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Flipped classroom approach

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Abstract

Flipped classroom is an active, student-centered approach that was formed to increase the quality of period within class. Generally this approach whose applications are done mostly in Physical Sciences, also attracts the attention of educators and researchers in different disciplines recently. Flipped classroom learning which wide-spreads rapidly in the world, is not well recognized in our country. That is why the aim of study is to attract attention to its potential in education field and provide to make it recognize more by educators and researchers. With this aim, in the study what flipped classroom approach is, flipped classroom technology models, its advantages and limitations were explained.

Keywords: Flipped learning, flipped classroom, new approaches

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1. Introduction

In the century we are in, rapidly developed technologies affect education training fields as they do in all fields. In parallel to the speed of development in technology, education conditions develop as well and different learning demands come out (Celen, Celik, & Seferoglu, 2011). In order to compensate these demands that come out with this transformation, are among the prior responsibilities of education systems. That is why a qualified education system should not limit learning and transform traditional structure into modern structure with technological opportunities (Bas, 2010; Rakhmetullina & et al, 2014). As changing in knowledge and technology is so fast, education also keeps up with it and continues its development with innovative learning approaches (Akdemir, Bicer & Parmaksiz, 2015; Ugras & Cil, 2014; Schaal, 2010). This changing and transformation in education training field takes out the existence of new strategy that is flipped classroom system in education (Toto & Nguyen, 2009). Flipped classroom approach which is accepted as the most popular and active based approach (Tucker, 2012), is a special type of blended learning (Strayer, 2012). This approach firstly attracted attention of educators in 2007 with chemistry teachers Jonathan Bergmann and Aaron Sams from Woodland Park High School recording of live lessons and broadcasting them on-line for the students that missed those lessons (Bergmann & Sams, 2014). The main aim of this new learning approach is to provide preparation of student for the subject before the course (Bristol, 2014) and during course applying activities that increase the quality of face to face education (Formica et al., 2010).

There are many definitions regarding flipped classroom in literature. According to Bishop and Verleger (2013) flipped classroom is a student-centred learning method consisting of two parts with interactive learning activities during lesson and individual teaching bases directly on computer out of lesson. Mull (2012) defined it as a model that provides students prepare themselves for the lesson by watching videos, listening podcasts and reading articles. According to Milman (2012) it is an approach aims the efficiency of lessons by transferring knowledge to students via videos and vodcasts as well as by discussions, group works and applications during course. Toto and Nguyen (2009) expressed that flipped classroom is an approach that increases active learning activities and gives opportunity for student to use his knowledge in class with guidance of teacher. Hamdan and others (2013) explained flipped classroom is not a defined model instead it is a model that teachers use as compensating the demands of students by using different equipments. Since the educators in different countries use flipped classroom with various methods, this caused changing of flipped classroom concept to flipped classroom approach. It is emphasized that this new approach can be used with different learning methods (Flipped Learning Network-FLN, 2014).

In literature there are many studies regarding the usage of flipped classroom approach and its results in many fields such as Science (Kenna, 2014; Kettle, 2013; Bates & Galloway, 2012), Maths (Love, Hodge, Grandgenett & Swift, 2013) and Healthcare training (Pluta, Richards, & Mutnick, 2013; Critz & Knight, 2013; Ferreri & O'Connor, 2013).

2. Flipped Classroom Approach

With its simplest definition flipped classroom approach is expressed as “what is done at school done at home, homework done at home completed in class” (Sams & Bergmann, 2014).

In this approach before the course the students watch theoretical part of lesson via multiple equipments such as online videos, presentations, learning management systems and take notes, prepare questions about the parts that they do not understand (Kim, Kim, Khera, & Getman, 2014). During course they achieve supporting activities such as finding answers together to the questions they prepared before lesson, group working, problem solving, discussion and making an inference (Formica & et al, 2010). Flipped classroom is an approach that transfers learning responsibility from teacher to the student (Bergmann, Overmyer & Wilie 2011).

Flipped classroom approach has four different elements. It is expressed that in order to teachers achieve this approach, they have to take this four element into consideration (FLN 2014). The properties of this approach which its English correspondence is “Flip” are explained like this by referring first letters:

- F (“F”lexible Environment): It indicates provision of time and place flexibility of learning.
- L (“L”earning Culture): In traditional teacher centered approach the source of knowledge is teacher. In flipped classroom approach there is transition from teacher centered approach to student centered approach.
- I (“I”ntentional Content): Flipped classroom educators both think about how education is used to provide fluency and how they can develop cognitive understanding of students.
- P (“P”rofessional Educator): The responsibility of flipped classroom educators is more than the ones using traditional approach. Flipped classroom educators continuously observe students during the course, evaluate their studies and make feedbacks (Flipped Learning Network -FLN, 2014).

2.1 What is or what is not Flipped Classroom Approach?

Bergmann, Overmyer & Wilie (2011) made explanations below about what is or what is not flipped classroom approach; Flipped classroom approach is a system that provides increase interaction time between the teacher and the student, presentation of a condition in which students take their own learning responsibilities, transition of role of teacher into a guidance, blending of constructivist learning with teaching method, each student taking individual education, consistency of learning by repetitions and preventing students to keep behind of class that cannot come to class for any reason.

Flipped classroom approach is not synonym with online videos, the important point is the interactive activities done during time when teacher and students are face to face. It is not using video instead of teacher. It is not working unsystematically of students. It is not students spending all course period in front of a computer. It is not a student studying alone.

2.2 Technology of the flipped classroom

In order to apply flipped classroom model it is not necessary to be a professional video producer, it is possible to use any source that explains the subject (PDFs, recorded sounds, websites). Although Tucker (2012), expressed that flipped classroom educators are not needed to prepare their own videos instead they can reach lecture videos from internet sites such as Khan Academy, YouTube or Ted, most of the educators and researchers prefer to prepare their own videos. Some equipments that are necessary to form and broadcast lecture videos, are presented below;

Video forming equipments: Some of them are; [Screen-Cast-O-Matic](#), [Camtasia PC](#), [TechSmith Relay](#), [Office Mix](#), [Adobe Presenter](#).

Video Hosting: After forming the video, it should be placed online for access of students. Some of video sites are; YouTube, TeacherTube, Screencast.com, Acclaim, GoogleDrive.

Video interaction Softwares: These are softwares that provide teachers to access some information such as which student watched which lecture video, how long he watched, how he answered the questions in the video. Some softwares that can be given as example are; [EduCanon](#), [EdPuzzle](#), [Zaption](#), [Office Mix](#), [Verso](#), [TechSmith Relay](#), [Adobe Presenter](#), [Google Apps for Ed](#)

Learning Management: As created videos can be sent to video hosting site, they can be presented to access by using learning management system (LMS). LMS are not only broadcast videos, they can

also provide interaction with students. Moodle, Sakai, Blackboard, [VersoApp](#), [Schoology](#), canvas, [My Big Campus](#), [Haiku Learning](#), Google Classroom can be given as examples for learning management systems (LMS).

2.3 The Role of Teacher

The most important factor in flipped classroom approach is the role of teacher (Bergmann & Sams, 2012). The roles of flipped classroom educators are presented below;

- Creating learning condition based on questioning (Bergmann & Sams, 2012)
- Instead of transferring knowledge directly, being a guide to make learning easy (Johnson & Renner, 2012)
- Making one to one interaction with students (Cohen & Brugar, 2013)
- Correcting misunderstandings (Bergmann & Sams, 2012)
- Individualizing learning for each student (Schmidt & Ralph, 2014)
- Using technological equipments suitable for learning condition (Fulton, 2012)
- Creating interactive discussion conditions (Millard, 2012)
- Increasing participation of students (Millard, 2012)
- Sharing lecture videos as out of class activity (Bishop & Verleger, 2013)
- Providing feedback by using pedagogical strategies (Nolan & Washington, 2013)

2.4 The Role of Student

In flipped classroom approach student transforms from passive receiver of knowledge to active promoter of knowledge. In this approach the roles of students are expressed below;

- Taking their own learning responsibilities (Bergmann & Sams, 2012),
- Watching lecture videos before the course and preparing for the course by using learning materials (Milman, 2012)
- Learning at his own learning speed (2012)
- Making necessary interactions with his teacher and friends, taking and giving feedback (Tucker, 2012).
- Participating discussions within class (Overmyer, 2012).
- Participating team working (Formica, Easley, & Spraker, 2010).

3. Flipped classroom models

In order to apply flipped classroom approach, there are different models. If the condition of class is taken into consideration in choosing these models, the results will be more effective (Bajunury, 2014).

3.1 Traditional Flipped Classroom Model

Bergmann & Sams (2012) explained traditional flipped classroom model as “what is done at school done at home, homework done at home completed in class”. In traditional flipped classroom approach students come to class by watching the lecture video of previous night. The lesson starts with short questions and answers. If there are points in lecture that are not understood, they are explained comprehensively. In the rest of time, the teacher makes activities based on questioning and gives one to one support to students. In this kind of class structure, the lessons are always given as lecture video format out of course period and the teacher never teaches lesson directly. Accordingly students are given opportunity to learn by discussing. In this approach not a teacher centered class but a student centered class is in question and the teacher is in class as just a guide. In flipped classroom approach time is restructured. However in traditional approach teaching of subject takes the most of course time (Bergmann & Sams, 2012). Class activity periods in traditional approach of Bergmann & Sams (2012) and class activity periods in flipped classroom approach are given in Table 1.

Table 1. Comparison of within class activity periods of traditional approach and flipped classroom approach

| Traditional Classroom | Time | Flipped classroom | Time |
|--------------------------------------|-----------|--------------------------------------|--------|
| Warm up | 5 min | Warm up | 5 min |
| Homework checking of previous lesson | 20 min | Answering lecture video questions | 10 min |
| Teaching of new subject | 30-45 min | - | - |
| Exercises or laboratory applications | 20-35 min | Exercises or laboratory applications | 75 min |

3.2 Partial Flipped Classroom Approach Model

Partial flipped classroom structure is the less strict of traditional flipped classroom structure (Bajunury, 2014). Gwyneth Jones made the perfect application of partial flipped classroom model in Murray Hill Secondary School. Jones encouraged his students watching the videos out of course period (Springen, 2013), in addition to this he did not punish the ones that they could not watch the videos or the ones that could not watch because of lackness of equipment (Springen, 2013). Although Jones expressed his method as flipped classroom, this method is the part of traditional flipped classroom model of Sams and Bergman (2012) (Bajunury, 2014).

3.3 Holistic Flipped Classroom Model

Chen, et al (2014) added 3 structures (Progressive Activities, Engaging Experiences, and Diversified Platforms) to four structures of flipped classroom approach (Flexible Environments, Learning Culture, Intentional Content, and Professional Educators) and formed Holistic Flipped Classroom (HFC) model. Holistic Flipped Classroom is a model that contains total of home, mobile and physical classrooms synchronously. In contrast to traditional flipped classrooms where students are only supervised by instructors in the physical classroom and their home activities are not recorded and monitored, and hence cannot be analyzed, all learning spaces in HFC are treated as classrooms because all of them are supported and monitored. By logging on to the platform in HFC, students can preview/review course lectures, attend synchronous class sessions, discuss course content with the instructor and with

classmates, and offer reflections. All these tasks can be done seamlessly, and all their learning activities are recorded in the platform's system log. The lessons that has to be watched and materials that has to be examined before each synchronous class could be conducted in one of the Mobile or Cloud or Asynchronous classroom environments. To attend the synchronous class students would log in to the learning platform and conduct synchronous classroom activities under the instructor's guidance. In the synchronous classroom, the instructor could require the students to conduct various hands-on activities, such as conducting research on Cloud, uploading reports to the asynchronous classroom or taking online quizzes. Figure 1 shows the working of Holistic flipped classroom model.

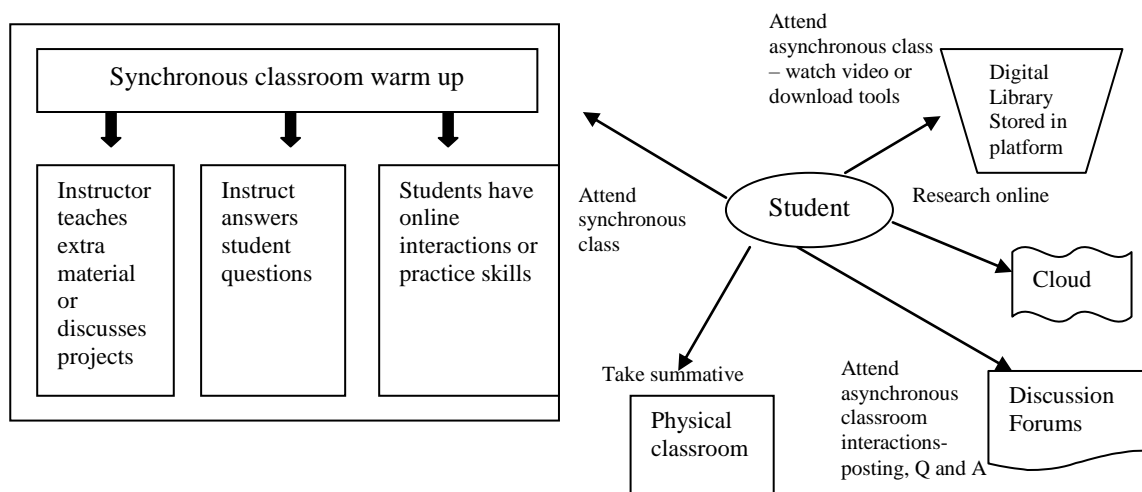


Fig. 1. Holistic Flipped Classroom Model

4. The Advantages and Limitations of Flipped Classroom Approach

4.1 Advantages

There are many advantages of flipped classroom approach. The most important one is it increases the interactive period within the class (Fulton, 2012). By means of lecture videos the teacher uses the time for the interaction between teacher and student rather than for teaching. Accordingly the teacher can spare more time to fulfill the learning and emotional demands of students (Goodwin & Miller, 2013). In flipped classroom approach the students can find opportunity to discuss with their teachers which is not a possible situation in traditional approach (Bergmann & Wadell, 2012).

According to Milman (2012) the most important benefit of flipped classroom approach is to support team working within class. The advantages that Fulton (2012) expressed are; students can access lecture videos whenever and wherever they want and it provides students to learn at their own speed. The students that are educated with this approach are encouraged to think both within and out of class (Kellinger, 2012). Since it is available to be used with various teaching strategies is the other positive side of the approach (Love, Hodge, Grandgenett & Swift, 2013). Parents can follow the courses of students and provide them to help their children is another advantage of it (Goodwin & Miller, 2013). In addition to all these advantages Herreid and Schiller (2013) reported that flipped classroom approach provides students more time to make inventive researches.

4.2 Limitations

Despite all these positive sides, in literature there are negative opinions about the method. Students may be stubborn at the beginning and may come to class without preparation. Also lecture

videos should be prepared carefully in a way to prepare students for the course. It is hard to prepare such good quality videos and it takes time (Herreid & Schiller, 2013). Springen (2013) expressed that teaching design models that are going to be applied during approach, are limited.

Kordyban and Kinash, (2013) attracted attention to the point as a difficulty that how teachers are certain of that the students do their responsibilities out of class well and Bristol (2014) expressed the difficulties in case the students come to class without preparation. Also the obstacles that prevent the usage of approach are expressed as students are lack of equipments such as smart phones, tablets or computers and having internet problems (Kordyban & Kinash, 2013).

The biggest disadvantage for teachers is not preparing or broadcasting lecture videos but preparing within class activities and integrating them to flipped classroom approach. In contrast to what is known, this method increases the duty of teachers instead of relieving (Lafee, 2013).

5. Conclusion and Future Work

In order to compensate the educational demands of 21st century students, it is important to use innovative approaches in education. Since the number of researches regarding flipped classroom approach increasing day by day in the world, the number of researches regarding this approach is just a few in Turkey and this makes us think that the approach is not well known. This study can attract attention of educators about the potential of approach and can form a point of view how to use it in their courses. For expanding of flipped classroom approach in educational institutions, it is thought that the approach has to be cognitively and practically presented. Accordingly the skills of teachers in designing materials by using multiple equipments and to transform these materials with learning management systems, have to be developed. The positive development in desire, interest and motivation of educators using technological equipments will be effective in spreading of this approach. In future studies the applications of flipped classroom approach in different education levels can be analysed.

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