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The Evaluation of Flipped Classroom Themed Master's Theses and Dissertations in Turkey between 2015 and 2020

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Abstract. This research is a case study examining postgraduate theses on flipped classrooms between 2015 and 2020. The universe of the research is postgraduate theses on flipped classrooms in Turkey. The sample consists of 21 dissertations and 62 master's theses, which were conducted between 2015-2020 within the scope of the purposeful sampling method and published in the YÖK National Thesis Center. The theses included in the study were subjected to document review with the measurement tool developed by Demirci, Arıkan, & Onuk in 2018. It is seen that the studies carried out include the steps that should be followed in a scientific research with a few exceptions. The most preferred research method in the method section of the theses was mixed method. When the sampling techniques of the studies are examined, it is seen that purposive sampling comes to the fore. Interviews and tests were mostly used as data collection tools. Although validity and reliability studies were carried out in the majority of theses, the number of theses that do not include those ones cannot be ignored. Most studies on the subject were conducted in 2019 and 2020. This shows us that the concept of flipped classrooms has started to attract the attention of researchers in recent years. As the integration of technology into education accelerates, the interest in technology-based applications such as flipped classrooms will continue to increase and this will show more reflections in academic research.

Keywords. Flipped classroom, evaluation, active learning.

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The 21st century skills that today's students need to be successful in their careers during the Information Age are listed as: critical thinking, creativity, collaboration, communication, information literacy, media literacy, technology literacy, flexibility, leadership, entrepreneurship, productivity and social skills (Rotherham & Willingham, 2010). There is a need for methods beyond traditional methods to gain these skills to students. It can be said that active learning (Torralba & Doo, 2020), which is a student-centred learning method that includes active participation through reading, writing or discussion, is a method that can be used to raise active individuals. One of the ways to put this method into practice is the Flipped Classroom activities.

Based on the idea of reversing the traditional teaching approach, flipped classrooms, which are defined as pulling in-class activities out of the classroom and out-of-class activities into the classroom (Lage, Platt, & Treglia, 2000; Tucker, 2012), have recently become one of the most frequently cited methods in the education world. The main purpose of flipped classrooms is to increase the quality of face-to-face education in the classroom by completely reversing the traditional method, leaving the part that includes high-level skills such as assimilation and permanence of knowledge into the classroom and the transfer of knowledge out of the classroom (Sams & Bergmann, 2013; Strayer, 2012; Charitable & Orhan, 2018). The approach in the emergence of flipped classrooms is based on the premise that "direct instruction is not effective and efficient teaching tools in the field of group learning, but are effective and efficient in the field of individual learning" (Bergmann & Sams, 2014; Sams & Bergmann, 2013). Thus, it proposes a modified way in which students study "classroom activities" at home and "homework" in the classroom. Students are asked to study various educational materials at home, mostly pre-recorded videos (González-Gómez & Jeong, 2020). During the time that students spend in the classroom, it is aimed to address certain questions or uncertainties through lectures or to participate in student-focused learning activities such as collaborative research tasks (Moraros at al., 2015; Mattis, 2015; O'Flaherty & Phillips, 2015; O'Grady at al., 2014).

To give an example of a typical flipped classroom practice, at home students watch pre-recorded video lectures by their teachers, take notes and come to class with questions prepared before the lesson. The classroom then becomes an environment that allows students to work through advanced concepts and learning problems. Teachers have the opportunity to devote more time to problem solving, advanced concepts and high-level meaning making activities in the face-to-face part of the lesson. Thus, teachers get the chance to work with students individually in a flipped classroom (Tucker, 2012). As a result, teachers have more time to provide students with

individualized learning feedback in a flipped classroom than in a classroom with a traditional teaching approach (Wei at al., 2020). *Figure 1* displays a sample flipped structure.

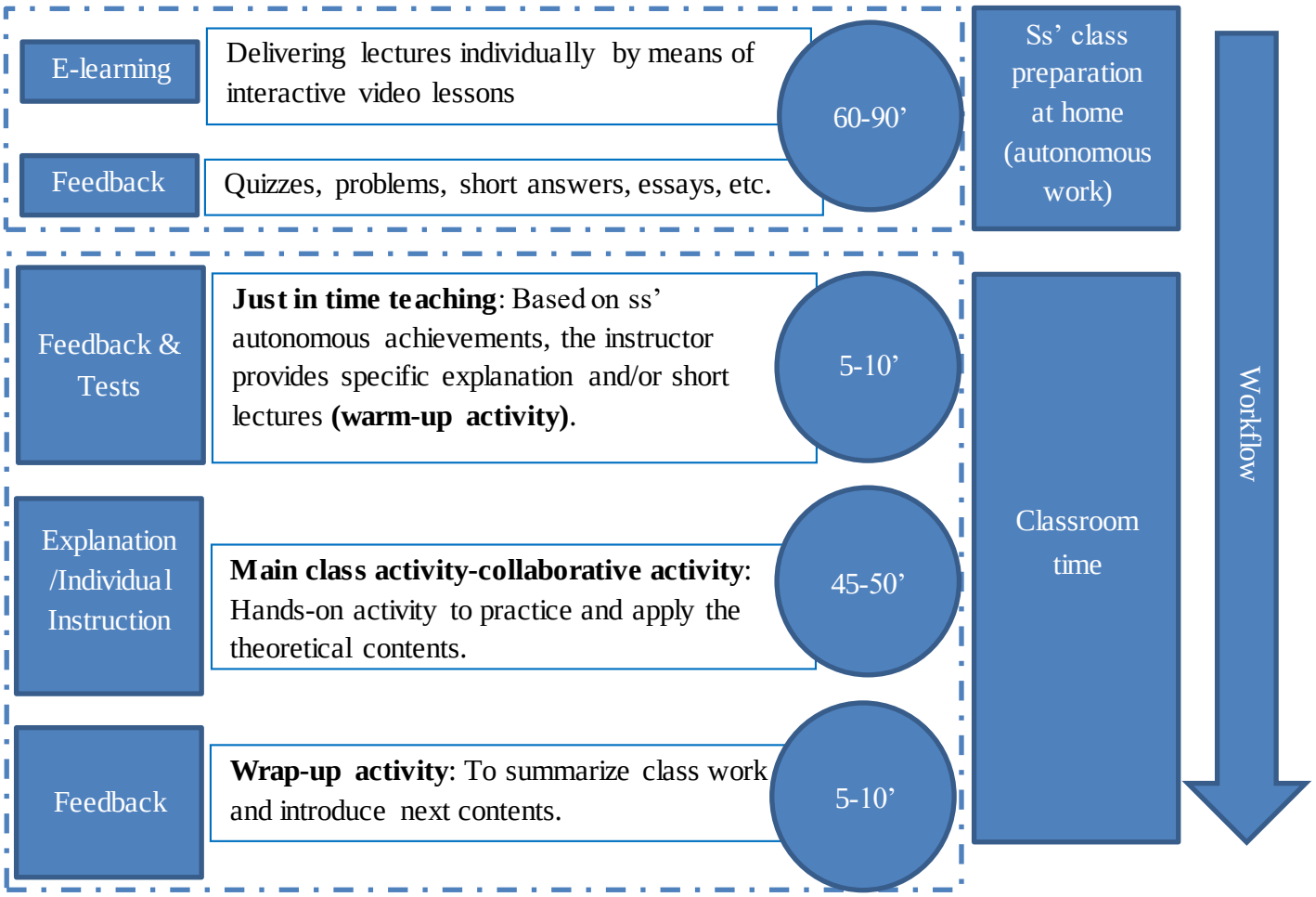

Figure 1. Flipped Classroom Structure (González-Gómez & Jeong, 2020, p. 543).

Studies have revealed that flipped classes have many advantages for both teachers and students (Kay et al., 2019). These include:

• Overall positive impact on learning (Frydenberg, 2013; Larson & Yamamoto, 2013; Lucke et al., 2013),

• Ease of accessing online multimedia resources from anywhere and at any time (Boucher, Robertson, Wainner & Sanders, 2013; Yeung & O'Malley 2014),

• Increase in self-confidence (Ferreri & O'Connor, 2013; McLaughlin et al., 2014; Pierce & Fox, 2012; Sales, 2013),

• Increase in class participation (Critz & Knight, 2013; Frydenberg, 2013; Lasry et al., 2014; Lucke et al., 2013; McLaughlin et al., 2014; Ryan, 2013),

• Increase in opportunities for teacher interaction (Lage, et al., 2000; Pierce & Fox 2012; Slomanson, 2014),

• Working with peers and sharing ideas in the classroom (Ferreri & O'Connor, 2013; Love et al., 2014; Ryan, 2013).

It also allows students to learn at their own pace as they can pause, rewind and replay the videos they watch before the lessons (Turan & Akdağ Çimen, 2019; Chen Hsieh et al., 2017; Yu & Wang, 2016). In addition, it can be claimed that doing homework in the classroom helps teachers identify students with learning difficulties and enables teachers to reveal students' development, interest and participation by using reporting method (Karadeniz, 2015; Fulton, 2012; Herreid & Schiller, 2013).

Another feature of flipped classrooms is that they help students who come to the classroom well-prepared to solve the difficulties in learning complex concepts (Roach, 2014). Student-centered, collaborative activities in classroom time are valued by students (Tomas et al., 2016). In addition, in the study conducted by Turan and Göktaş (2016), it was revealed that it contributes to academic success and reduces the cognitive load of students. As a result, flipped classrooms emerge as a method that embodies responsibility and accountability, encourages self-organizing and autonomous learners (González-Gómez & Jeong, 2020).

There are also criticisms of flipped classrooms in the literature. Flipping classrooms, an approach that challenges traditional methods, require time, resources, and support, and require highly motivated, self-confident teachers (Sander et al., 2000). Flipped classes are considered a very difficult technique for beginners and first-timers. Collins (2011) stated that those who start to apply this model encounter difficulties even after being well prepared. While teachers are enthusiastic about the transition from the traditional classroom to the flipped classroom, students are often not ready for this change. Although teachers are enthusiastic about this application, some students will react negatively and will not want to watch videos about the lesson outside of the classroom (Raths, 2014).

In addition, teachers need to design many videos so that students can learn not only in the classroom but also outside the classroom, which is a time-consuming task that requires long work and research (Bergmann & Sams, 2014). Teachers using this method spend more time for checking students. It is important that teachers prepare the most interesting materials. Enfield (2013) states that if teaching cannot be attractive, students cannot be made active in learning and financial

resources are needed for the production of materials required for flipped classrooms. Milman (2012) underlined that low quality videos cause problems in flipped learning. Milman (2012) also states that students with learning difficulties may have problems in flipped classrooms. Therefore, he argues that this approach is not suitable for special education students.

Students may develop resistance to flipped classrooms because they are expected to be more active and prepare before the lesson in flipped classrooms (Sander et al., 2000). In flipped classrooms, students are expected to be self-motivated. Students differ in their degree of motivation, and some students are not as motivated as others. This causes less motivated students to be less active. In flipped classrooms, the fact that students do activities at different times makes it difficult for teachers to follow the activity. In addition, students with poor economic conditions may have difficulty in accessing technological tools such as computers and internet required by flipped classrooms. Students who do not have a personal computer and internet access will have to access classes from public places such as libraries and internet cafes. However, these environments are crowded and may not be suitable for studying, which will cause problems. Using a computer also causes another problem. Students have to spend all their lecture and homework time in front of a computer screen. This causes the student to sit still for hours. Considering that students spend most of their time outside of the classroom in front of the screen, this is a problem (Shi-Chun et al., 2014).

In Ramírez, Hinojosa, and Rodríguez's (2014) study with STEM students, the main problems students reported regarding flipped classrooms are:

1. Technical problems: Poor internet connection that makes it difficult to watch videos, devices such as smart phones and tablets need special software to access the course content.

2. Not enough examples: In some cases, students need more than the specified number of examples to understand the subject and this is not possible if they are not prepared beforehand.

3. Lack of instant feedback: Some students stated that sometimes they could not understand the subject by just watching the video and could not get instant feedback.

4. The content is too long: Although the videos are 5-10 minutes on average, some students complained about the length of content.

Considering that the Flipped Classroom design has revolutionized teaching around the world (Strelan et al., 2020) it becomes important to examine its reflections in the studies conducted in

Turkey. The main purpose of this research is to evaluate Flipped Classroom themed master's theses and dissertations in Turkey between 2015 and 2020. Examining this method, which has not yet been used sufficiently in Turkey, will also contribute to its promotion. Considering the increased distance education opportunities, especially with the pandemic conditions, it can be argued that the use of flipped classroom applications has expanded and the need for a detailed examination of flipped classroom applications has increased.

The following research question guides this study in this context: What are the ways pursued in the Flipped Classroom themed master's theses and dissertations published in Turkey between 2015-2020 in the terms of Imprint, Method, Data collection tool and Data analysis?

Method

Research Model

Document analysis, one of the qualitative research designs, was used in this study, which aims to examine the postgraduate theses published between 2015 and 2020 on flipped classes. Document analysis includes the analysis of written materials containing information about the case or cases that are aimed to be investigated. In qualitative research, document review can be a stand-alone data collection method or it can be used in conjunction with other data collection methods (Yıldırım & Şimşek, 2016).

Data Sources

Due to the fact that the research was conducted in 2021 and in order to reveal the research trends in the studies conducted in recent years, the studies conducted between 2015 and 2020 were included in the study group. When the YÖK National Thesis Center was reviewed by the keywords "flipped classroom" and "ters yüz sınıflar (Turkish translation of Flipped Classroom), 83 theses on flipped classrooms published between 2015 and 2020 were reached. 21 of them are dissertations and 62 of them are master's theses. The demographic characteristics of the dissertation and master's theses examined in the study are presented in the tables below.

Table1.

Demographic characteristics

		f	%
Type of Thesis	Dissertation	21	25.3
	Master's	62	74.7
Publication Year	2015	6	7.4
	2016	11	13.2
	2017	11	13.2
	2018	5	6
	2019	25	30.1
	2020	25	30.1
Publication Language	Turkish	62	74.7
	English	21	25.3
Type of University	Public	75	90.3
	Foundation	8	9.7
Field	Educational Sciences	46	55.4
	Natural and App. Sciences	15	18
	Health Sciences	2	2.4
	Social Sciences	20	24.2

As seen in *Table 1*, 62 master's and 21 dissertations are included in the study. While 74.7% of the theses in the study consisted of master's theses; the rate of dissertations is 25.3%. When we examine the theses according to the year of publication, there are 6 theses from 2015, 11 from 2016 - 2017, 5 from 2018 and 25 from 2019 - 2020. To express as a percentage, the theses of 2015 have

the lowest number with a rate of 7.4%, while the theses of the years 2019 and 2020 have the highest number with a rate of 30.1%.

When the languages of the publication are examined, Turkish theses have a large share with 74.7%. While the number of theses in English is 21, the percentage value is 25.3%. Considering the theses in terms of departments, educational sciences was the department in which the most theses were conducted with 55.4% (n=46). Social sciences follow this with 24.2% (n=20). While science is in the third place with 18%, health sciences is in the last place with 2.4%.

Data Collection Tool

The theses discussed in the study were subjected to document analysis with the measurement tool developed by Demirci, Arıkan, and Onuk in 2018. This review form, which consists of ten different titles, allows the studies to be examined from 52 different perspectives, and facilitates in-depth analysis to reveal whether the studies have the basic features that should be in a scientific study. The 10 main headings that make up the Academic Publication Review Form are as follows: 1. Imprint 2. Summary 3. Introduction 4. Method 5. Data collection tool 6. Data analysis 7. Findings 8. Discussion and interpretation 9. Suggestions 10. Bibliography.

Study Group

The keywords "flipped classroom" and "flipped education" was searched in the postgraduate thesis database of the Council of Higher Education (YÖK). The contents of the theses were examined by creating a data pool from the theses found. The data set with 83 (21 dissertations, 62 master's) theses in total was created by removing the unrelated and unauthorized theses from the data pool.

Data Analysis

In the study, descriptive analysis technique was used to analyse the data, since it was aimed to examine the postgraduate theses on flipped classrooms and education in the context of various variables. According to this approach, the data obtained are summarized and interpreted according to predetermined themes. The purpose of this type of analysis is to present the findings to the reader in an organized and interpreted form. The data obtained for this purpose are first described in a systematic and clear way. These descriptions are then explained and interpreted. Cause-effect relationships are examined and some conclusions are reached (Yıldırım & Şimşek, 2016). For this

purpose, four stages were followed for the descriptive analysis: creating a framework, processing the data according to the thematic framework, defining the findings and interpreting the findings.

The theses that make up the data set were examined with the measurement tool developed by Demirci, Arıkan, and Onuk (2018). A separate form was filled for each thesis; then the data in these forms were gathered under one roof. SPSS 21.0 package program was used for the analysis of the data obtained from the research. The data in the forms filled in for each thesis were entered into the program, and a general view was presented by calculating frequency (*f*) and percentage (%) for each item (Imprint, Method, Data collection tool and Data analysis) and related sub-items in the measurement tool.

Results

Findings in Terms of the Distribution of Theses by Universities

Table 2.

Distribution by University

University	*f*	%
Gazi University	9	10.8
Atatürk University	8	10
Bahçeşehir University	6	7.2
Balıkesir University	5	6
Marmara University	4	4.8
Bülent Ecevit Üniversitesi	3	3.6
Fırat University	3	3.6
Orta Doğu Teknik University	3	3.6
Sakarya University	3	3.6
Yıldız Teknik University	3	3.6
Akdeniz University	2	2.4
Amasya University	2	2.4
Ankara University	2	2.4

Hacettepe University	2	2.4
İnönü University	2	2.4
Kastamonu University	2	2.4
Kırşehir Ahi Evran University	2	2.4
Mersin University	2	2.4
Ondokuz Mayıs University	2	2.4
Süleyman Demirel University	2	2.4
Afyon Kocatepe University	1	1.2
Ağrı İbrahim Çeçen University	1	1.2
Anadolu University	1	1.2
Aksaray University	1	1.2
Bayburt University	1	1.2
Boğaziçi University	1	1.2
Çağ University	1	1.2
Çanakkale Onsekiz Mart University	1	1.2
Dokuz Eylül University	1	1.2
Düzce University	1	1.2
Erzincan Binali Yıldırım University	1	1.2
Muğla Sıtkı Koçman University	1	1.2
Necmettin Erbakan University	1	1.2
Ufuk University	1	1.2
Uludağ University	1	1.2
Van Yüzüncü Yıl University	1	1.2

When the distribution of postgraduate theses on flipped classrooms published between 2015 and 2020 is analysed by universities, it is seen that academic studies on the subject were conducted in 36 different universities. 1 thesis on the subject was conducted in 16 of 36 universities. In terms of the number of studies, Gazi University is the university with the highest number of studies with 9

theses and 10.8%. Atatürk University follows it with 8 studies and 10%. Bahçeşehir University takes third place with 6 dissertations and a rate of 7.2%. At the same time, theses written at Bahçeşehir University have a large share of 75% among the theses written at foundation universities on the subject. While determining the method, data collection tool and data analysis findings of the theses examined, the theses were classified as dissertations and master's theses.

Findings in Terms of the Method

In this section, there are findings in terms of the analysis of the methods of the dissertations and master's theses examined.

Table 3.

Distribution by Method

		Dissertation *f*	**Master's** *f*
Sampling	Random	3	7
	Accidental	2	1
	1. Purposeful	16	46
	2. Extreme case	-	2
	3. Population	-	2
	4. Systematic	-	1
	5. Cluster	-	1
	6. Unspecified	-	2
Model	Quantitative	7	28
	Qualitative	2	7
	Mixed	12	27
Qualitative Research Design	Case	3	3
	Action	2	6
	Unspecified	-	-
Quantitative Research Design	Causal-comparative	-	4
	Quasi-experimental	8	25
	Relational	-	1
	Descriptive survey	1	2
	Meta-analysis	-	-
	Experimental	3	4
	Unspecified	-	2

Mixed Research Design	Convergent parallel	2	2
	Explanatory sequential	5	7
	Embedded	1	3
	Transformative	-	-
	Multiphase	-	-
	Triangulation	1	2
	Unspecified	3	11

Findings in Terms of the Method of Dissertations

When the findings related to the method sections of the dissertations discussed within the scope of the research are examined, it is seen that purposeful sampling is frequently used in the sample selection. In 16 of 21 dissertations purposive sampling technique is used. This is followed by random sampling.

Mixed model is used in more than half of 21 dissertations. The mixed research model is followed by the quantitative research model with 7 studies. Qualitative research method is preferred the least.

The most widely used design of the mixed research method, which is the most widely used research method, is the exploratory sequential design. While explanatory sequential design was used in 5 studies, convergent pattern was preferred in 2 studies. Embedded design and simultaneous variation design are used once. In 3 studies, it was not specified which design was used.

The most frequently used design in quantitative research methods in theses is the quasi-experimental design (f =8). Experimental design was used in 3 studies. The descriptive survey design was used only in one study.

Case study, which is one of the least used qualitative research methods among theses, was used in 3 studies. Action research was used twice.

Findings in Terms of Method of Master's Theses

When the findings related to the method sections of the master's theses are examined, it is seen that there is more diversity in the selection of the sample compared to the theses. As in the theses, the purposeful sampling technique is used in most of the master's theses (f =46). This is followed by the simple random sampling technique. Adverse event sampling was preferred in 2 studies. Again, 2 studies tried to reach the population. In two studies, the sampling technique was

not specified. When the types of research methods used in master's theses are examined, it is revealed that mostly quantitative and mixed methods are preferred. The quantitative method is used in 28 studies and the mixed method is used in 27 studies. The least used one is qualitative research method (f =7).

When the pattern distribution of the mixed method, which is the most used method in master's theses, is examined, it is seen that explanatory sequential design is used in 7 studies. This is followed by three studies and the embedded pattern. Convergent parallel pattern and simultaneous variation pattern are used twice. It is not specified which mixed research design is used in 11 of the theses. The most used quantitative research design is the quasi-experimental design (f =25). This is followed by causal (f =4) and experimental design (f =4). While the descriptive survey design is used 2 times and the relational design is used once, the pattern is not specified in the two studies. The most preferred qualitative research design in master's theses using qualitative research method is action research (f =6), followed by case study with 3 studies.

Findings in Terms of the Data Collection Tool

In this section, there are findings in terms of the analysis of the data collection tool of the dissertations and master's theses examined.

Table 4.

Distribution in Terms of Data Collection Tool

		Dissertation *f*	**Master's** *f*
Data Collection Tools	Observation	4	4
	Interview	16	33
	Tests	18	36
	Survey	4	24
	Scale	15	22
	Document	2	3
	Researcher's diary	1	1
Validity and Reliability Information	Yes	19	44
	No	2	18

Findings in Terms of Data Collection Tools of Dissertations

When the data collection tools of the dissertations included in the research are examined, it is seen that quite a variety of tools are used. The most used data collection tool in dissertations is tests (f =18). Interview is used in 16 studies and scale is used in 15 studies. While these three measurement tools are mostly used, observation and questionnaire are used in 4 studies. Document technique (f =2) and researcher's diary (f =1) are used the least.

When dissertations are examined in terms of reliability and validity, it is seen that they are included in the majority of theses. Almost all of the dissertations (f =19) included statements about reliability and validity studies. In two theses, this information is not included.

Findings in Terms of Data Collection Tools of Master's Theses

In the master's theses examined within the scope of the study, it is seen that quite a variety of data collection tools are used as in the dissertations. The most used data collection tool in master's theses is tests (f =36). Interviews follow the tests with 33 studies. The other most preferred ones are questionnaires (f =24) and scales (f =22). While these four data collection tools are used frequently, the observation is used 4 times. The researcher's diary is used in only one study.

In master's theses, the rate of information on reliability and validity is low compared to dissertations. While reliability and validity information is given in 44 theses, no information on reliability and validity is found in 18 studies, which is a substantial rate.

Findings in Terms of Data Analysis

Table 5.

Distribution in Terms of Data Analysis

		Dissertation ***f***	**Master's** ***f***
Quantitative Analysis	*t*-Test	10	36
	ANOVA	4	6
	ANCOVA	4	4
	MANOVA	5	2
	MANCOVA	1	3
	Exploratory Factor Analysis (EFA)	-	1
	Confirmatory Factor Analysis (CFA	1	-
	Mann Whitney U	5	7

	Wilcoxon	-	3
	Kruskal Wallis	2	1
	Chi-square Fit Test	1	-
	Shapiro Wilk	8	15
	Kolmogorov Simirnov	3	5
	Correlation	-	3
Qualitative Analysis	Descriptive	8	10
	Content	10	25
	Descriptive +Procedural	-	1

In this section, there are findings in terms of data analysis techniques of the dissertations and master's theses examined.

Findings in Terms of Data Analysis of Dissertations

The analysis techniques used in the dissertations, which are the subject of the research, are primarily divided into two as quantitative and qualitative analysis techniques. The most frequently used quantitative analysis technique used in dissertations is the *t*-test. The *t*-test is followed by Shapiro-Wilk with 8 times. MANOVA and Mann Whitney U test are used five times. ANOVA and ANCOVA analyses are used four times each. Kolmogorov and Smirnov analysis is preferred in 3 studies. While Kruskal Wallis analysis is used twice, MANCOVA, Confirmatory factor analysis (CFA), Chi-square fit test are other techniques used in theses.

Two analysis methods are used in dissertations using qualitative data analysis. It is seen that researchers preferred Content analysis in 10 studies and descriptive analysis in 8 studies.

Findings In Terms of Data Analysis Techniques of Master's Theses

As with dissertations, master's theses are primarily examined according to quantitative and qualitative analysis.

When the quantitative analysis methods used in master's theses are examined, it is seen that T-test is the most used analysis method as in dissertations (f =36). It is followed by the Shapiro-Wilk analysis with 15 uses. The Mann Whitney U test is used in 7 studies and ANOVA analysis is used 6 times. The other preferred analysis are Kolmogorov and Smirnov (f =5), ANCOVA (f =4). Wilcoxon T test, MANCOVA analysis and correlation are included in the studies three times. The MANOVA analysis is used twice. The least used ones are Kruskal Wallis and Exploratory factor analysis.

In the qualitative analysis methods used in master's theses, it is seen that descriptive analysis is used extensively with a number of 25. Descriptive analysis is included in ten studies. The rate of use of the Descriptive + Procedural analysis method is included in only one study. In two studies, qualitative analysis methods are not included.

Discussion and Conclusion

It is seen that a total of 83 theses, 62 of which were master's (74.7) and 21 dissertations (25.3%), written on flipped classrooms between 2015 and 2020, included in the study, include the steps to be followed in a scientific research, with few exceptions. When the reasons for the high rate of master's theses are evaluated, it can be mentioned that the number of doctoral programs is less than the number of master's programs, the duration of master's programs is shorter and simpler in content, and the conditions for admission to doctoral programs are more difficult (Gökmen et al., 2017).

Most studies on the subject were conducted in 2019 and 2020. Theses written in these two years constitute 60.2% of the total examined theses. This shows us that the concept of flipped classes has become more popular in recent years and has begun to attract the attention of researchers. Perhaps the most important reason for this situation is that the use of technology in education is gaining momentum every year. Besides, we cannot ignore the reflections of the Covid-19 pandemic, which started in 2019 and affected the whole world in 2020, on education. We can claim that distance education activities, which are applied in cases where face-to-face education cannot be done, increase awareness of technology-supported teaching activities such as flipped learning and blended learning, and this is reflected in educational research.

Most of the studies on Flipped Classrom were carried out at Gazi University. It was followed by researches conducted at Atatürk University and Bahçeşehir University. The fact that state universities are in the top two ranks is not a surprising result, primarily for economic reasons. What is interesting is that Bahçeşehir University is in the top three. Although it is a foundation university, it has hosted a significant number of studies on the subject. It hosts almost all of the theses written in foundation universities on the subject.

The fact that more than half of the theses examined within the scope of the study were made in educational sciences can be explained by the fact that flipped classrooms are a concept directly related to education. The fact that the subject has been studied in health sciences institutes reveals that flipped classrooms are a technique that can be used in many different fields. When the studies

on the subject in health sciences are examined, it is seen that it is a method used in medical doctor education, nursing education, etc.

The most preferred research method in the total of dissertations and master's theses was mixed research method. The mixed method assumes that the problems that are the subject of the research will be evaluated more soundly by using both qualitative and quantitative approaches. Since the method includes different perspectives, it provides an advantage in terms of evaluation and interpretation (Creswell, 2017). The purpose of choosing the mixed method in studies is to reveal the strengths of both qualitative and quantitative methods.

When the sampling techniques of the studies are examined, it is seen that the purposeful sampling is used in approximately 75% of all theses. Purposeful sampling is generally used to examine in detail the situations that constitute a rich source of information (Büyüköztürk et al., 2012). These researchers may have wanted to examine the subject in the context of selected cases by working on one or more special cases that meet certain criteria or have certain characteristics.

In the studies discussed, it is seen that interviews and tests are mostly used as data collection tools. The main reason for this situation is the flipped classroom technique itself. In order to reach data on the effect of flipped classes, researchers generally applied to achievement tests and interview forms. In this way, both the effect of flipped classrooms on academic achievement and the opinions of students studying in flipped classrooms about this technique were tried to be determined.

Although reliability and validity studies have been carried out in the majority of theses, the number of theses that do not include these studies is not so few as to be ignored. This situation shows that the lack of reliability and validity stated in the studies of Şimşek, Özdamar, Uysal, Kobak, Berk, Kılıçer & Çiğdem (2009) in which they examined the theses on educational technology made between 2000 and 2007 are still a common situation in their thesis studies.

As the integration of technology into education accelerates, the interest in technology-based applications such as flipped classrooms will continue to increase, which will show itself more in academic research. Also pandemic conditions have shown that distance education is an important educational instrument. The conditions have become suitable for flipped classrooms, where students learn the lesson at home, remotely, and do their lesson practices and homework at schools. Flipped classroom practices, which offer an alternative approach to the traditional classroom order, seem to continue to attract attention and be studied.

Recommendations

Only 25% of the theses examined on flipped education are at the doctoral level. More emphasis can be placed on this subject in studies at the doctoral level and specialization on the subject can be encouraged.

More than 90% of the studies were conducted at public universities. The increase in the number of studies conducted in foundation universities for the flipped education approach, where interest is increasing day by day, will be a positive development for both the literature and educational sciences in general.

It is stated in the findings that the number of qualitative studies on the subject is quite low. The number of qualitative studies can be increased in order to reveal the effects of flipped education on stakeholders and their thoughts on the subject in depth.

As it is underlined in the findings section, the number of those whose reliability and validity studies have not been carried out in the examined theses is undeniably high. This issue, which is very important in terms of being scientific in thesis studies, should be handled meticulously.

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