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Trends of Studies Conducted on the Flipped Learning: A Systematic Literature Review

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Abstract There are many tendencies in learning and teaching environments in terms of accessing new knowledge by researching and applying rather than accessing ready-made knowledge currently. Thus, many learning activities such as experiments and applications are blended with modern technological tools and added to education programmes, and the flipped learning model, whose main purpose is to provide more meaningful and richer learning by presenting the lesson with videos prepared by the teacher and spending time face to face between the teacher and the student, is a pedagogical approach centred on individual learning. Flipped learning can be adapted according to styles, conditions and methods. In this study, 49 master's and Ph.D. theses about flipped learning in the field of education between 2010 and 2023 in Türkiye were examined via the access in the National Thesis Centre Database of the Council of Higher Education. 5 sub-problem research questions were determined and analysed through descriptive content analysis by considering appropriate screening and selection criteria. As a result of the research, the findings regarding the graduate level and language, the research method and design used, the technologies used to implement the flipped learning, the sub-disciplines of the theses and the topics addressed were interpreted.

Keywords Flipped Learning, Education, Postgraduate Theses, Descriptive Analysis

1. Introduction

As a necessity for acquiring the skills of the century we live in, there has been a transition from behaviourism to constructivism in learning and teaching environments [1]. Contrary to behaviourism, in constructivism focusing on the learner, it is about accessing and producing information rather than passively obtaining information. Hence, teachers need to support students in making sense of new information with new ideas and cultural tools under necessary conditions [2]. In addition, it is rather significant for learners to acquire new skills via the use of technology in order to establish a connection between social life and classroom learning, and to be a guide for them to manage the learning process appropriate for the age [3]. Students of 21st century hold a negative attitude towards the learning environment, in which they are passive and only in the position of receiving information; however, they are advantageous in terms of accessing information and technology as they live in the technology age [4]. In this context, in order for the learner to gain 21st century skills, a learning environment should be provided, in which the learner will be active such as activities, experiments, and practices in the classroom teaching activities [5]. This may boost their learning capacity at a great rate.

The flipped learning model can be defined as a pedagogical approach focusing on individual learning rather than group learning. Flipped learning, by being presented with videos prepared by the teacher, enables the time to be spent face-to-face between the teacher and the student to create more meaningful and rich learning. In

flipped learning, teaching is individual. With these videos, it creates more meaningful and richer learning opportunities during face-to-face learning time with the teacher [6]. This learning actually provides individualized learning, and there is no single strategy being valid for each teacher and student in this learning style because it can be adapted to styles, circumstances and methods. Each teacher can also individualize flipped learning styles for their students. In-class and out-of-class activities put students at the centre and make them active [7]. In this model, student-centred learning approaches, differentiated instruction, problem-based learning, project-based learning, inquiry learning and many similar approaches can be used together [4-8].

In the realm of flipped learning, several prominent learning theories come into play. Firstly, Bloom's Taxonomy offers insights into the different stages of learning, distinguishing between information transmission and knowledge assimilation. It doesn't, however, provide specific guidance on implementation in practical education. Secondly, constructivism, as explained by Vygotsky and Piaget, emphasizes collaborative learning and active knowledge construction through experiences. Flipped learning aligns with these principles by presenting information as a tool for problem-solving before class. Lastly, Mastery Learning, popularized by Bloom, while not exclusive to flipped learning, supports it by enabling self-paced, differentiated instruction with structured objectives. Remediation is provided when students fail to master these objectives, aligning well with the autonomy and flexibility inherent in flipped learning. Additionally, reinforcement theory from behaviorism sheds light on the motivating factors in both Mastery Learning and flipped learning, explaining the transition from traditional to flipped classrooms and the role of stimuli in shaping student behavior in educational settings [10].

Flipped learning is defined by various names in the English literature. These are the concepts of *"reversed instruction", "blended learning", "inverted classroom", "flipped learning", "flipping classroom"* and "*flipped education".* Blended learning is a learning method that combines the possibilities of face-to-face education and online education and uses the advantages of both methods according to needs [9]. According to Staker and Horn [11], blended learning is divided into four parts as "*rotation", "flex", "self-blend"* and *"enhanced virtual"*, and they claim that flipped learning falls under the "rotation (flipping)" model.

In the literature, it is obvious that the concepts of *"flipped learning"* and "*flipped classroom"* are used interchangeably; in fact, these two concepts are different from each other. The Flipped Classroom is a teaching strategy focusing on the flexibility of the learning environment, where students usually learn content online by watching video lessons at home and do homework by discussing and solving questions in class with teachers and students. On the other hand, *"inverted education",* it is a pedagogical approach in which direct instruction is transformed from lecture to the whole group to an individual learning area. Applications and homework are usually done in groups in creative activities in the classroom. Students are required to be active. The teacher is responsible for providing an interactive and dynamic learning environment and guiding students. Therefore, flipped learning is a broader concept which includes the flipped classroom concept [12].

According to FLN [12], there are four basic building blocks of the flipped learning approach. The first pillar of flipped learning is about flexible learning environments. Flipped classrooms should be suitable for the use of a variety of learning techniques. Educators must be able to physically rearrange their learning spaces to study the course or unit, which can often include group work, independent study, research, performance and assessment. The second pillar of the model is about the new generation learning culture as flipped learning requires a change in learning culture. In the traditional teacher-centred model, the teacher is the main source of information which is regarded as the only content expert who provides information to students, usually through direct narration [13]. In flipped learning, there is a conscious shift from a teacher-centred classroom to a student-centred approach where classroom time is geared towards exploring topics in greater depth and creating richer learning opportunities. Students move to the centre of learning as they actively participate in knowledge construction through opportunities to assess their learning and participate in lessons. The third pillar of the model concerns the choice of content and materials. Flipped learning requires deliberate and conscious content selection. Educators should determine in advance which content and materials they will use for direct instruction and which content students will work on in classroom practice. They should also make a comprehensive evaluation of these contents after the implementations and make arrangements where necessary. The last pillar of the model is related to the professionalism of the trainers. Skilled, professional educators are indispensable in flipped learning. Educators have very important tasks such as determining when and how to transform direct instruction from a whole class to individual learning space, maximising teacher-student and student-student interactions during classroom practices, observing continuously during the lesson, giving feedback to students and evaluating their work. Therefore, educators should be reflective, collaborate with other colleagues, accept constructive criticism and have classroom management skills [6-12].

Many studies have been conducted on flipped learning in the world and in Türkiye. In recent years, the increase in educational technologies and the integration of technology into education has led to an increase in applications related to the flipped learning model [14-15-16-17-18]. The flipped learning has also been reported to reduce learners' anxiety levels [19], encourage collaborative learning [20],

contribute to active learning [21-22-23], increase the retention of learning [5], reinforce learning with practice activities [24], and develop problem solving and questioning skills [25]. In addition, various literature reviews [26-27] and meta-analysis studies [28-29-30] were conducted to provide researchers with a perspective on this issue.

On the other hand, there are a limited number of researches that can reveal the studies conducted in this field and describe what the general trend is [3,31,32]. Among these, Aydin and Demirer's [31] study analysed articles and theses conducted between 2011 and 2015, while Yıldız, Sarsar and Çobanoğlu's [3] study analysed 40 studies conducted between 2011 and 2016. However, considering the importance of the different effects of national approaches in the teaching process, there is no research that reveals the tendency towards the relevant model on a national scale and in the context of theses that contain detailed information and long-term research. Based on this need, in this study, 49 theses published between 2010 and 2023 were analysed. Thus, it will be possible to make an up-to-date evaluation of the studies on flipped learning, especially in higher education institutions, to determine the trends on the subject and to see the dimensions that have not been studied.

In the current study, it is aimed to indicate the results obtained by analysing the theses on flipped learning from various perspectives. In regard with the aim of the study, thesis studies on flipped learning were analysed under various categories. It is thought that the data obtained are important in terms of revealing the tendency towards flipped learning and the outcomes about flipped classroom. In line with the aim of the study, answers to the following problems were sought:

1. How is the distribution of the examined theses according to the types of graduate programmes and the language used?
2. What are the research methods used in the analysed theses?
3. What are the technologies used to implement flipped learning in the analysed theses?
4. In which sub-disciplines were the analysed theses conducted?
5. What are the topics covered in the analysed theses?

2. Materials and Methods

In this study, 49 theses on flipped learning, which were obtained through a systematic literature review in line with the determined criteria, were analysed, and document analysis was conducted to explain the data obtained and to reach the necessary relationships. Document analysis is a qualitative research method used to analyse the content of written documents meticulously and systematically [33]. Document analysis also requires analysing and interpreting the data in order to make sense, to create an understanding of the relevant subject, and to develop empirical knowledge [34].

2.1. Data Collection

In this study, 49 theses on flipped learning in Türkiye were analysed. The theses included in the study were determined by examining the database of the Council of Higher Education (YÖK) Presidency Thesis Centre (www.tez.yok.gov.tr). These studies consist of master's and doctoral theses in the field of education between 2010 and 2023, which are available in the National Thesis Centre Database of the Council of Higher Education. After a detailed review of the related literature and examination of the usage patterns, the key concepts were determined as "flipped classroom, flipped learning and flipped instruction". A total of 159 theses were found; 84 theses with the key concept "flipped classroom", 46 theses with "flipped learning", and 29 theses with "flipped education".

All studies that could not be identified through keywords and all theses that could not be accessed through open access were excluded from the research. These theses were scanned again by typing "education and training" in the subject area and 14 theses outside this subject area were eliminated. The target study group of the 145 theses obtained was examined and only theses conducted in higher education institutions were selected. Among the theses analysed, 49 studies were found to be implemented in higher education institutions and only these theses were included in this study. The data related to these theses obtained as a result of the final screening were recorded in the SPSS programme. For the analysis of the theses, a total of 8 variables were determined: year of publication, type of postgraduate programme, publication language, educational sub-discipline, method used, design used, technologies used and related subject areas.

2.2. Data Analysis

List A total of 49 theses, which were accessed as a result of the literature review and found appropriate to be included in the research, were analysed through descriptive content analysis by taking into account the screening and selection criteria determined in accordance with the aim of finding answers to the research problems. Descriptive content analysis method means in-depth examination and organisation of qualitative and quantitative studies conducted independently of each other in a particular subject or field. Thus, general trends in that subject or field are determined. The results obtained in this method are expected to guide future studies planned for the targeted topics [35]. In this context, the year each thesis was written, the level of postgraduate education, the research method, the design used, the technologies used to implement flipped classroom teaching, the sub-discipline in which it was carried out and the topics covered were examined in detail. Frequency (f) and percentage (%) values for the results are

presented in tables.

3. Findings

The findings for each sub-problem determined in line with the aim of this study are presented under the relevant sub-heading in this section. In this context, the findings obtained for each sub-problem and the comments related to these findings are presented.

3.1. Findings for the First Sub-Problem

The findings related to the type of graduate programme of the thesis studies on flipped learning in Türkiye and languages that are used in these studies are given in Table 1 below.

Table 1. Distribution of Theses on Flipped Learning According to Graduate Programme Type and Language Used

Graduate Program	**f**	**%**
Master's	36	73.46
Ph.D.	13	26.54
Total	49	100
Language	**f**	**%**
Turkish	31	63.26
English	18	36.74
Total	49	100

The results in Table 1 highlight that 73.46% (f=36) of the theses applied in higher education institutions are master's theses and 26.54% (f=13) are doctoral theses. In addition, 63.26 % of these theses are written in Turkish (f=31) and 36.74 % are written in English (f=18).

3.2. Findings for the Second Sub-Problem

The findings regarding the research methods used in the thesis studies on flipped learning in Türkiye are presented in Table 2.

As seen in Table 2, mixed research method (48.97%) was mostly preferred in the studies based on flipped learning. This is followed by quantitative (34.69%) and qualitative (16.32%) research methods respectively. While the most preferred qualitative research design was case study (f=4), the most preferred quantitative research design was experimental studies (f=10) and the most preferred mixed research design was sequential explanatory design (f=12).

3.3. Findings for the Third Sub-Problem

The technologies used to implement the flipped learning model in the theses analysed were grouped under the themes of the content creation and content delivery. Frequency values related to these technologies are presented in Table 3.

Table 2. Distribution of Theses on Flipped Learning According to the Method and Design Used

Method	**Design**	**f**	**%**
Qualitative	Case Study	4	16.32
	Action Research	3	
	Phenomenology	1	
	Total	8	
Quantitative	Experimental	10	34.69
	Scanning Pattern	7	
	Total	17	
Mixed	Sequential Explanatory	12	48.97
	Embedded	6	
	Converging Parallel	2	
	Simultaneous Transformational	1	
	Simultaneous Parallel	1	
	Nested	1	
	Intervention	1	
	Total	24	

Table 3. Technologies Used in Theses Related to Flipped Learning

Theme	**Technology Used**	**f**	**%**
Content Creation	Camtasia Studio	7	14.28
	Powerpoint	10	20.40
	Kahoot	15	30.61
	Edpuzzle	6	12.24
	iMovie	5	10.20
	EverCam	4	8.16
	Captivate Educreations	2	4.08
	Total	49	100,0
Content Delivery	Moodle	10	20.40
	Youtube	9	18.36
	LMS	12	24.48
	Facebook	3	6.12
	Edmodo	6	12.24
	Blackboard	3	6.12
	Blog	2	4.08
	DropBox	1	2.04
	Google Docs	3	6.12
	Total	49	100,0

As indicated in Table 3, Kahoot application (f=15, 30.61%) is most frequently used to create content in studies based on flipped learning. This is followed by Powerpoint (f=10, 20.40%) and Camtasia Studio (f=7, 14.28%) applications respectively. In order to deliver the created content, learning management systems (f=12, 24.48%), Moodle (f=10, 20.40%), Youtube (f=9, 18.36%) and Edmodo (f=6, 12.24%) were most frequently used.

3.4. Findings for the Forth Sub-Problem

The findings obtained as a result of the analyses conducted to determine in which sub-disciplines the thesis studies on flipped learning in Türkiye were written are presented in Table 4.

Table 4. Sub-disciplines in which theses on flipped learning were written

Educational Sub-Disciplines	f	%
Education Programmes and Instruction	16	32.65
English Language Education	12	24.48
Computer and Instructional Technologies	7	14.28
Education Technology	4	8.16
Mathematics and Science Education	3	6.12
Education Management and Supervision	2	4.08
Social Studies Education	2	4.08
Classroom Education	1	2.04
Turkish Education	1	2.04
Chemistry Education	1	2.04
Total	49	100,0

As indicated in Table 4, most of the theses on flipped learning in Türkiye (f=16, 32.65%) were conducted in the field of Education Programmes and Instruction. This is followed by English Language Education (f=12, 24.48%), Computer and Instructional Technologies (f=7, 14.28%) and Educational Technology (f=4, 8.16%) programmes. It is understood that the number of theses in Classroom, Turkish and Chemistry Education programmes (f=1, 2.04%) is quite low.

3.5. Findings for the Fifth Sub-Problem

While analysing the topics and variables addressed in the theses on flipped learning in Türkiye, it was found that some studies were studied on more than one variable. The findings regarding these data are given in Table 5.

As shown in Table 5, the most studied variable in the theses is academic success (f=15, 21.73%). This is followed by student participation (f=12, 17.39%) and student opinions (f=11, 15.94%). Motivation (f=9, 13.04%) and self-efficacy perception (f=8, 16.32%) are also among the preferred variables.

Table 5. Topics Covered in Theses Based on Flipped Learning

Variables	f	%
Academic Success	15	21.73
Student Participation	12	17.39
Student Opinions	11	15.94
Motivation	9	13.04
Self-efficacy Perception	8	16.32
Attitude	6	10.14
Student Satisfaction	4	5.79
Writing Skills	2	2.89
Problem Solving Skills	2	2.89
Total	69	100,0

4. Conclusions and Discussion

The findings detailed in the queried reports bring forth several noteworthy aspects of theses based on Flipped Learning executed in Türkiye. The review suggests that a substantial majority (73.46%) of theses on Flipped Learning were created at the master's level, with Turkish being the primary language. In Turkey's academic scene, it's quite customary for scholarly works at the master's level to use the native language due to the broader reach and comprehension within the community. This dominance of the Turkish language also aligns with the findings of Aydın and Demirer [31], where they identified that Turkish is the most used language in academic articles on flipped classrooms in Turkey universities. This emphasis on the master's level could be attributed to the practical nature of Flipped Learning, which is often implemented in classroom settings.

Most theses preferred mixed-methods, followed by quantitative and qualitative methods. The mixed-methods approach allows for a more comprehensive investigation, linking the strengths of both qualitative and quantitative data for more compelling evidence (Creswell, 2009). It's observed from Karaca's [36] research that mixed methods are mostly employed in flipped classroom research to get a more detailed perspective. This preference for mixed methods underscores the multidimensional nature of Flipped Learning and the need to capture both quantitative outcomes and qualitative insights.

Kahoot application, Powerpoint, and Camtasia Studio are commonly engaged technologies for content creation, while Learning Management Systems (LMS), Moodle, Youtube, and Edmodo dominate in content delivery. As noted in Bishop and Verleger's [37] study, these platforms and applications adequately support the flipped learning approach by providing diverse, flexible, and student-centered teaching tools to implement and enhance flipped classroom strategies. The technological choices in these theses emphasize the importance of digital tools in facilitating the Flipped Learning model.

Most studies were conducted in the field of Education Programmes and Instruction, followed by English Language Education, showing the adoption and interest for the Flipped Learning model in these domains. This concentration in subject areas necessitating practice-based activities corroborates with the findings of Sams and Bergmann [38] that emphasize how flipped learning promotes active student participation, catering well to disciplines like these that require engaging learning experiences. This trend highlights the potential for Flipped Learning to enhance practical learning in these domains.

Academic success, student participation, student opinions, motivation, and self-efficacy perception were commonly addressed in these theses, reflecting Flipped Learning's learner-centered characteristic. These topics signify a vast interest in understanding learning dynamics and outcomes associated with Flipped Learning, aligning with research by Strayer [20] that individuates how the flipped classroom impacts variables like student satisfaction, self-efficacy, and peer interaction. The consistent focus on these variables suggests the pedagogical relevance of Flipped Learning in addressing key aspects of student learning and development.

In summary, the exhaustive analysis conducted of theses pertaining to Flipped Learning in Türkiye brings to light the trends and patterns emerging in higher education. While Flipped Learning saw an extensive use in a variety of disciplines, further research could explore its application in more diverse subjects and evaluate its long-term impact on students' growth and skills development.

Evidently, the flipped learning model is an emerging trend in Turkish higher education based on the analyzed theses. As supported by Yildiz, Sarsar, and Çobanoğlu [3], the mixed-methods approach was the most embraced, suggesting researchers valued an integrated approach in understanding the multiple facets of flipped learning. This is identifiable as a recent global research trend, reflected in studies such as those by Creswell [39] and Johnson, Onwuegbuzie, and Turner [40].

Outgrown technological use in the 21st century has influenced the advancement in teaching methodologies acknowledged in the theses. The abundant use of Kahoot, PowerPoint, LMS such as Moodle, and YouTube aligns well with flipped learning's reliance on technology for content delivery, augmenting a student's control over the learning process. This is consistent with studies such as Zainuddin and Halili [8] and Hung [41], accentuating digital platforms' feasibility in advancing self-directed learning.

Education Programs and Instruction, English Language Education, and Computer and Instructional Technologies are identified as prevailing disciplines integrating flipped learning. The focus in these disciplines might be attributed to the interactive and practical nature of their subject matter that correlates well with flipped learning. Various studies, like Roehl, Reddy, and Shannon [4], also advocate the affinity of active-learning disciplines towards flipped learning. However, a focus expansion across other disciplinary areas could enhance the use and understanding of flipped learning.

Key areas examined in the theses, including academic success, student participation, motivation, and self-efficacy, align to tenets of flipped learning. Extensive research inputs on these areas, like those by Abeysekera and Dawson [42] and Betihavas, Bridgman, Kornhaber, and Cross [43], emphasize the model's efficacy in improving academic performance and self-regulation, critical components of 21st-century learning skills.

In essence, an evaluation of these theses offers a panoramic view of the current state, opportunities, and potential dimensions of growth for flipped learning in Turkish higher education. While the trend and efficacy of flipped learning are apparent, more diverse and deeper exploration can further illuminate the impact and benefits of this model across different areas of learning.

The paradigm shifts from behaviorism to constructivism in current learning and teaching methodologies demands a more active role from students, with a focus on creating and accessing information rather than passively receiving it [1]. As a response to this demand, the Flipped Learning model was developed incorporating various key theories such as Bloom's Taxonomy, constructivism, and Mastery Learning [4-10]. Flipped Learning aims to prioritize individualized learning, fostering engagement, autonomy, and meaningful interaction, aligning well with the proactive skills required in the 21st century [6-7].

The review of the 49 theses reveals that Flipped Learning is widely adopted in Turkish higher education. Most of the theses are master's theses, with Turkish as the dominant language of instruction. Flipped Learning appears within various academic disciplines with a concentration in Education Programmes and Instruction, and English Language Education. The prevailing research methodologies applied in these theses are mixed methods (48.97%), followed by quantitative (34.69%) and qualitative (16.32%) (Table 2). While these observations give an overall view of the trends, a closer look at the specific elements of Flipped Learning unveils additional details.

Technologies play a pivotal role in the successful implementation of Flipped Learning. The examined theses highlight the usage of various content creation applications, with a strong preference for Kahoot, Powerpoint, and Camtasia Studio (Table 3). Delivery of the created content is majorly facilitated through Learning Management Systems (LMS), Moodle, Youtube, and Edmodo. These technologies uphold the flexible and decentralized nature of Flipped Learning, enabling it to fulfill its pedagogical objectives effectively.

The examination of the content of these theses reveals common themes centered around variables like academic success, student participation, and student opinions. Qualities like motivation, self-efficacy perception, and satisfaction are commonly addressed, reflecting the

learner-centered dimension of Flipped Learning (Table 5). These topics suggest that a significant majority of research on Flipped Learning is concerned with its impact on learners' development, with a particular focus on active engagement, autonomy, and academic success.

In conclusion, the examined theses signify a growing interest in Flipped Learning in higher education in Türkiye. The increased incorporation of technological tools, along with the focus on active engagement and individualized learning stands as invaluable elements of this model. Future studies could explore more diverse applications of Flipped Learning across different disciplinary areas, setting a broader context for its implementation. Furthermore, research examining the long-term effects of Flipped Learning on students' intellectual growth and skill acquisition would add considerable value to the existing body of knowledge.

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