



FLIPPING THE DRAWBACKS OF FLIPPED CLASSROOM: EFFECTIVE TOOLS AND RECCOMENDATIONS

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Abstract

Although flipped classroom is a new pedagogical model, it has emerged frequently in recent years. In this model, low level skill 'knowledge acquisition' is allocated to the students. Such activities that require high-level skills as application and problem solving are carried out under the guidance of teacher. When the relevant literature reviewed, many studies examining the definition, advantages and disadvantages of this model, experimental studies and model applications have been found. However, such resources compiling and introducing tools can be used to make the flipped classroom model effective and overcome disadvantages.

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The present study provides information about the tools which can be used in any stage of the flipped classroom model and introduce these tools in detail with the aim of filling the deficiencies. Moreover the selected instruments are evaluated in terms of their compatibility with mobile technologies. Literature review method was used in the study. In this context, particularly disadvantages of the model have been identified in the literature area and it addressed the means to overcome these limitations. Also, content analysis data that were compiled between the years 2010-2015 was carried out in the framework of flipped classroom models are also used in this study. This aspect of the research is like a guide that enables flipped classroom enhanced by mobile technologies which are necessary for learning in times of need, time and place independent. Through offered mobile learning-oriented information, learner's needs will be met. In this context, tools for eliminating the disadvantages of this model discussed in the relevant literature are selected in particular. It is expected that this study takes a guide role for the educators who want to apply flipped classroom model.

Keywords: Flipped Classroom, Learning tools, Web-based tools, Mobile technologies.

INTRODUCTION

Traditional education has started to become inefficient due to the changing needs of individuals in 21st century. The integration of technology into the pedagogic models developed for these needs of individuals has almost become compulsory. Flipped classroom model is one of these models that has been developed as new methods have been required in order to fulfill the needs for higher order skills in the learners' lives (Sams & Bergmann, 2013). This is a new pedagogic model which leaves the responsibility of learning –lower order skill– to the learner and requires higher order skills such as practice and problem-solving to be handled in the class under the guidance of the teacher. In this way, contrary to traditional education, teachers create new environments in which students can enhance their practical skills, abilities to transfer new knowledge,

productivity, cooperation and interaction skills and do group work (Missildine, Fountain, Summers & Gosselin, 2013). Flipped classroom model has two phases. In the first phase learning takes place individually with the help of technology outside the class, while in the second phase learning occurs with communicative group activities inside the class (Bishop & Verleger, 2013). Homework in traditional education turns into in-classroom activities in this model. As In this study, a comprehensive literature review was conducted by the researchers. Several experimental studies demonstrate that this model has positive effect on academic achievement, motivation, problem solving skill and application skills, critical thinking skills, self-efficacy, attendance, perceptions and attitudes.

Flipped classroom model has disadvantages just as many pedagogic methods. Some of the disadvantages indicated in literature can be listed as follows. First of all, learners who adopted traditional education may resist to this new model (Herreid & Schiller, 2013). Developing or supplying communicative classroom materials such as videos during the implementation process of the model can be found too demanding by the teacher or instructional designers (Effield, 2012). Researchers (Ash, 2012; Riveraa, 2015; Sams & Bergman, 2013; Thoms, 2012) have stated some of the problems that teachers encounter in this model. Teachers can be suspicious about whether the students are watching the videos or not and may find interaction during the individual learning processes insufficient. Also, the students who come to school without watching the course content while others are doing the in-classroom activities and students' different speed rates in the activities can be problematic for the teachers, since while the early finishers will get bored, the others may feel frustration. Moreover, teachers may have doubts about whether students acquired the new knowledge during the video sessions because of insufficient feedback.

The Current Study

The aim of this study is to present materials and effective recommendations in order to eliminate the disadvantages of flipped classroom model stated in the literature. Unlike many other pedagogic models, flipped classroom model requires technology integration particularly communicative video materials. As a result of the literature review, several experimental research conducted on various sample groups have been encountered. However, studies have been found to be insufficient in terms of compiling and introducing the materials to make flipped classroom model effective and eliminate the disadvantages. Based on this deficiency, various materials are introduced below in order to guide teachers who want to use flipped classroom model and researchers who study this model. These materials are evaluated according to their compatibility with mobile devices. These tools have been identified with content analysis method from the studies conducted on flipped classroom model between the years 2010 and 2015. Along with this data, some other materials that are found to beneficial for the researchers are introduced and their features are presented.

In this study, the related literature has been reviewed in order to identify the disadvantages of flipped classroom model. The use of technology has been foreseen to eliminate these disadvantages and effective tools have been compiled. In the selection of these effective tools, research done between the years 2010-2015 have been reviewed and content analysis has been conducted. The key words "Flipped Classroom", "Flipped Education" and "Flipped/Inverted Learning" were used in the search from ProQuest Dissertations and Thesis Full Text Data Base, and Turkey Thesis Catalogue. As a result of the search 28 MA and PhD thesis - written in Turkish (f=2) and English (f=26) - were reached. Tools used for various reasons such as constructing course content, sharing course content, evaluation, enhancing interaction, reinforcing knowledge and increasing the interaction between peers as well as students and teacher are shared. The frequencies of these tools have been calculated according to the studies previously used. The frequencies of these tools are presented in the Table 1.

As a result of literature review and content analysis, the tools used in this model have been examined under four sub-titles: Content preparation process, source searching process to access the course contents, content sharing process and providing Interaction

Table 1: Content Analysis Data: Tools Used in Flipped Classroom Model

Process	Tool	Frequency
Source searching	TED Talks	3
	Khan Academy	4
	TeacherTube	1
	Bright Storm	1
Content Preparation	Camtasia Studio	8
	PowerPoint	7
	Screencast-O Matic	3
	PDF Converters	2
	Prezi	2
	SmartRecorder	1
	ShowMe	1
	Educreations	1
	GoAnimate	1
Content Sharing	YouTube	6
	Podcast&Vodcast	6
	Google Docs	4
	Blackboard	3
	Moodle	3
	Dropbox	2
	Sakai	1
	Schoology	1
	Canvas	1
	Edmodo	1
	Google Hangout	1
Providing Interaction	Quiz Applications	16
	MyMathLab	1

The tools that are found to be appropriate to the model have also been presented in the table along with the other tools. Process-driven investigated studies have been stated with suggestions. In the current study, tools and suggestions were given under two sub-titles: A) content preparation and B) content sharing. The tools given in the table that are used for different aims have been presented by integrating them under these two processes.

A. The Process of Course Content Preparation

In this process, teachers prepare course content that provides learner acquiring the necessary knowledge before the lesson. These contents can mostly be videos as well as interactive presentations and source links explaining the subject. Suggestions for the teacher in this process and tools have been presented below.

One of the main conditions of the course efficiency is the *sufficiency of sound and image quality* of the video. Poor sound and low resolution may obstruct the perception and cause distractibility in students. *Interactivity in videos is important*, because the aim of flipped classroom model is not just shooting course videos, but also increasing the participation levels of students to the highest levels (Bergmann and Sams, 2014). It is necessary to *highlight the important expressions with various tools* in course content during this process. It is possible to feature the important points with different shapes, colors and fuzzification techniques. *The display of course content on mobile devices* can make the learning process more fruitful by setting it free from time and place. The learning process is individualized as a result of supporting flipped classroom model with mobile learning and the interaction between learner-teacher and learner-learner is reinforced (Al-Fahad, 2009). The teacher can make use of many tools in the market while preparing the course content by providing the conditions. However, in this study, the tools that got most attraction have been included based on their download frequencies.



A.1. Camtasia Studio

Camtasia Studio is used to record the teacher's computer screen. Via this software learning elements can be more effective with background images, motion graphics, speech bubbles, zooming, to enrich content. With various elements such as table of contents, links, search button and questions it is possible to make interactive course content (E-Data, 2013). For more efficient learning, it is crucial to watch the video prepared in many devices. Prepared with Camtasia Studio videos can be viewed on different devices. Also these contents can be shared on different platforms. Camtasia Studio is a paid software developed by TecSmith company. However, 30-day trial version is available.

A.2. Adobe Captivate

This software is a tool that can be used to prepare interactive e-learning content is compatible with many devices. It may be preferable for teachers using the flipped classroom model aspect to allow mobile learning and interactive content preparation. This software can convert Microsoft PowerPoint presentation to HTML5-based e-learning content. Due to prepare quizzes and interactivity options, this software may prefer by trainers who use flipped classroom model. Adobe Captivate allows projects to be published in various media such as Youtube, desktop and learning management systems (LMS). This software provides opportunities for high-resolution recording will avoid possible attention disorders among students following the course.

A.3. Screencast- O- Matic

Unlike other screencasting softwares, Screencast-O-Matic allows teachers online video recording without installing setup. Because of the ease of use, it may be preferred by the person who prepares the course content. This platform is free for 15-minute videos. Bergman and the Sams (2013) stated that video contents should be given in simple and presented in an understandable format. From this point video should not be too long. If the content is long, video content should be divided into short pieces. When all this is taken into account, free time offered by this software will be sufficient. Also, Screencast-O-Matic allows high-resolution video to be posted on Youtube easily. Some of the possible situations that may prevent the processing effectively the flipped classroom model are file size and server capacity. However, Screencast-O-Matic can share videos YouTube. This will provide following lessons on different platforms anywhere with internet access. So it is sufficient just sharing the link.

Moreover, to eliminate limitations such as file size and server capacity, teachers may share contents in different formats. For example, related pictures can be saved in the pdf or image format with screenshot tools. Many software can be found on the market. Some of them listed below. They allow users to add highlighting and guidance on screenshot photos. The more widely used of these devices are discussed below.

A.4. Screen Shoot Mobile Applications

Screenshot mobile applications on derivatives on the market can take the display screen of the mobile device and share on various platforms. Thus, trainers can provide rapid feedback to students in the flipped classroom implementation process. These tools may be preferable to increase the applicability of flipped classroom model on the mobile environment.

A.5. Lightshoot Desktop Application

Unlike many screenshooting software, it allows users to add highlight and orientation elements. Also Lightshoot converts contents to online connections. In this way teachers can share these links with students easily. The software is free and can run on Mac and Windows operating systems. It is not necessary to install.

A.6. Educreations

Educreations can be preferred to increase the interactivity and mobility properties of flipped classroom model. Image of the interactive whiteboard screen can be saved with this mobile application.

Teachers can create course content quickly with some features such as voice recording, listening again, drawing and handwriting. In addition, learning contents can be shared on Dropbox, Google Drive, social networks. Educreations provides the safety of the data through cloud system (Educreations, 2015). This software can be



downloaded for free but it has also professional version for different features. Easy simple interface offers the possibility of practical use. The limitation of this application is only available on iOS support.

B. Identifying Learning Platforms for Access to Course Contents

At this stage, the teacher chooses the best platform for his/her teaching strategy in order to make the lesson more effective and ensures the students enroll the platform. It is important to be careful about the **accessibility of the system from different platforms** and have a **plain and user-friendly interface**. It is necessary to adjust active teaching methods effectively to these settings when the effect of methods used in teaching on achievement is taken into consideration during the process of knowledge acquisition via these platforms (Gülbahar & Kalelioğlu, 2009). From this aspect, choosing the systems that enable **creating question-answer platforms** will provide teacher-student and student-student interaction. In order for evaluation, the most important phase of the system, it should be paid attention that the system has evaluation tools. The identification of whether the target outcomes have been reached at the end of the model (Bozkurt, 1995), and controlling the productivity during the process are important for evaluation. Various platforms and tools have been evaluated taking these conditions into consideration in order to guide teachers in this process.

B.1. Edpuzzle

EdPuzzle, which can be used for both content preparation and sharing, is an online platform that helps you make your videos prepared for the lesson more effective and beneficial. Teacher can add sound to the video as well as recording his/her own voice on it. Moreover, it is possible to add questions to the video in order to make the lesson more interactive. The platform that reports the answers of the learners to the teacher contributes to the evaluation process of the teacher. This content is assigned to the selected class. There are features of this platform specifically developed for flipped classroom model. One of the disadvantages of flipped classroom model is that the teacher cannot be sure whether the students watch the video or not. EdPuzzle can help teachers check whether the students watch the video. The software does not allow its users to skip the video while watching it. If a learner opens another tab during the video, it stops automatically. The video is not only watched on the prepared platform. The content can be integrated many other platforms. It does not always have to be the teacher who prepares the videos. Students may also be included in the video-making process. In this way, students' creativity will enhance and they will be integrated more to the lesson. Students can use the tools without any difficulty, since it is easy to use them. These features increase the prefer ability of the platform.

B.2. Edmodo

Today, many learning management systems are used by universities and institutions in order to make education activities more efficient. Edmodo may be considered as "social learning platform," rather than as learning management system. Because it's working the logic is similar to social networks' working logic. Edmodo can work with IOS and Android-based mobile applications.

Communication and cooperation dimension in the learning process are necessary for positive educational outcomes (Topping, 2005; Barkley, Cross, & Major, 2005). Of course teachers must use these dimension in the process of implementing the flipped classroom model. Edmodo has features that serve these dimensions. Thanks to a given group code students can be monitored by parents and teachers. Contents that prepared by students shared in a group setting. Intra-group messaging can enhance classroom interaction. <https://www.edmodo.com/>

B.3. Moodle

As can be understood from the concept of opening, Moodle (Modular Object Oriented Dynamic Learning Environment), is a flexible object-oriented dynamic learning environment (Moodle, 2010). Moodle can run on operating systems with support for PHP such as Windows, Mac, Linux. Moodle is free open source learning management system and can be used by students and administers easily. It is often preferred for these reasons. Because of iOS and Android-based Moodle mobile applications and feature to allow the quiz, it may be preferred by instructors.



B.4. BlackBoard

Blackboard is free if the institution has license. Otherwise it can be accessed for a fee. According to result of content analysis, blackboard is preferred by many trainers in the implementation process of the flipped Classroom model. This platform is functional via mobile support. Blackboard provides the storage, editing and sharing of learning content. Also, it is easy to use (Beatty & Ulasewicz, 2006). Via e-portfolio property it allows assessment of process and students. In addition, Blackboard makes the course interactive allowing for discussion and examination

B.5. Quizzes

Herried and Schiller (2013) indicated that students may come to school unprepared in implementation process. To solve this problem, quizzes can be put to work in flipped classroom model. In addition to the many benefits quizzes allow Just-in-Time learning (Novak, 1990). Brame (2013) stated that quizzes are required to identify areas where students need help. Clipchoos to, Smile, Quiz Slide, Testmoz, Socrativ to, Thatquiz, Classroom Marker, Gotoquiz, Quizst and Edmodo are some tool that can be preferred for this purpose. Teacher can prepare questions about the selected course content and they can define their answers. With these tools learners can challenge their peers on social networks. By this way lesson becomes fun and interactive. Students evaluate themselves while reinforcing their information.

DISCUSSION AND CONCLUSION

Time can be allocated for in-class problem solving, cooperation and activities supporting complete learning with the help of flipped classroom model. This pedagogic model enables learners to build their own knowledge (Bradford, Muntean & Pathak, 2014). Compared to other pedagogic models, there is more need to technology integration in the implementation process of this model. As a result of literature review, it has been found out that the activities used during the implementation of the model are not limited and many active learning activities can be included to this process. In this regard, the selection of tools will directly affect the efficiency of the model. There are various studies in the literature that state the effectiveness of digital technologies in the development of 21st century knowledge and skills (Fassbinder, Moreira, Cruz & Barbosa, 2014). It has also been stated in these flipped classroom model studies that peer interaction, question-answer method and the use of quizzes are necessary to be used. Some important difficulties and problems may be disclosed during the process prepared by integrating conceptual questions in peer-integrated learning (Mazur, 1997). The selection of these kind of interactive teaching methods can also eliminate the doubt in whether the learning will take place or not –one of the disadvantages of the model- to a great extent.

Tools that can be preferred in order to eliminate the limitations of the flipped classroom model have been presented in this study. The clues to which tool will be more useful in which stage of the model have been stated. The software programs and prepared contents chosen in this model should be accessible for teacher and students via various devices (Kharat, Josh, Badadhe, Jejurikar & Dharmadhikari, 2015). Content development operative in various platforms has been aimed by taking these into consideration in order to enhance the accessibility of the educational implications. In this regard, this study is aimed to serve as guidance for teacher who wants to use flipped classroom model in their lessons. In the studies reviewed, the necessity of the selection of tools such as quizzes and debates that enhance interaction has often been encountered. In this respect, using tools addressing many senses and integrating more students to the learning process are foreseen as more beneficial to the process instead of power point presentation.

The selection of tools that report the download and monitoring process of the learners in the implementation process of flipped classroom model will lead to the integration of learners into the process of knowledge acquisition. Furthermore, using social networks will contribute to the teacher-student and peer interaction in this process. Platforms that are integrated to social networks individualized and cooperative plays conditioning role in teaching and learning processes (Fassbinder *et al.*, 2014).

This study has presented the tools that make the knowledge acquisition process as a lower order skill productive and interactive. It is important to keep in mind that, these tools serve the purpose of the process of content preparation and presentation, and do not include in-classroom structural learning activities. If the



model's main purpose of sparing more time on in-classroom structural learning activities is considered, it can be stated that great amount of research is still needed for in-classroom processes. Since flipped classroom model is a relatively new pedagogic model, there is a need for further research. This study only investigated the software used in the previous studies, and hardware aspects were not taken into consideration. Further research can include the beneficial hardware that can be used in this model.

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