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A systematic review of flipped classroom studies in Turkish education

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Abstract

The purpose of this systematic review is to investigate the flipped classroom (FC) studies conducted in Turkey. The review reported on 38 studies- 27 research articles, 9 master's theses and 2 PhD dissertations- published from 2014 till 2017 in ERIC, Science Direct, Web of Science, ULAKBIM, EBSCOhost, JSTOR, CoHE, and DOAJ. The results showed FC related studies conducted in Turkey have four major focuses: achievement, attitudes, motivation and perspectives of the students in FC and traditional classrooms. As a results, the majority of the studies concluded that students taught in FC increased their achievement, are reported to be more motivated, and developed positive attitudes.

Keywords: *Flipped classroom, Systematic review, Turkish education*

1. Introduction

In order to keep up with the technology, educational strategies and methods also need to be revised and updated. There have been important changes in education system up to know such as use of different methods or change in the roles of teachers and students (Yıldırım & Kıray, 2016). According to Bishop and Verleger (2013), a model enabling students to reach the contents individually, to have active roles and to follow the content in accordance with their individual interest areas is initially preferred with the contribution of rapid changes in technology today since the generation, today, called as millennial generation (Wilson &Gerber, 2008) or digital natives (Prensky, 2001) has more access to technology and information easily, which makes the traditional teaching models insufficient to meet students' expectations (Yıldırım & Kıray, 2016). In this sense, instead of traditional teaching methods, it is suggested to create learning environments including active learning strategies for problem solving (Barak, Harward, Kocur & Lerman, 2007; Marbach-Ad & Sokolove, 2002). Therefore, it became a necessity to create learning environments for individuals to make them question, use technology effectively and develop higher-order thinking skills (Azemi, 2013; Bishop &Verleger, 2013; Tezci & Perkmen, 2013). In recent years, the learning concept expressed in various ways such as "Flipped Classroom" and "Inverted Classroom" in international studies and "Ters-Yüz Sınıf Modeli" "Çevrilmiş Öğrenme Modeli" or "Evde Ders Okulda Ödev" (in Turkish, partly surpass the borders built by learning environments (as cited in Yıldırım & Kıray, 2016). Although the idea of flipped classroom is not new (Davies, Dean and Ball, 2013) and it has been in existence within the broader educational sphere for a number of years (Tan, Yue & Fu, 2017); the modern flipped classroom began in 2007 in a high school chemistry course in Colorado (as cited in Tan et al., 2017). Jonathon Bergmann and Sams (2012) recorded videos and screen casting in order to compensate for the lessons their students

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missed because of competitions and other events, and the instructors required the students to take notes on the videos and come to class with one thoughtful question to ask and share. The results showed that students began interacting more in the class and time could be used more efficiently and flexibly, and flipped classroom allowed them to spend much more time with students and to provide them with immediate feedback when needed (Ekmekçi, 2017) According to Tan et al. (2017), compared to traditional lecture-based classrooms; flipped classroom transforms learning from passive to an active process, facilitates learning by technology, allows more individualized guidance and practice and more in-class time to apply theoretical concepts in addition to the relation of learning content to the real-world scenarios, helps students to improve self-efficacy through self-studying, and lastly focuses on more challenging concepts and fosters critical thinking and problems-solving skills.

Flipped classroom is an instructional strategy that provides a new methodology and modality for teaching and learning by minimizing direct instruction in teaching and maximizing one-to-one interaction and cooperative learning to encourage social interaction, teamwork and cultural diversity (Tan et al., 2017). Besides, problem solving, collaborative group works, self-evaluation, peer tutoring as the active learning strategies become more preferable for making students active in the environment (Kim, Kim, Khera &Getman, 2014; McLaughlin & Rhoney, 2015). Many studies have already reported that the flipped classroom had a positive effect on education outcomes, such as accelerating self-learning, improving academic performance or exploring students' perceptions and attitudes towards it (Başal, 2015; Bauer-Ramazani, Graney, Marshall & Sabieh, 2016; Davies et al., 2013; Deslauriers, Schelew & Wieman, 2011; Gençer, 2015; Huang& Hong, 2015; Hung, 2015; Love, Hodge, Grandgenett & Swift, 2014; Marcey& Brint, 2011; McLaughlin, Roth, Glatt, Gharkholonarehe, Davidson, Griffin, Esserman & Mumper, 2014; Nichols, 2012; Perez & Riveros, 2014; Stone, 2012; Temizyürek& Ünlü, 2015).

The purpose of this study to analyze the studies conducted in Turkey with a focus on comparison of the flipped classrooms with traditional lecture-based classrooms to see: i: to what extent flipped classrooms affect students' achievement, ii: how motivated students are in the flipped classrooms and what their attitudes are towards the use of flipped learning, and iii: what students' opinions are about the use of flipped classrooms.

2. Literature

The flipped classroom is an emerging pedagogical model in which traditional lecture is moved outside the classroom via technology and assigned as homework while in-class time is spent on collaborative inquiry-based learning (Bergman & Sams, 2012; Johnson, Becker, Estrada& Freeman, 2014; Lage, Platt, & Treglia, 2000; Stone, 2012; Tucker, 2012). Besides, it is also a model which contributes to make learners take their own learning responsibilities (Fulton, 2012). The main goal is to provide learners a more authentic learning (Johnson et al., 2014). Moreover, flipped classroom results in greater teacher-student rapport and increased student-student interaction and more in-class time was allocated to conducting engaging activities (as cited in Kurt, 2017). The flipped classroom is defined by Bishop and Verleger (2013) as follows:

> The flipped classroom is a new pedagogical method, which employs asynchronous video lectures and practice problems as homework, and active, group-based problem solving activities in the classroom. It represents a unique combination of learning theories once

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> thought to be incompatible- active, problem-based learning activities founded upon a constructivist ideology and instructional lectures derived from direct instruction methods founded upon behaviorist principles. (p. 1)

According to Yıldırım and Kıray (2016), flipped classroom model provides an environment which include Project based or real world practices for learners in order to learn the subject better at class time. Moreover, the learners watch course videos, listen to podcasts, reach e-books and meet peers online instead of getting information from teacher only at class time as they can reach sources whenever they need.

Individualized and differentiated learning is enabled by integrating direct instruction and constructivist learning pedagogies. Learning is not limited within the classroom; students develop with an appropriate pace and direct their efforts to the points that they personally need. Students are expected to take the responsibility of their own learning. The teacher's role changes from the authority who organizes class time to a guide who provides asynchronous learning resources in case of need and effective FC classrooms share some common points: (1) students turn into active learners rather than passive listeners, (2) generally, technology enables putting less effort, (3) in-class time and traditional homework time change place and in-class time becomes more flexible in order to provide individualized learning, (4) the content includes real life scenarios and (5) in-class time is used either for enabling students to understand difficult concepts or making them participate in high-level critical thinking and problem solving activities (as cited in Boyraz & Ocak, 2017). Educause (2012) described flipped learning as:

> '….. a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions. The video lecture is often seen as the key ingredient in the flipped approach, such lectures being either created by the instructor and posted online or selected from an online repository' (p. 1).

Although flipped learning is generally identified as including video lectures; pre-recorded lecture can be also in the forms of podcast or other audio format (Ekmekçi, 2017). Similarly, Bergman and Sams (2012) state that teacher-created videos that students watch are not the crucial point in flipped classrooms; yet how the best use of videos in-class-time with students is important (as cited in Ekmekçi, 2017) since active learning and participation, student involvement, blended course design, interaction of students with each other are emphasized (Educause, 2012). According to Yılmaz and Baydaş (2017), with the flipped classroom method, students read and view video lectures on an online platform at home before attending in-class sessions where they participate in more interactive and higher-order activities. The activities may be in the form of pre-class asynchronous such as captured videos, interactive videos, online videos, podcasts, presentations, screencasts and notes or outside or in-class synchronous such as students' participation in problem-solving activities, presentations, discussions, debates or role-plays (as cited in Yılmaz & Baydaş, 2017).

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A comparison of traditional and flipped classrooms in terms of activities is presented in Figure 1 below:

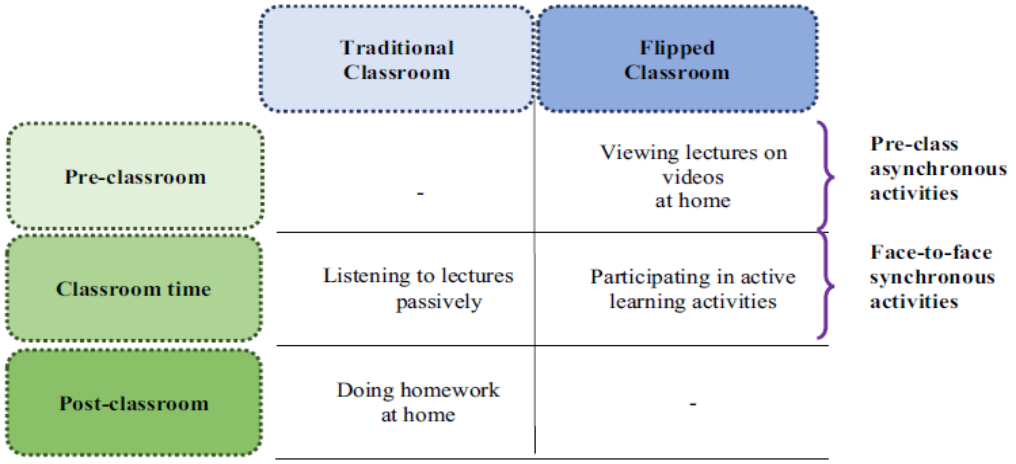

Figure 1. Summary of the Flipped Classroom Approach (Mok, 2014)

There are different flipped learning models with diverse focuses. While traditional "Flipped" Learning model by Khan Academy and "Flipped Mastery Model" by Bergmann and Sams (2012) focus on transferring content to students, Gerstein (2011) work on learning cycle of "Flipped Classroom Model", Staker and Horn (2012) concentrate on physical and virtual dimensions (as cited in Yıldırım & Kıray, 2016). Chen, Wang, Kinshuk & Chen (2014) proposed a more comprehensive model for higher education where each letter symbolizes subscales:

F- Flexible Environments
L- Learner-Centered Approach
I- Intentional Content
P- Professional Educators
P-Progressive Networking Learning Activities
E- Engaging and Effective Learning Experiences
D- Diversified and Seamless Learning Platforms

Lastly, there are lots of websites and application that can be used in flipped classrooms. Some of these applications and websites are Reef Polling, Kahoot, Moodle Mobile, Voscreen, Storylines, Teacherkit, Classroom, AudioLibrary, Zaption, Vivavideo, 30 Handstarter, Googledrive, SoundCloud, Keynote, Everynote Peek, Ibooks, Dropbox, Pages, Skitch, Penultimate, ShowMe, Notability, Screenchomp, Socrative Teacher Clicker, Educreation Whiteboard, Voice Thread, Edmodo, Phonics Genuis, Classdojo, Wordsalad, Kidblog, BrainPOP, Teachsmith Relay, Adobe Presenter 10, Microsoft Office Mix, Swivl, Voxer, Ourboox (Ceylaner, 2016).

2.1. Framework of the flipped classroom

Constructivism asserts that knowledge resides in individuals; that knowledge cannot be transferred intact from the head of a teacher to the heads of students. The student tries to make sense of what is taught by trying to fit it with his/her experience (Lorsbach & Tobin, 1992). Moreover, the theory also implies that the learners or the individuals are constructors of their own knowledge which is generated by interacting with their socio-cultural environment (Vygotsky, 1978). In this sense, the roles or teachers and learners differentiate from traditional classrooms as teachers'

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function is to arrange the conditions of learning (Gagne, 1985). Accordingly, it can be stated that flipped classroom model is based on constructivism in that students are given a chance to construct their own knowledge via elaborating on the topics before, during, and after class by themselves, as active learners, with the guidance of teachers in the learning process. Moreover, through interaction with their peers, they also construct knowledge through meaningful interactions in a social context. In other words, collaboration, interaction and engagement of learners in the flipped classroom, students "work through problems, advance concepts, and engage in collaborative activities which are effective in supporting their higher level of understanding (as cited in Kurt, 2017). Furthermore, emphasis on interaction among peers in classroom is basis for social constructivism which is supported in flipped classrooms via allocation of the class time activities to collaborative tasks rather than lecturing.

On the other hand, learners' readiness, autonomous learning, assimilation and accommodation of the information, discovery learning, development of problem solving skills from simple to complex ones and most importantly construction of their own knowledge through meaningful activities are supported in through the implementation of flipped learning. Hence, it can be stated that cognitive learning theory is also basis of flipped classrooms in terms of its interest in the mental side of learning. Since students can control their own learning as active learners in charge of their own learning process rather than memorization of the knowledge, they construct their own knowledge.

Moreover, Mastery Learning can be also seen in the design of flipped classrooms in that students are allowed to move at their own pace and can receive immediate feedback on their current level of mastery through the establishment of individualized learning opportunities. Like in mastery learning, instructors or teachers organize the concepts and skills they want to teach in the following class hour or week via videos and providing immediate feedback through the preparation of quizzes at the end of the flipped material, it helps students identify what they have learned well to that point and what they need to learn better (as cited in Guskey, 2005). Hence, the teachers can follow students' improvement, and suggest them extra materials in the class activities.

Furthermore, differentiated instruction is also evident in the flipped classroom (Kurt, 2017). Differentiating, or personalizing, instruction involves the identification of the needs and preferences of learners and the organization of instruction that is meaningful and relevant to their learning (Algozzine & Anderson, 2007; Keefe, 2007). Similarly, students can watch the videos or complete the activities according to their own needs and preferences in accordance with their own pacing. Also, teachers, as facilitators or guides, can give immediate feedback to the students on their learning process, and differentiate their instruction and materials in the line with students' needs and pacing.

Lastly, flipped classroom's design is appropriate for the Bloom's taxonomy since students complete the lower forms of cognitive thinking (gaining knowledge and comprehension) outside the class while higher forms of cognitive thinking (application, analysis, evaluation ad creation) in class with the support of their peers and instructors (Brame, 2013). Unlike traditional classrooms, flipped classrooms encourages the development of higher thinking skills that students need to acquire the knowledge. While lecturing which includes lower level cognitive skills in Bloom's Taxonomy like remembering and understanding is the main activity in the classroom in TE, this situation is "flipped" and problem solving, experiments and doing exercises that require higher level cognitive skills in Bloom's Taxonomy like analyzing and creating replace lecturing

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(Boyraz & Ocak, 2017). The figure 2 below shows the difference between traditional classrooms and flipped classrooms in terms of the representation of the activities:

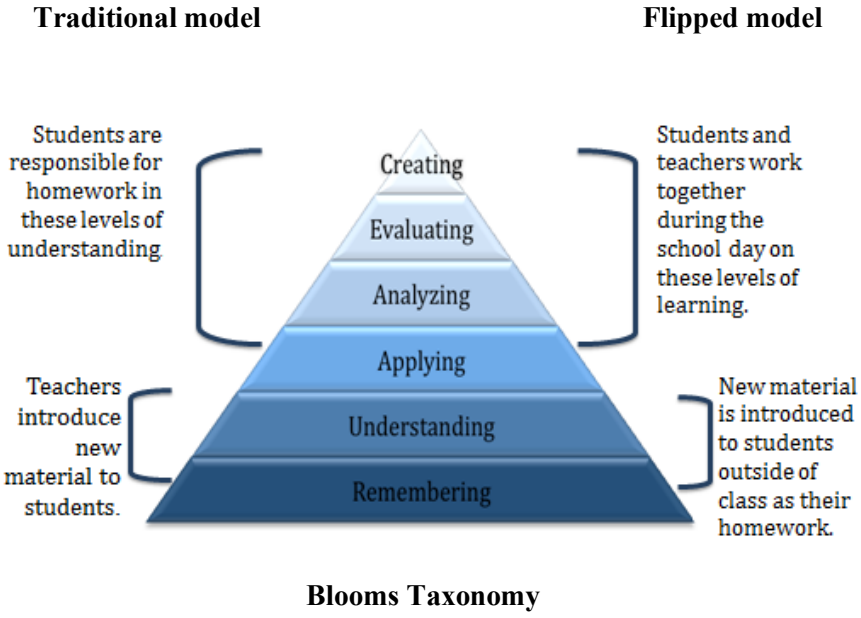

Figure 2. Ways that Bloom's Taxonomy is applied to traditional vs. flipped classroom activities (Williams, 2013)

2.2. The Advantages of flipped classroom

The Flipped Classrooms which are called radical changes by Bergmann and Sams have many advantages for both teachers and students (as cited in Yıldırım & Kıray, 2016). They also added that this is a good motivator for most of the students (Bergmann & Sams, 2012) since the technological tools such as smartphones and tablet computers that are widely used by students in daily life are a widely used part of this method that increases students' motivation (Boyraz & Ocak, 2017). The advantages can be ordered as in the following (Fulton, 2012; as cited in Yıldırım & Kıray, 2016):

- Each student can follow their courses according to their own understanding speed, there is opportunity to watch again and again if necessary.
- Homework is done in class; students can ask questions about the subjects they did not understand comfortably, educators may also provide suitable solutions according to the talent of the students.
- Students have a chance access course 7/24.
- Time spent in classroom is used more effectively in terms of both students and educators.
- Educators who have taught using this method indicated that they got higher results from the tests when compared to traditional method results.
- More time can be spent with students about the original research and students are able to spend more time with scientific equipment that can only be used in the classroom
- Students' being able to easily follow the classes which they couldn't because of sport, conference activities.
- Method pushes up student to think and study inside and outside the classroom • Students' being more active in the learning process.

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- Students will participate to the learning environment more actively, and this will cause students to love the work they do.

Similarly, Bergmann, Overmeyer and Willie (2011) listed the advantages of flipped classrooms over traditional classrooms with three points: FC encourages life-long learning in that students have a chance to improve their knowledge to reach information through technology FC enables students to analyze the quality of materials by themselves via concentrating on its strengths and weaknesses, which helps them learn the subject better. FC increases the interaction between students and the school as a whole by means of increasing peer interaction and student-teacher interaction since students have to cooperate with each other to complete the tasks in the classrooms.

2.3. The limitations and disadvantages of flipped classroom

The disadvantages of flipped classrooms may be caused by materials, teachers, and students. In terms of the materials, the need for computers and internet connection (Duerden, 2013; Jenkins, 2012; Miller, 2012; Yıldırım & Kıray, 2016) and the need to find quality videos or sources (Talbert& Valley, 2012). On the other hand, giving responsibility of both preparation and following students' online activities to the teachers can be difficult for them due to time allocation and their adaptation problems (as cited in Yıldırım& Kıray, 2016). Lastly, students may have difficulty in adaptation to the new methods and may have difficulty in understanding the subject on their own in the beginning (as cited in Yıldırım& Kıray, 2016).

3. Methodology

A systematic review was carried out in 8 databases: EBSCOhost, ERIC, Web of Science, Science Direct, Ulakbim, CoHE, DOAJ and JSTOR. The following search terms included: flipped, flipped learning, flipped classroom, ters yüz öğrenme and each word/ word group searched in combination with Turkey and Turkish education. Besides, reference lists of relevant identified articles were hand searched on Google scholar. The search was completed on January 10, 2018. Refereed journal publications from 2014 to 2017 inclusive were identified. A total of 1003 records were searched in the beginning, and the search strategy focused on the title, keywords and abstract of each record. 338 articles retrieved after the removal of duplicates.

The inclusion criteria as displayed in the PRISMA diagram below are: a) contemporary research articles dating from 2014 to 2017, b) context: studies conducted in Turkey, sampling Turkish population, c) language: studies published in English and Turkish, d) source: peer-reviewed articles, theses and dissertations open to access, e) type: research articles and exclusion of review articles, conference proceedings or book chapters, and f) interest: implementation of flipped learning in comparison to traditional lecture-based classrooms. After the implementation of the inclusion and exclusion criteria, 38 studies were found eligible for the review. Accordingly, 27 research articles, 9 master's theses and 2 PhD dissertation were found suitable for the review. Among the studies, 7 of them are qualitative, 11 of them are quantitative and lastly 20 of the

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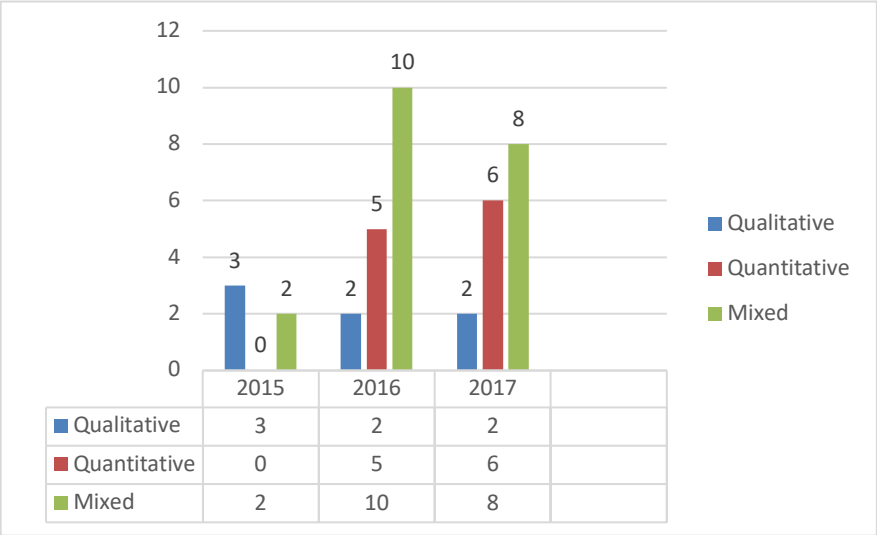
studies are mixed-method design. Graphic 1 shows the distribution of studies in terms of the years studies conducted and research design below:



Graphic 1. The distribution of the flipped classroom studies in education in Turkey with respect to year

Following the analysis of the articles, major themes that the studies analyzed in comparison with traditional lecture-based teaching were found out. Appendix 1 presents a detailed information about the studies included in the review with their author/s, publication year, purpose, study design, sample (population and number of the participants) and lastly the major themes found in the study.

4. Results and Conclusion

The four themes identified from the review of Table 1 and Table 2 (please see Appendix 1) are achievement in the flipped classrooms; and perspectives, attitudes and motivations of the students towards flipped classrooms. The results of each part are displayed in detail below:

4.1. Achievement

27 of the studies compared the achievement scores of students in flipped classroom and traditional lecture-based classrooms. Accordingly, 25 studies exclusively reported that students taught by flipped classroom outperformed the ones taught by traditional lecture-based classrooms. Of these, 23 of them reported the statistical significance of their findings (Adnan, 2017; Akgün & Atıcı, 2017; Alsancak- Sırakaya, 2015; Aşıksoy& Özdamlı, 2016; Aydın, B., 2016; Boyraz & Ocak, 2017; Çakır, 2017; Çalışkan, 2016; Çetin- Köroğlu & Çakır, 2017; Ekmekçi, 2017; Güç, 2017; Göğebakan-Atıcı & Yıldız, 2016; Göğebakan-Atıcı, Yıldız & Altınbaş, 2016; Karaca & Ocak, 2017; Kurt, 2017; Sağlam, 2016; Sarıgöz, 2017; Şahin, Cavlazoğlu & Zeytuncu, 2015; Şengel, 2016; Turan, 2015; Tugun, Uzunboylu & Özdamlı, 2017; Umutlu, 2016; Zengin, 2017). In others, authors reported an increase in the average scores, yet did not report a statistical analysis investigating the significance of the observed difference (Özpınar, Yenmez & Gökçe, 2016; Sezer, 2016). Lastly, two studies found no significant difference in students' achievement scores (Aydın, G., 2016; Yavuz, 2016). On the other hand, one study examining three different achievement reports (midterm, portfolio, and essay scores) found no difference in flipped and traditional

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classrooms in two of them (midterm and portfolio grades), yet a significant difference in one area (essay scores) (Adnan, 2017).

4.2. Perspectives/ opinions/ views

25 of the studies examined learners' perspectives about the use of flipped classrooms. In terms of students' opinions related to flipped classrooms, positive opinions were stated in all the studies: *better preparation for the courses* (Akgün & Atıcı, 2017; Alsancak- Sırakaya, 2015; Aydın, B., 2016; Başal, 2015; Boyraz & Ocak, 2017; Çukurbaş & Kıyıcı, 2016; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016;Görü-Doğan, 2015; Özyurt& Özyurt, 2017; Şahin, Cavlazoğlu, Zeytuncu, 2015; Turan, 2015; Urfa & Durak, 2017; Yavuz, 2016; Yılmaz, 2017), *becoming active-learners in the classrooms* (Akgün & Atıcı, 2017; Alsancak- Sırakaya, 2015; Aşıksoy, Özdamlı, 2016; Başal, 2015; Çalışkan, 2016; Çukurbaş & Kıyıcı, 2016; Güç, 2017; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Şahin, Cavlazoğlu, Zeytuncu, 2015; Turan, 2015; Urfa & Durak, 2017; Yavuz, 2016; Yılmaz, 2017; Zeren, 2016) *more practice opportunities* (Adnan, 2017; Aşıksoy, Özdamlı, 2016; Çalışkan, 2016; Çukurbaş & Kıyıcı, 2016; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Kocabatmaz, 2016; Kurt, 2017; Turan, 2015; Zeren, 2016), *more real-life contexts* (Çalışkan, 2016), *socially and psychologically relaxed atmosphere and better less-stressful learning environment* (Çalışkan, 2016; Kurt, 2017;Tugun, Uzunboylu & Özdamlı, 2017; Yılmaz, 2017), *student-centered learning environment* (Alsancak- Sırakaya, 2015; Kurt, 2017; Urfa & Durak, 2017), *easy time-management* (Çalışkan, 2016), *more enjoyable classes* (Aydın, B., 2016; Kurt, 2017; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Şengel, 2016; Tugun, Uzunboylu & Özdamlı, 2017; Turan, 2015; Urfa & Durak, 2017; Yavuz, 2016; Yılmaz, 2017), *easy access to the materials* (Adnan, 2017; Alsancak- Sırakaya, 2015; Aşıksoy, Özdamlı, 2016; Çukurbaş & Kıyıcı, 2016; Kocabatmaz, 2016; Urfa & Durak, 2017; Yavuz, 2016), *self-pace learning* (Akgün & Atıcı, 2017; Aşıksoy, Özdamlı, 2016; Aydın, B., 2016; Başal, 2015; Kurt, 2017; Güç, 2017; Tugun, Uzunboylu & Özdamlı, 2017; Yavuz, 2016),*repetition of the content* (Alsancak- Sırakaya, 2015; Aşıksoy, Özdamlı, 2016; Çukurbaş & Kıyıcı, 2016; Kocabatmaz, 2016; Turan, 2015; Yavuz, 2016), *promotion of knowledge retention* (Akgün & Atıcı, 2017; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Görü-Doğan, 2015; Kocabatmaz, 2016; Kurt, 2017; Şahin, Cavlazoğlu, Zeytuncu, 2015; Urfa & Durak, 2017), *easier comprehension of the content* (Akgün & Atıcı, 2017; Boyraz & Ocak, 2017; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Güç, 2017; Kocabatmaz, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Özyurt& Özyurt, 2017; Tugun, Uzunboylu & Özdamlı, 2017; Zeren, 2016), *increase cooperation and interaction among peers* (Akgün & Atıcı, 2017; Aydın, B., 2016; Çalışkan, 2016; Çukurbaş & Kıyıcı, 2016; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Görü-Doğan, 2015; Güç, 2017; Kocabatmaz, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Turan, 2015; Yılmaz, 2017), *increase in self-confidence* (Adnan, 2017; Güç, 2017; Şahin, Cavlazoğlu, Zeytuncu, 2015; Tugun, Uzunboylu & Özdamlı, 2017; Yavuz, 2016), *increase in motivation* (Çukurbaş & Kıyıcı, 2016; Sezer, 2016; Şengel, 2016; Tugun, Uzunboylu & Özdamlı, 2017), *improvement in self-regulation, self-discipline and learner autonomy (*Adnan, 2017; Zeren, 2016), *better student-teacher interaction* (Akgün & Atıcı, 2017; Adnan, 2017; Çalışkan, 2016; Kocabatmaz, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Turan, 2015); with a few problems: *duration of the videos (*Adnan, 2017; Çukurbaş & Kıyıcı, 2016; Turan, 2015;), *limited time to the completion of the tasks (*Adnan, 2017; Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Kocabatmaz, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016; Yavuz, 2016; Yılmaz, 2017), *unfamiliarity to the method* (Kocabatmaz, 2016; Tugun, Uzunboylu & Özdamlı, 2017; Urfa & Durak, 2017), *computer and internet problems* (Aydın, B.,

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2016; Boyraz & Ocak, 2017; Çukurbaş & Kıyıcı, 2016; Görü-Doğan, 2015; Kocabatmaz, 2016; Tugun, Uzunboylu & Özdamlı, 2017; Tugun, Uzunboylu & Özdamlı, 2017; Turan, 2015; Urfa & Durak, 2017; Yavuz, 2016), not receiving immediate feedback (Göğebakan-Yıldız, Kıyıcı & Altıntaş, 2016; Özpınar, Aydoğan-Yenmez, Gökçe, 2016). Moreover, in one study, students stated that *traditional approach is more effective* (Aşıksoy, G. & Özdamlı, F., 2016).

4.3. Motivation

The results of the studies in terms of motivation showed that students taught in flipped classrooms have more motivations than students taught in traditional classrooms (Alsancak-Sırakaya, 2015; Aşıksoy& Özdamlı, 2016; Sezer, 2016; Özpinar, Aydoğan-Yenmez & Gökçe, 2016; Turan, 2015; Yılmaz, 2017). However, there was also increase in the motivation levels taught in traditional classrooms, and it is suggested that this may be caused by different motivation levels, and flipped classroom is still more effective in improving students' motivation levels compared with the traditional method (Sezer, 2016).

4.4. Attitudes

The results of the studies revealed that students in the flipped classrooms have positive attitudes towards flipped instruction (Ceylaner, 2016; Çetin- Köroğlu & Çakır, 2017; Ekmekçi, 2017; Sağlam, 2016; Yılmaz, 2017). The qualitative results showed that Flipped Writing Class Model is more enjoyable than traditional lecture-based writing classes (Ekmekçi, 2017), and a great deal of enjoyment in favor of flipped classroom was found out (Çetin- Köroğlu & Çakır, 2017; Ekmekçi, 2017; Yılmaz, 2017). However, two of the studies found no significant difference in students' attitudes towards the flipped classroom (Aydın, G. 2016; Güç, 2017).

4.5. Discussion of the findings

This systematic review highlights crucial findings on the current status of research on the flipped classroom in Turkey. In general, the results of this systematic review show that the number of studies focusing on flipped classrooms in the context of Turkey is increasing (16 of the studies were conducted in 2017, 17 of them were conducted in 2016, and 5 of them were conducted in 2015). Moreover, the results also display that studies are mostly conducted in higher education context (30 of the studies were conducted in higher education context, and 4 of them were conducted in secondary education, and lastly 4 of them was conducted in primary education context. The focuses of the studies are on the students' achievement in flipped classrooms in comparison with traditional lecture-based classrooms; students' perspectives on the use of flipped classrooms; and lastly the effect of flipped classrooms on students' motivation and attitudes towards the subjects and flipped classroom implementation.

In terms of the comparison of students' achievement in flipped classrooms and that in traditional lecture-based classrooms, the reviewed studies in Turkey have parallel results with the previous studies since they reported that students became more successful in flipped classrooms and there was an increase in their achievement scores. In the same way, the achievement scores (academic performance, academic achievement, learning gains, performance increase or exam-based scores) of students taught by flipped classrooms compared to students' scores in traditional lecture- based classrooms in international studies previously showed that students in flipped classrooms outperformed the ones in traditional classrooms (Deslauriers, Schelew & Wieman, 2011; Huang & Hong, 2015; Hung, 2015; Love et al., 2014; Marcey & Brint, 2011; McLaughlin &

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Rhoney., 2015; Stone, 2017). Similarly, the results of this review showed that students in flipped classrooms had higher scores than the ones in traditional classrooms.

Regarding students' perceptions/ opinions or views about flipped classrooms, the review displayed similar results since the previous studies reported that learning environment was taught to be more flexible (Kiat & Kwot, 2014; Mok, 2014; Simpson, Evans, Eley, & Stiles, 2003), it fosters peer interaction and cooperation (Bailey & Smith, 2013; Love et al., 2014; Talbert & Valley, 2012), students come to class prepared (Mok, 2014), they preferred flipped classroom over traditional methods (Butt, 2014; Gilboy, Heinerichs & Pazzaglia, 2015; Love et al., 2014; Roach, 2014), they developed a better comprehension of the content (Simpson & Richards, 2015). In terms of the disadvantages and limitations, studies reported that students found the lecture videos boring and long (Amresh, Carberry & Femiani, 2013; Olson, 2014; Ossman& Warren, 2014), they experienced technical problems related to the computers and internet connection (Everett, Morgan, Stanzione& Mallouk, 2014; Tague & Baker, 2014), and they had problems due to their lack of readiness and unfamiliarity to the method (Amresh et al., 2013; Bland, 2006; Margoniner, 2014; Talbert & Valley, 2012).

Concerning the effect of flipped classroom on students' motivation, the findings revealed that students' motivations were higher in flipped classrooms in comparison to the motivation increase observed in students in traditional lecture-based classrooms. These findings echo earlier studies in that flipped classrooms were reported as a promising method to increase students' motivation (Chen et al., 2014; Chen, Lui & Martinelli, 2017; Davies et al., 2013; Tune, Sturek & Basile, 2013).

Lastly, on the subject of students' attitudes, the findings demonstrated that students had positive attitudes towards flipped learning as they reported that they had more fun and felt less anxious as they got higher achievement and they assumed the classroom as a less stressful learning environment. The results were similar to the previous studies reporting that students hold positive attitudes (Marcey & Brint, 2011; Stone, 2012; Sun, 2017; Valeo, 2013).

5. Conclusion

Findings from this review suggest that flipped classrooms is an effective method compared to traditional lecture-based classrooms, particularly when the purpose is to increase students' achievement, to develop positive attitudes and to increase their motivation towards the course. Moreover, except from the technical problems students experienced, they mostly asserted positive opinions about the flipped classrooms. Since the profile of the learners is changing thanks to the integration of technology into our lives, the change in instructional materials and strategies is unavoidably necessary to get benefit most for the sake of learners' development. Therefore, there should be more studies implementing the flipped classroom in Turkish context by bearing in mind its benefits and advantages over traditional teaching methods.

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Appendix 1

Table 1. Research Studies on Flipped Classroom

	Author, Year	Purpose	Study Design	Sample		Major Themes
				Target Population	**N**	
1	Adnan (2017)	The impact of flipped classroom on academic outcomes, and the perceptions of students comparing to traditional lecture-based classroom	Qualitative :Action Research Quantitative data: students' grades Qualitative data: Open-ended course survey, journals, and focus group interviews	Pre-service senior English teachers	70 EG=31 CG=39	Achievement and perceptions
2	Akgün & Atıcı (2017)	The effect of flipped classroom on students' achievement and their views	Mixed: Quantitative: pretest-posttest quasi experimental design Qualitative: semi-structured interview	5th grade students	67 EG=35 CG=32	Achievement and perspectives
3	Aşıksoy & Özdamlı (2016)	The effect of flipped classroom on the achievement, motivation and self-sufficiency of students compared to traditional lecture-based classrooms; and students' opinions about flipped classroom	Mixed: Quantitative: pretest-posttest experimental design Qualitative: semi-structured interview	Pre-service sophomore CEIT students	66 EG=36 CG=30	Achievement, motivation, opinions, and self-sufficiency
4	Başal, A. (2015)	The perceptions of students, and the implementation of flipped classroom in English language teaching	Qualitative: Open-ended questions	Pre-service teachers at the Department of English Language Teaching	47	Perceptions
5	Boyraz & Ocak (2017)	The effect of flipped classroom/education on academic success and knowledge retention, and students' opinion about this approach	Mixed: Quantitative: quasi-experimental method with pretest-posttest control group design Qualitative: focus group interviews	Preparatory class students	42	Achievement, knowledge retention, opinions

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6	Çelebi, Karaaslan & Demir-Vegter (2016)	The identification of students' views on flipped learning	Mixed: Survey Quantitative: 24-question Likert scale Qualitative: open-and guided reflection papers	Pre-service freshman English teachers	18	Views
7	Çetin-Köroğlu & Çakır (2017)	The effects of flipped instruction on the speaking skills development and learners' attitudes towards flipped classrooms	Quantitative: Quasi-experimental pretest-posttest experimental design	Pre-service freshman English teachers	48 EG=23 CG=25	Achievement and attitudes
8	Çukurbaş & Kıyıcı (2016)	To examine pre-service teachers views regarding teaching activities carried out by using flipped classrooms	Qualitative: case study- Open-ended questionnaire	Pre-service science teachers	15	Perspectives
9	Ekmekçi (2017)	The impact of flipped instruction on students' writing performances compared to traditional methods, and students' attitudes towards the method	Mixed: Quantitative: pre-test-posttest true experimental design Qualitative: semi-structured interview	Preparatory class students	43 EG=23 CG=20	Achievement and attitudes
10	Göğebakan-Yıldız & Kıyıcı (2016)	The effect of flipped classroom on students' achievement, metacognitive awareness, and epistemological beliefs	Quantitative: non-equivalent control group design	Prospective science teachers	66 EG=32 CG=34	Achievement, metacognitive awareness, and epistemological beliefs
11	Göğebakan-Yıldız, Kıyıcı & Altıntaş (2016)	To analyze the effect of flipped classroom on students' achievement and their perspectives about the model	Mixed: Quantitative: Achievement Qualitative: semi-structured interview	Pre-service freshman chemistry teachers	39 EG=21 CG=18	Achievement and perspectives
12	Görü-Doğan (2015)	To investigate the perspectives of students on the use of flipped classroom	Qualitative: Action research	Undergraduate students taking Basic Computer Skills course	8	Perspectives
13	Karaca & Ocak (2017)	To investigate effects of flipped learning on university students' achievement	Quantitative: Quasi-experimental design	Students at the Departments of Mechanical	220 ME: EG=80 CG=80	Achievement

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				Engineering (ME) and Computer Programming (CP)	CP: EG=30 CG=30	
14	Kocabatmaz (2016)	To investigate the perspectives of pre-service teachers regarding flipped classroom model	Qualitative: Case study Semi-structured interview	Pre-service teachers at the Department of English Language Teaching	21	Perspectives
15	Kurt (2017)	The implementation and effectiveness of flipped classroom comparing to traditional lecture-based classroom in terms of students' self-efficacy beliefs, learning outcomes, and their perspectives	Mixed: Pretest-Quantitative: Posttest quasi experimental design Qualitative: Focus group interview	Pre-service senior English teachers	62 EG=32 CG=30	Self-efficacy beliefs, achievement, perspectives
16	Özpınar, Aydoğan-Yenmez & Gökçe (2016)	The effect of flipped classroom on the academic achievement and motivation of the students and determination of students' opinions on the method	Quantitative: Quasi-experimental method	Sophomore students at Elementary Mathematics Education Program	50	Achievement, motivation, and opinions
17	Özyurt & Özyurt (2017)	The views of students about enriching programming and algorithm teaching with flipped classroom approach	Qualitative: Semi-structured interview	Freshman students at the Department of Software Engineering	32	Opinions
18	Sarıgöz (2017)	The effect of flipped classroom on the academic success	Quantitative: Pretest-posttest experimental design	Pre-service sophomore Elementary Teacher Education students	68 EG=34 CG=34	Achievement
19	Sezer (2016)	The effect of the application of the flipped classroom method on the ac-	Mixed: Quantitative: pre-test-posttest experimental design	6th grade students in studying at 2	68 EG=35 CG=33	Achievement, motivation and opinion

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		ademic achievement and motivation of the students; and exploring students' opinions	Qualitative: Structured Interview	separate classes		
20	Şahin, Cavlazoğlu. & Zeytuncu (2015)	College students' views on flipped courses and investigate how the flipped effects their achievement in mathematics comparing to traditional classroom	Qualitative: Case study	College students	96	Achievement and views
21	Şengel (2016)	The effectiveness of flipped classroom approached, when coupled with problem-based and cooperative learning compared to traditional classrooms; its' effects on achievement; and students' perception of the flipped classroom format	Mixed: Quantitative: pre-test-posttest quasi experimental method Qualitative: Survey- closed and open ended questions	Pre-service sophomore CEIT students	96 EG=41 CG=55	Achievement and perception
22	Tugun, Uzunboylu & Özdamlı (2017)	The influence of flipped classroom model on digital game development and students' views on the model	Quantitative: Experimental research with pre-test-posttest	9th grade students	52 EG=28 CG=24	Achievement and opinions
23	Urfa & Durak (2017)	To determine students' views about the use of flipped classroom	Mixed: Quantitative: descriptive statistics Qualitative: observation, interview and focus group interview	Senior CEIT students	24	Perspectives
24	Yılmaz, R. (2017)	The exploration of e-learning readiness on students' satisfaction and motivation in flipped classrooms	Quantitative: Correlational research	Undergraduate students from the Departments of Science teaching, Social Science teaching and Islamic sciences	236	Motivation

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25	Yılmaz, Ö. (2017)	The usability of flipped classrooms in higher education: students' opinions and attitudes	Mixed: Quantitative: posttest Qualitative: focus group interview	Students at Department of Primary Education	31	Opinion and attitudes
26	Zengin (2017)	The effect of flipped classroom approach on students' academic achievement and students' views about this approach	Mixed: Quantitative: Single group pretest-posttest design Qualitative: Open-ended questionnaire	Students at Department of Mathematics Education	28	Achievement and views
27	Zeren (2016)	To examine students' perceptions on the benefits of flipped classrooms	Mixed: Quantitative: Survey Qualitative: Observation	Students at the Faculty of Science and Literature	135	Perceptions

Table 2. Master's Theses and PhD Dissertations on Flipped Classroom

	Author, Year	Purpose	Study Design	Sample		Major Themes
				Target Population	**N**	
1	*Alsancak & Sırakaya (2015)	The effect of flipped classroom on academic achievement, self-directed learning readiness, and motivation, and students' perspectives towards the method	Mixed: Quantitative: Qualitative:	Pre-service senior students at Psychology and Counselling Department	66 EG=32 CG=34	Achievement, motivation and perspectives
2	Aydın, B. (2016)	The effect of flipped classroom on students' academic achievement, homework stress level and their transfer of learning along with identifying students' views about the method.	Mixed: Quantitative: pretest-posttest quasi experimental design Qualitative: semi-structured interview	Pre-service sophomore CEIT teachers	44 EG=24 CG=20	Achievement and perspectives
3	Aydın, G. (2016)	The effect of flipped classroom on university' students' attitudes, self-efficacy and academic achievement	Mixed: Quantitative: pretest-posttest control group true experimental design Qualitative: interview	Pre-service CEIT teachers	33 EG=15 CG=18	Achievement and attitudes

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			questions+ individual interviews			
4	Ceylaner (2016)	The effects of flipped classroom on students' self-directed learning readiness and attitudes towards the lesson	Quantitative: Quasi experimental study	9th grade students	46 EG=23 CG=23	Attitudes
5	Çakır (2017)	The impact of flipped classroom applications on students' achievement, cognitive risk taking skills and computational thinking skills	Quantitative: pretest- posttest quasi experimental design	7th grade students	53 EG=26 CG=27	Achievement
6	Çalışkan, N. (2016)	The influences of flipped classroom on students' learning, and their perspectives on the flipped classroom	Mixed: Quantitative: pretest-posttest design Qualitative: observational field notes, focus group interviews, semi-structured interviews	Preparatory class students	22	Achievement and perspectives
7	Güç (2017)	The effect of flipped classroom on students' academic achievement ad their attitudes towards the course; and students' opinions about the method	Mixed: Quantitative: quasi-experimental pretest-posttest experimental design Qualitative: semi-structured interview	7th grade		Achievement, attitudes and opinions
8	Sağlam (2016)	The effect of flipped classroom on students' achievement and their attitudes towards the method	Quantitative: non-equivalent pretest-posttest experimental design	Preparatory class students	56 EG=29 CG=27	Achievement and attitudes
9	* Turan (2015)	The impact of flipped classrooms on students' achievement, cognitive load and motivation; and students' perspectives about	Mixed: Quantitative: quasi-experimental design Qualitative: student view questionnaire and semi-	Pre-service teachers at Early Childhood Education Department	116 EG=58 CG=58	Achievement, motivation and perspectives

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Tütüncü, N. Aksu, M. (2018). A systematic review of flipped classroom studies in Turkish education. *International Journal of Social Sciences and Education Research*, 4(2), 207-229.

		flipped classrooms	structured interview			
10	Umutlu (2016)	The effect of flipped classroom on students' writing achievement in an English course, and the interplay effects of students' learning styles, autonomy levels, and critical thinking disposition levels	Quantitative: quasi-experimental pretest-posttest design	Preparatory class students	127 EG=15 EG=18 EG=20 EG=27 EG=21 EG=17 CG=18	Achievement
11	Yavuz (2016)	The effect of flipped classroom on students' success and their feedback regarding its application	Mixed: Quantitative: pretest-posttest experimental design Qualitative: focus group interview	10th grade students	27 EG=13 CG=14	Achievement and perspectives

* = PhD Dissertation EG = Experimental Group CG= Control Group

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