel gelişimini sağlar.
	Madde 10	Öğrencinin sosyal gelişimini destekler.
	Madde 11	Öğretim sürecini keyifli hale getirir.
	Madde 15	Öğrencinin araç-gereç kullanım becerisini artırır.
	Madde 20	Bilginin kalıcılığını artırır.
	Madde 21	Öğrencinin derse yönelik olumlu davranış sergilemesini sağlar.
	Madde 22	Öğrencilerin iletişim becerisini artırır.
	Madde 27	Öğrencilerin dil becerilerini geliştirmelerine olanak sağlar.
	Madde 30	Öğrencinin derse olan ilgisini artırır.
	Madde 31	Öğrencinin öğrenme çıktılarını geliştirir.
	Madde 33	Öğrencinin kavramsal anlama becerisini geliştirir
	Madde 34	Öğrencinin bilimsel süreç becerilerini geliştirir.
	Madde 35	Öğrencinin dersteki akademik başarısını artırır.
	Madde 40	Öğrencilerin eleştirel düşünme becerisini artırır.
	Madde 41	Öğrencilerde öğrenmeye karşı sorumluluğu artırır.
	Madde 42	Demokratik sınıf ortamı oluşmasını sağlar.
	Madde 47	Öğrencilerin problem çözme becerilerini geliştirir.
	Madde 52	Öğrencilerin bilimsel muhakeme becerisini artırır.
	Madde 58	Öğrencinin özgün fikirlerini paylaşmasına olanak sağlar.
F2	**Madde 3**	Öğrenci merkezli değerlendirme süreçlerini (portfolyo, proje, gözlem formu vb.) yapılandırmak öğretmen için zorlayıcıdır.
	Madde 4	Dersi modele göre planlamak zorlayıcıdır.

	Madde 8	Sınıf yönetimi sorunları öğretim modelinin uygulanmasını engeller.
	Madde 9	Öğrenci merkezli öğretim modeli kullanmak öğretmenin otoritesini azaltır.
	Madde 17	Öğretim modelinin basamaklarını sıralı uygulamak zorlayıcıdır.
	Madde 23	Öğretmenin iş yükünü artırır.
	Madde 32	Grup çalışmalarını yönetmek öğretmen için zorlayıcıdır.
	Madde 45	Öğrenci merkezli öğretim modeli kullanmak zaman kaybıdır.
	Madde 48	Öğrenciler öğrenci merkezli öğretimi ciddiye almaz.
F3	**Madde 7**	Okul yönetimi öğretmeni öğrenci merkezli öğretim modelini uygulayabilmesi için destekler.
	Madde 12	Öğretmenin modele göre ders planlama sürecinde destek alabileceği birimler vardır.
	Madde 13	Öğrenci merkezli etkinlikler için gerekli materyal ve malzemeler kolay ulaşılabilir değildir.
	Madde 18	Öğrencilerin kavram yanılgılarının tespit edilmesinde etkilidir.
	Madde 19	Öğrencilerin kavram yanılgılarının giderilmesinde etkilidir.
	Madde 24	Okulun fiziksel altyapısı öğrenci-merkezli öğretim yapılmasına olanak sağlar.
	Madde 25	Probleme dayalı öğrenme ortamları kurulmasına olanak sağlar.
	Madde 56	Proje tabanlı öğrenme etkinliklerini yürütmesi için gerekli olanaklar öğretmene sağlanır.
	Madde 57	Öğrenci merkezli öğretimi uygulamak için ders materyalleri okul tarafından yeterli miktarda temin edilir.
F4	**Madde 28**	Öğrenci merkezli öğretim modelinin amaçlarıyla ulusal sınavların yapısı uyuşmamaktadır.
	Madde 44	Sınıfların mevcudu öğrenci merkezli öğretim için uygun değildir.
	Madde 46	Ders başına ayrılan haftalık ders saati öğrenci merkezli öğretim modeli uygulamak için yetersizdir.
	Madde 53	Öğretmenler öğrenci-merkezli öğretim modeli kullanma konusunda çekimserdir.
	Madde 54	Okuldaki ölçme araçlarının uygulanmasına ayrılan süre öğrenci merkezli eğitim etkinliklerini engeller.
	Madde 55	Öğrenci merkezli öğretimi uygulamak için ders süreleri yetersizdir.

B. METU ETHICS COMMITTEE APPROVAL

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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06 MART 2019

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Doç.Dr. Hanife AKAR

Danışmanlığını yaptığınız Ezgi DOĞANAY'ın **"Özel Bir Kurumda K-12 Öğretmenlerinin Öğrenci Merkezli Öğretim Modeli Kullanma Algı Düzeylerinin Belirlenmesi"** başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve **093-ODTÜ-2019** protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

Prof. Dr. Tülin GENÇÖZ
Başkan

Prof. Dr. Ayhan SOL
Üye

Prof. Dr. Ayhan Gürbüz DEMİR (4.)
Üye

Prof. Dr. Yaşar KONDAKÇI
Üye

Doç. Dr. Emre SELÇUK
Üye

Doç. Dr. Pınar KAYGAN
Üye

Dr. Öğr. Üyesi Ali Emre TURGUT
Üye

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C. CONSENT FORM FOR PARTICIPANTS

ARAŞTIRMAYA GÖNÜLLÜ KATILIM FORMU

Bu araştırma, ODTÜ Eğitim Programları ve Öğretim Bölümü Yüksek Lisans öğrencisi Ezgi DOĞANAY tarafından Prof. Dr. Hanife AKAR danışmanlığındaki yüksek lisans tezi kapsamında yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Araştırmanın amacı, özel okulda çalışan K-12 öğretmenlerinin öğrenci merkezli öğretim modeli kullanmaya yönelik algı düzeylerini ortaya çıkarmaktır.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırmaya katılmayı kabul ederseniz, sizden 50 maddelik Öğrenci Merkezli Öğretim Modeli Kullanma Algı Ölçeğini cevaplamanız beklenecektir.

Sizden Topladığımız Bilgileri Nasıl Kullanacağız?

Araştırmaya katılımınız tamamen gönüllülük temelinde olmalıdır. Çalışmada sizden kimlik belirleyici hiçbir bilgi istenmemektedir. Cevaplarınız tamamıyla gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir.

Katılımınızla ilgili bilmeniz gerekenler:

Cevaplayacağınız ölçek genel olarak kişisel rahatsızlık verecek sorular veya uygulamalar içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz çalışmayı yarıda bırakmakta serbestsiniz. Böyle bir durumda çalışmayı uygulayan kişiye çalışmayı bırakmak istediğinizi söylemek yeterli olacaktır.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Çalışma sonunda, çalışmayla ilgili sorularınız cevaplanacaktır. Katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için ODTÜ Eğitim Programları ve Öğretim Bölümü öğretim üyelerinden Prof. Dr. Hanife AKAR (E-posta: hanif@metu.edu.tr) ya da yüksek lisans öğrencisi Ezgi DOĞANAY (E-posta: ezgidoganay89@gmail.com) ile iletişim kurabilirsiniz.

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.

(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyad   Tarih   İmza

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

D. TIMELINE OF THE STUDY

	September-November 2018	December-February 2018-2019	March-April 2019	May-June 2019	July-August 2019	September-January 2019-2020
1. Literature Review	X	X	X	X		
2. Preparation of the survey scale		X				
3. METU Ethics Committee Approval			X			
4. Implementing a pilot study			X			
5. Data collection			X	X		
6. Data analysis				X	X	
7. Write-up			X	X	X	X

ÖZEL BİR KURUMDA K-12 ÖĞRETMENLERİNİN BAKIŞ AÇISINDAN
ÖĞRENCİ MERKEZLİ ÖĞRETİM MODELİ KULLANMAYA YÖNELİK
ALGILARIN İNCELENMESİ ÜZERİNE BİR ÇALIŞMA

Giriş

Araştırmanın Amacı ve Önemi

Dünyanın hızla küreselleşmesi ve teknolojideki gelişmelerle birlikte geleneksel eğitim yaklaşımı yerini bireylerin beceri ve değer gelişimlerini temel alan öğrenci merkezli eğitim pedagojilerine bırakmaya başlamıştır. Freire (1998) geleneksel ve öğretmen merkezli eğitimi öğrencileri pratik yapmaktan çok ezbere alıştırmakla, yaratıcılık ve düşünme becerilerini kısıtlamayla eleştirmiştir ve bu eğitim yaklaşımının yerini bireyin özelliklerini temel alan öğrenci merkezli eğitimin alması gerektiğini belirtmiştir. Öğrenci merkezli eğitim, öğrenenin aktif olduğu, yaşam deneyimlerini ön plana çıkaran ve üst düzey düşünme becerisini geliştirmeye yönelik bir yaklaşımdır. Öğrenci merkezli eğitim yaklaşımlarının amacı; çağdaş bilgi ve donanıma sahip bireyler yetiştirmektir çünkü ancak bu sayede uluslararası değer ve farkındalığa sahip nesiller oluşabilir. (Akınoğlu,2005). Eğitimde, öğrenci merkezli öğretimi tercih etmenin bilişsel, psikolojik ve ekonomik olarak farklı nedenleri olabilir (Gilia, 2016). Örneğin öğrenci merkezli öğretim bireylerin üst düzey düşünme becerilerini geliştirir, insan sermayesinin gelişmesini sağlar ve demokrasi bilincini artırır.

Öğrenci merkezli eğitim yaklaşımını örgün eğitimde planlanabilir kılmak için çeşitli öğrenci merkezli öğretim modelleri tasarlanmıştır. Robert Bybee tarafından tasarlanan 5E modeli de alanyazına geçmiş öğretim modellerinden biridir. Bybee (1997), öğrenmenin öğrencinin zihinsel olarak gerçekleştirdiği bir eylem olarak tanımlamıştır. 5E öğrenme modelinde öğrencilerin bilgiyi zihinsel olarak

yapılandırmasını sağlayacak giriş, keşfetme, açıklama, derinleştirme ve değerlendirme olmak üzere beş basamak vardır.

5E öğrenme modeli birçok farklı derste kullanılmış ve etkililiği araştırmalara konu olmuştur. 5E öğrenme modelinin teorik çerçevesini temel alan başka modeller de tasarlanmıştır. Bu çalışmaya konu olan 2BM öğrenme modeli de özel bir okulda çalışan eğitim uzmanları tarafından 5E modelini örnek alarak tasarlanmış bir öğrenme modelidir. 2BM modeli de 5E modeli gibi öğrencilerin bilgiyi yapılandırarak öğrenmesini sağlayan ve sıralı olarak işlenmesi gereken öğretim basamaklarına sahiptir. 5E modelinden farkı ise ana basamakların arasında standartlaştırılmış değerlendirme basamaklarına sahip olması ayrıca yaşamsal deneyimler bütünleştirme ve ürün-çıktı gibi iki farklı basamağın daha öğretim sürecine dâhil edilmiş olmasıdır.

Öğrenci merkezli öğretim modellerinin tasarlanması ve kullanılması kadar öğretimi ne kadar iyileştirdiği ve öğrencileri geliştirdiği de önemlidir. Bu bağlamda ülkemizde özellikle öğrenci merkezli ve yapılandırmacı olarak nitelenen öğretim programlarının yayınlandığı 2004-2005 eğitim-öğretim yılından günümüze, hem öğrenci merkezli eğitim yaklaşımı hem de 5E öğretim modeli üzerine birçok araştırma yapılmıştır. Bu araştırmaların sonuçları öğrenci gelişimi lehine genellikle olumludur. Öte yandan okulların altyapı ve donanım eksikliği, öğretim araç gereç ve materyallerinin yetersiz olması, sınıf mevcutlarının yüksek olması, öğretmenlerin uygulamaya yönelik bilgi ve deneyim eksikliği, liselere ve üniversitelere giriş sınavlarının öğretim sürecini aksatması başlıca problemlerdir (Kalender, 2006; Korkut, 2006; Sevinç, 2008; Saydam, 2009; Altinyelken, 2011; Ahmed, 2013; Mancır, 2014; Akcan, 2018; Erdem, 2018).

Bu çalışmada, alanyazındaki araştırmalardan farklı olarak öğrenci merkezli öğretim modeli kullanımı konusu bir özel okul kapsamında ele alınmıştır. Özel okullar öğrenci merkezli ve çağın gereklerine uygun öğretim yapmayı vadeden geniş olanaklara sahip kurumlardır. Son yıllarda ise kendi geliştirdikleri öğrenme modelleri ile öğrenci merkezli öğretim uygulamaları yapmaktadırlar. Öğrenci merkezli eğitim

yaklaşımının ve öğretim modellerinin özel okul kapsamında nasıl kullanıldığına dair ise alanyazında çalışma yoktur. Bu çalışma için geliştirilen SWOT analizi ölçeği ile özel okulda çalışan K-12 öğretmenlerinin 2BM öğretim modelini kullanmaya yönelik güçlülük, zayıflık, fırsatlar ve tehditler boyutlarında algıları ortaya çıkarılacaktır. Dolayısıyla bu çalışma alanyazına hem bir SWOT ölçeği kazandırmak hem de özel okul öğretmenleri ile yapılmış olması bakımından katkı sağlayacaktır. Öğrenci merkezli eğitim ve öğretim ile ilgili özel bir okulda araştırmak yapmak Türkiye'de her geçen gün eğitimdeki payı artan özel okullarda öğrenci merkezli eğitimin nasıl algılandığı ile ilgili önemli veriler sağlayacaktır. MEB (2019), 2023 vizyon belgesinde de özel okullardaki öğrenci merkezli eğitim uygulamalarını niteliği artırmaya yönelik çalışmalar yapılacağını ve okulların belirli kalite standartlarına çekileceğini açıklamıştır. Önümüzdeki yıllarda öğrenci merkezli öğretime olan ihtiyacın artması ve öğrenci merkezli öğretim modellerinin kullanımının yaygınlaşması beklenmektedir çünkü öğrenciler öğrendikleri bilgi, beceri, tutum ve değerleri harmanlayarak ; yeni değerler yaratmak, sorumluluk almak ve gerginlik ve ikilemleri uzlaştırmak gibi yeterliliklere ulaşmalıdır (OECD, 2018). OECD'nin geliştirilmesini beklediği ve altını çizdiği beceri ve yeterlilikler ise öğrenci merkezli öğrenme ortamları ve öğretim modelleri ile mümkün olabilir. Öğretmenler, öğrenci merkezli öğretim modellerini kullanmada önemli role sahiptir bu nedenle, öğretmenlerin öğrenci merkezli bir öğretim modeli kullanma hakkındaki algılarını belirlemek önemlidir.

Araştırma Soruları

1. Öğretmenlerin öğrenci merkezli 2BM öğretim modelini kullanma algıları nelerdir ?

     1.1.Öğretmenlerin modeli kullanmanın güçlü yönlerine yönelik algıları nelerdir ?

     1.2.Öğretmenlerin modeli kullanmanın zayıf yönlerine yönelik algıları nelerdir?

1.3.Öğretmenlerin modeli kullanma sürecinde sahip oldukları fırsatlara yönelik algıları nelerdir?

1.4.Öğretmenlerin modeli kullanma süreçlerini tehdit eden unsurlara yönelik algıları nelerdir?

2. Öğretmenlerin 2BM öğrenme modelini kullanmaya yönelik algıları '*cinsiyet,yaş, deneyim, mezun olunan derece, mezun olunan fakülte, brans, daha önce öğrenci merkezli öğretim modeli kullanma durumu'* değişkenlerine göre anlamlı bir farklılık gösterir mi?

Literatür Taraması

Öğrenci merkezli öğretim öğrencilerin bireysel farklılıkları ve öğrenme özellikleri göz önünde bulundurularak öğretim sürecinin tasarlanmasıdır (McCombs & Whisler, 1997). Öğrenci merkezli öğretimin kullanıldığı sınıflarda öğrenciler yaparak-yaşayarak öğretim sürecinde aktif katılım gösterirler, öğrenci ve öğretmen öğretim sürecinde eşit role sahip paydaşlardır (Prawat, 1992). Öğrenci merkezli öğretimde öğrenciler bilgiyi neden ve nasıl öğreneceklerinin seçimlerini yapabilirler (Burnard, 1999). Hoidn'e (2017) göre öğrenci merkezli öğretim ortamlarını tasarlamak için bazı ilkelerin göz önünde bulundurulması gerekir. Öncelikle ders içeriği öğrencilerin kavramsal anlama becerilerini geliştirecek şekilde düzenlenmelidir. Öğrenme aktiviteleri öğrencilerin ön bilgilerini harekete geçirmeli ve dikkatlerini çekmelidir. Öğrenciler işbirlikli çalışma gruplarına katılmaları için desteklenmeli ve yansıtıcı etkinlikler yapmaları sağlanmalıdır. Öğrenme süreci basamak basamak ilerlemeli ve öğrenme durumu düzenli olarak değerlendirilerek geri bildirim sağlanmalıdır. Ayrıca öğrencilerin öz değerlendirme ve akran değerlendirmesi yapması sağlanmalıdır.

Nonkukhethong, B. Baldauf Jr, ve Moni (2006) öğrenci merkezli öğretimin yaşamboyu öğrenme yaklaşımını da kapsadığını ifade etmiştir. Öğrenci merkezli öğretim ile öğrenciler yaşam boyu ihtiyaç duyacakları yaratıcılık, eleştirel düşünme, iletişim gibi becerileri kazanabilirler.

Reigeluth (2012) öğrenci merkezli öğretimin odağının öğretim süreci olması gerektiğini ve bu süreçte öğretmenin değil öğrencinin aktif olması gerektiğini belirtmiştir. Ayrıca öğretimin bireyselleştirilmesi, süreç değerlendirmesi, takım çalışması, akran öğrenme ve yaşam boyu öğrenme gibi kavramların öğrenci merkezli eğitim süreciyle sıkı bir ilişkisi olduğunun altını çizmiştir.

Öğrenci merkezli öğretim modelleri de öğrenci merkezli öğrenme süreçlerini düzenlemek ve planlamak için kullanılan belirli bir kuramsal teoriye dayanan modellerdir. 5E öğrenme modeli de Robert Bybee tarafından 80'lerin sonuna doğru fen bilimleri dersleri kullanılmak üzere geliştirilmiş beş basamaklı bir öğrenme modelidir. 5E öğrenme modelinin öğretim sürecinde ve öğrenmedeki etkililiğini araştıran pek çok araştırma yapılmıştır. Coulson (2002)'nin araştırmasının sonucuna göre derslerini 5E öğrenme modeline göre planlayan ve yürüten öğretmenlerin sınıflarının 5E öğrenme modeli kullanmayan öğretmenlerin sınıflarına göre daha başarılı olduğu görülmüştür. Türkiye'de 5E öğrenme modeli ile ilgili yapılan çalışmalarda ise 5E öğrenme modelinin öğrencilerin kavramsal anlama, bilimsel düşünme gibi becerilerini geliştirdiğini, öğrencilerin akademik başarılarını artırdığı, derse yönelik tutum ve motivasyonu pozitif yönde değiştirdiği, ders devamsızlığını azalttığı ve öğrencilerin kavram yanılgılarını gidermede etkili olduğu sonuçları elde edilmiştir (Sevinç, 2008; Çoruhlu, 2013; İlter ve Ünal, 2014; Anıl and Batdı, 2015; Hassan, 2015; Çeliksoy, 2017). Öte yandan araştırmalar 5E öğretim modeli kullanmaya yönelik problemleri de ortaya koymuştur. Bu problemlerin başlıcaları, materyal eksikliği, zaman sınırlaması, sınıf mevcutlarının yüksek olması ve öğretmenlerin modeli uygulamaya yönelik bilgi ve tecrübe eksikliği olmasıdır.

Yöntem

Desen

Çalışmanın temel amacı, özel bir okulda, ilkokul, ortaokul ve lise seviyelerinde görev yapan öğretmenlerin okulda kullanılmakta olan 2BM öğrenci merkezli öğretim modelini kullanmaya yönelik algılarını belirlemektir. Belirli bir grubun mevcut tutum, görüş, algı veya inançları hakkında bilgi toplamayı sağladığı için kesitsel

tarama araştırma deseni kullanılmıştır (Creswell, 2012). Bu çalışmada, araştırmacı tarafından "Öğrenci Merkezli Öğretim Modeli Kullanma Algı Ölçeği"geliştirilmiş ve Ankara'da bir özel okulda çalışan 100 öğretmenden veri toplanmıştır.

Örneklem

Araştırmanın hedef evrenini, Ankara'daki bir özel okulda ilkokul, ortaokul ve lise seviyelerinde görev yapan sınıf öğretmenleri, Türkçe, matematik, sosyal bilimler, fen bilimleri, yabancı dil ve branş öğretmenleri oluşturmaktadır (N=109). Bu çalışmada okuldaki bütün öğretmenlerin katılım sağlaması hedeflendiği için örnekleme yapılmamıştır. Okuldaki öğretmenlerden 100 tanesi (N=100) çalışmaya gönüllü olarak katılmış ve algı ölçeğini cevaplamıştır.

Veri Toplama Aracı

Öğrenci Merkezli Öğretim Modeli Kullanma Algı Ölçeği (TPSCIM) araştırmacı tarafından öğretmenlerin öğrenci merkezli öğretim modeli kullanmaya yönelik algılarını belirlemek için geliştirilmiş bir veri toplama aracıdır. Ölçek üç bölümden oluşmaktadır. İlk bölümde öğretmenlerin demografik bilgilerini öğrenmeye yönelik sorular vardır. İkinci bölümde öğretmenlerin algılarını belirlemeye yönelik 50 adet 5'li likert tipte yazılmış kapalı uçlu madde bulunmaktadır. Kapalı uçlu maddelerde öğretmenlerin "Kesinlikle katılıyorum" ve "kesinlikle katılmıyorum" maddeleri arasında değişen beş puan aralığında cevaplar vermeleri beklenmektedir. Son bölümde ise öğretmenlerin eklemek istedikleri görüş ve yorumlarını paylaşmaları için isteğe bağlı cevaplayacakları açık uçlu bir soru verilmiştir.

Veri toplama sürecine geçilmeden önce ölçeğin geçerlik ve güvenirliğini yordamak amacıyla pilot çalışma yapılmıştır. Toplanan veri setine SPSS 20 ODTÜ Versiyonu kullanılarak açımlayıcı faktör analizi yapılmış ve güvenirlik katsayısı hesaplanmıştır. Analiz sonucuna göre güvenirlik katsayısı .94 olarak belirlenmiştir. Yine faktör analizi ile yapılan Varimax döndürme analizi sonucunda bazı maddeler elenerek madde sayısı 58'den 50'ye düşürülmüştür.

Veri Toplama Süreci

Veri toplama sürecine geçilmeden önce ODTÜ İnsan Araştırmaları Etik Kurulu'ndan ve çalışmanın yapılacağı özel okuldan gerekli izinler alınmıştır. Mart 2019'da önce pilot çalışma yapılmış ardından da ana veri toplanmıştır. Veri toplama sürecinde öğretmenler araştırmanın amacı ve kapsamı hakkında bilgilendirilmiş ve gönüllü katılmak isteyen öğretmenlere Gönüllü Katılım Formu imzalattırılmıştır. Ölçeğin cevaplama süresi yaklaşık 15 dakika olarak belirtilmiştir.

Veri Analizi

Pilot uygulama ve ana çalışma sonrası toplanan verilerin istatistiği IBM SPSS 20 ODTÜ Versiyonu kullanılarak yapılmıştır. Pilot çalışma sonrası verilere açımlayıcı faktör analizi yapılmıştır. Ana çalışma sonrasında da yine faktör analizi yapılmış ve araştırmaya yönelik alt boyutlara son şekli verilmiştir. Ortaya çıkan boyutlara yönelik betimsel istatistikler yapılmış ve ortalama ve standart sapma değerleri hesaplanmıştır.

Araştırma sorularının yanıtlarını belirleyebilmek için bağımsız örnekler t-testi ve tek yönlü varyans analizi yapılmıştır. Son olarak anketin sonunda bulunan ve isteğe bağlı olarak cevaplanan bölümdeki veriler içerik analizi yapılarak kodlanmış ve belirli temalar altında toplanmıştır.

Araştırmanın Sınırlılıkları

Bu araştırmadan elde edilen sonuçlar uygulandığı özel okulla ve bu okulda kullanılan 2BM öğrenci merkezli öğretim modeli ile sınırlı olup farklı özel okullar için genellenmemelidir.

Araştırmacının verinin toplandığı okulun bir çalışanı olması öğretmenlerin kaygılanmalarına çekimser cevap vermelerine neden olabilir. Bunun önüne geçebilmek adına araştırmacı kişisel bilgilerin korunacağı ve çalışmanın gizliliği ile ilgili katılımcıları bilgilendirmiştir.

Bulgular

Öğretmenlerin öğrenci merkezli öğretim modeli kullanmaya yönelik algılarını ortaya çıkarmaya amaçlayan birinci araştırma sorusuna yönelik yapılan faktör analizinden elde edilen bulgular öğretmenlerin algılarının güçlü yönler, zayıf yönler, fırsatlar ve tehditler boyutlarında ayrıştığını göstermiştir.

Öğretmenlerin algılarının cinsiyet ve daha önce öğrenci merkezli öğretim modeli kullanma durumu değişkenlerine göre farklılaşıp farklılaşmadığını belirlemek için bağımsız örneklemler t-testi yapılmıştır. Testin sonuçları kadın öğretmenlerin öğretim modelini kullanmaya yönelik fırsatlar boyutundaki algılarının erkek öğretmenlerden daha yüksek olduğunu göstermiştir. Yapılan ikinci bağımsız örneklemler t-testi ile önceki mesleki deneyimlerinde herhangi bir öğrenci merkezli öğretim modeli kullanan öğretmenlerin güçlü yönler ve zayıf yönler boyutlarına yönelik algılarının daha fazla olduğunu ortaya çıkarmıştır. Öğretmen algılarının yaş, deneyim, akademik derece, mezun olunan fakülte ve branşa göre durumunu belirlemek için yapılan tek yönlü varyans analizinin sonuçları , (ANOVA) yabancı dil grubu öğretmenlerinin tehdit boyutundaki algılarının fen bilimleri grubu öğretmenlerine göre daha fazla olduğunu göstermiştir.

Sonuç ve Öneriler

Sonuç

Öğretmenlerin öğretim modeli kullanmanın güçlü yanlarına yönelik algıları; öğrenci merkezli öğretim modeli kullanımının öğrencilerin motivasyonunu artırdığı, öğretim sürecini eğlenceli hale getirdiği, öğrencilerin dil ve iletişim becerilerini artırdığı, öğrenme çıktılarını geliştirdiği, kavramsal anlama, eleştirel düşünme, problem çözme, bilimsel düşünme gibi becerilerini geliştirdiği, öğrencilere kendini ifade etme fırsatı sağladığı ve demokratik sınıf ortamını geliştirdiği yönündedir. Bu araştırma sonucunda ortaya çıkan bulgular alan yazındaki diğer araştırmalarla da örtüşmektedir. (Akcan, 2018; Arends, 2009 ; BSCS, 2006; Duncan & Buskirk-

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Cohen, 2011; İlter&Ünal; Omotayo& Adeleke ,2017; Özdemir & Balkan, 2017; Sezen, Konur, & Çimer, 2009).

Öğretmenlerin öğrenci merkezli öğretim modelinin zayıf yönlerine yönelik algıları da alanyazın ile benzerlik göstermiştir. Öğretmenlere göre dersleri bir öğretim modeline göre planlamak ve modelin basamaklarını sıralı uygulamak zorlayıcıdır. Benzer şekilde öğrenci merkezli değerlendirme araçlarını yapılandırmanın da zorlayıcı olduğunu belirtmişlerdir. Öğretmenlerin öğrenci merkezli öğretim modeli kullanırken sınıf yönetimi problemleri yaşadıkları, öğrencilerin öğrenci merkezli öğretime bilişsel ve duyuşsal olarak hazır bulunmadıklarına yönelik de olumsuz algıları vardır (Kalender, 2006; Sezen, Konur, & Çimer, 2009; Zophy, 1982).

Öğretmenlerin öğrenci merkezli öğretim modeli kullanmanın fırsatlarına yönelik algıları ise öğretmenlerin destek birimler tarafından desteklendiği, okulun yeterli materyal ve fiziksel altyapıya sahip olduğu, öğretim modeli kullanımının öğrencilerin kavram yanılgılarını gidermede ve probleme dayalı öğretim ortamları kurma fırsatı yarattığı yönündedir. (Arends, 2009; Çoruhlu, 2013; Salman, 2006).

Son olarak öğretmenlerin öğrenci merkezli öğretim modeli kullanımını tehdit eden durumlara yönelik algıları belirlenmiştir. Türkiye'deki sınav odaklı eğitim sistemi, sınıf mevcutlarının yüksek olması, ders sürelerinin yetersiz olması gibi faktörlerin uygulamayı tehdit ettiği algısı mevcuttur (Altınyelken, 2001; Bozdoğan &Altunçekiç, 2007; BSCS, 2006; Kalender, 2006; Salman, 2006; Sezen, Konur, & Çimer, 2009) .

Uygulamaya Yönelik Öneriler

Öğretmenlerin öğrenci merkezli öğretim modeli kullanma becerilerini geliştirmek için özel okullar üniversitelerle işbirliği kurarak öğretmenlerin profesyonel gelişimini artıracak çalışmalar yapılabilir.

Öğrenci merkezli öğretim modeli kullanırken sınıfta oluşan iletişim problemleri gidermek için rehberlik birimiyle birlikte iletişim becerileri üzerine çalışmalar yürütülebilir.

Öğrencilerin öğrenci merkezli öğretime hazır bulunuşluk düzeylerini artırmak için öncelikle öğretmenlerin kendi bakış açılarını ve hazır bulunuşluklarını geliştirmeleri gerekir. Bu yüzden yükseköğretim kurumlarında öğretmen eğitimi programları daha uygulamaya yönelik bir yaklaşımla yapılandırılmalıdır.

Türkiye'de MEB ve ÖSYM'nin uyguladığı yerleştirme sınavlarının sadece bilgiyi ölçen soruların ötesinde öğrencilerin farklı bilişsel becerilerini de ölçecek düzeye getirilmesi gereklidir. Bu sayede okullar test çözme odaklı eğitimden daha öğrenci odaklı eğitime geçebilir.

Araştırmaya Yönelik Öneriler

Araştırma farklı öğrenci merkezli öğretim modeli kullanan diğer okullarda da uygulanıp, sonuçlar karşılaştırılabilir. Böylece özel okul kapsamında daha geniş bir bakış açısı elde edilebilir.

SWOT Analizi çalışması nitel araştırma yöntemiyle tekrar yapılabilir.

Çalışma öğretim sürecinin temel öznesi olan öğrencilere de uygulanarak öğrenci merkezli öğretim modeline yönelik daha geniş ve bütüncül bir bakış elde edilebilir.

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<u>**TEZİN ADI /**</u> <u>TITLE OF THE THESIS</u> (**İngilizce** / English) **: A STUDY ON INVESTIGATION OF USING A STUDENT CENTERED INSTRUCTIONAL MODEL FROM PERSPECTIVES OF K-12 TEACHERS IN A PRIVATE SCHOOL**

<u>**TEZİN TÜRÜ /**</u> <u>DEGREE</u>**: Yüksek Lisans** / Master ☒ **Doktora** / PhD ☐

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