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An Innovative Learning Model in Digital Age: Flipped Classroom*

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Abstract

The study aimed to emphasize that digital revolution has crucial influences on the field of education as in many other fields. The relevant influences have led to radical changes in terms of teaching and learning approaches approved in the field of education. The students in our age have quite different characteristics when compared to the past, and their expectations have been shaped accordingly. Hence, it is quite difficult to draw interest and curiosity of the students today to learning activities through the traditional teaching approaches. Moreover, it is not easy to overcome some problems regarding teaching and learning by obsolete approaches. In this regard, the educators today show highly much interest in the innovative teaching approaches that address the needs of this age. One of those approaches is flipped classroom model. In this study, the conceptual and historical foundations of the flipped classroom model as being one of the popular instructional models in recent years, theoretical background of the model, and the advantages and disadvantages of the model in teaching processes were highlighted. Furthermore, interpretations concerning what kind of a role flipped classroom model would play to get over some problems in the field of education were included.

Keywords: flipped classroom model, blended learning, digital technologies

1. Introduction

Nowadays some parents and educators find the new generation's interest in computers, smart phones, tablet PCs and similar technologies, and how those technologies are used by this generation strange. They compare the current habits with the old, as well. In this regard, Prensky (2001) points out that the 'digital immigrants' who can not be flexible in their thoughts waste their precious time by grumbling that things were better before. He adds that on the contrary, those who can think in a flexible and perceptive manner attempt to comply with the digital world by getting help of the new generation while acknowledging that they are not informed enough about the unusual world of this generation.

It is possible to assert that one of the most leading reasons of the disparity in the ideas and experiences of the digital immigrants and digital natives is the modern digital revolution which influences our lives deeply, and the resultant new conditions. Digital revolution is acknowledged as one of the most noteworthy changes, which have a profound impression on humanity, following industrial revolution. That radical change reveals itself in a plenty of fields including particularly the pedagogy, sociology, psychology, economy and culture of societies. Drucker (1994) expresses that the most critical change in this process will be about information referring to the structure, content, meaning and importance of information. Correspondingly, the digital revolution restructures the education system of societies while transforming them, and eliminates several doctrines that are not disapproved (Toffler, 1996). This transformation leading to a radical change in the global learning systems (Prashar, 2015) reveals necessity of updating and questioning the teaching and learning environment designed, the roles of teachers and students, and the educational tools used (Kuhn, 2003).

It is necessary to make the educational activities efficient by preserving the gains from the past in accordance with the requirements of the age we live in. One of the possible ways to achieve this goal is reorganizing the teaching and learning environments. Then, how should the teaching and learning environments be? There is not only one answer to this question. Actually, it is already inconsequential to discuss a teaching and learning environment that is appropriate for all the learners because of the individual differences (Pritchard, 2015). However, it is possible to organize the teaching and learning

*This study was developed from the first author's PhD thesis at Gazi University, Graduate School of Educational Sciences, Department of Mathematics and Science Education.

environment that can be effective depending on the current context. We can organize those environments in a manner that can respond the needs of both learners and instructors, provide an environment for free thinking and that can offer solutions to the difficulties (Turhan, 2008). The point worthy of notice is the congruity between learning environments and the learners. Nowadays teachers are faced with 'Y and Z generations' that follow rather different learning ways when compared to the X generation. Then, the question 'should the digital natives learn through earlier methods?' or 'should the digital immigrants change the methods and approaches they adopt' has become a current issue. Unfortunately, no matter how much the immigrants may wish it, it is highly unlikely that the Digital Natives will go backwards (Prensky, 2001).

In this sense, the futurist educator Marc Prensky, who is also known as a critic of education, speaker, writer, advisor and a game designer, states that it will get increasingly difficult to educate the new generation through traditional methods, and that this will probably become impossible in the course of time. On the basis of Prensky's (2001) analyses, it is evident that digital immigrants and the methods they applied, and the teaching and learning environments they organized will be those necessary to transform. A well-known African proverb summarizes this: "When the music changes, so does the dance." The music has changed lately so it is required to change the musical instruments and the dance. In this regard, digital immigrant teachers have two options! One is to maintain instruction through less effective, traditional methods and will wait digital natives to substitute for themselves. The other is to acknowledge that they are immigrants in that digital world and to recognize the natives of the digital world by using multiple learning environments, flexible and creative thinking skills. Thus, they will preclude digital disintegration. In this sense, it is needed to keep in mind that serious determination is critical to realize innovative transformations that will ensure integration. Moreover, regarding that we live in an ever-changing world that is cruel and everlasting (Hargreaves, 2002), what is crucial is the awareness about the necessity of a remarkable individual effort and collaboration in order to ensure change and to catch innovations (Lunenburg & Ornstein, 2004). It is argued that the environments enriched through digital technologies take students' learning further and make them more prepared for future (Inan & Lowther, 2009). In addition, it is indicated that interactive use of digital technologies in a conscious and proper manner provides benefits not only to students but also to teachers (Cheung & Slavin, 2011).

In an attempt to enhance students' communication skills and attain information, a variety of technologies considered as the solution of some problems in education are acknowledged as a great tool that needs to be used in educational activities (Kirschner & Selinger, 2003; Salomon, 2002). From this point of view, technology is considered as a tool that promotes and facilitates learning (Alkan, Deryakulu, & Şimşek, 1995). However, some people have serious concerns about using the digital technologies in educational processes. Those concerns are related to the fact that digital technologies will undermine students' some skills particularly computational skills. However, those who have concerns should not forget that invention of cars, planes, jets, etc. either did not lead to forgetting how to walk or led to weakening that skill (Altun, 2014). On the contrary, those inventions have contributed to the progress of humankind a lot. Just as it is not possible to maintain the life keeping away from cars or other essential needs, a quality life disconnected to the digital technologies also cannot be sustained. In the simplest terms, let's think that how incompetent we feel all day when we forget to take our cell phones along in the morning. Similarly, digital technologies precisely have an unquestionable importance in improving the quality of educational activities.

2. The Conceptual and Historical Foundations of the "Flipped Classroom Model"

Educational content is shared, and teaching and learning processes are managed in two ways including face to face and online. Although performing educational activities in a face to face manner has become a routine for centuries, this picture started to change upon emerging distance education. The studies of distance education that have its origins in the 19th century evolved through the invention of radio, television and computers, and notable developments in this field took place. Especially the remarkable developments in the field of educational technologies have brought about a considerable rise in the importance of online learning after 1990s. All the same, although traditional approaches have some disadvantages, online learning approaches also lead to several disadvantages, which has brought up blended learning approaches. Blended learning is defined as the learning emerged from the combination of in-class face to face learning and online learning (Driscoll, 2002).

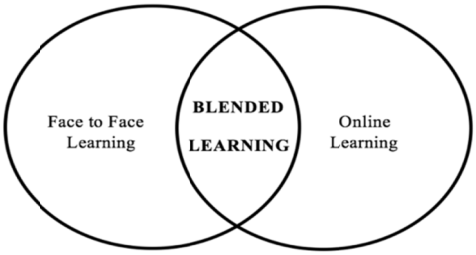

Figure 1. Blended Learning

Blended learning providing pedagogical means enhances social interaction opportunities, facilitates reaching information and saves time for active learning activities in class. This feature provides the opportunity of benefitting from both individual and group works in an effective way. This allows for synchronized activities in which teachers and students are involved in social interaction with each other in learning process. Thus, lots of visual and auditory documents provided in many environments contribute to richness in instruction, and alternative evaluation methods can be used so as to interpret and follow the educational activities and student progress. Moreover, it is a known fact that blended learning approaches raise the learners' responsibility in line with their individual learning performances (Staker & Horn, 2012). However, as Garrison and Kanuka (2004) particularly emphasize, blended learning approaches essentially intend to benefit from the advantages of both online and face to face learning; otherwise, it is hardly possible to ignore face to face learning, to phase teachers out and to perform just the online learning. On the contrary, both teachers and students are provided with active roles, and in-class activities are considered crucial in blended learning approaches. In the literature, a variety of blended learning models meeting on the common ground in question are introduced. In their study, Staker and Horn (2012) place flipped classroom model among the blended learning models as it is presented in the Figure 2.

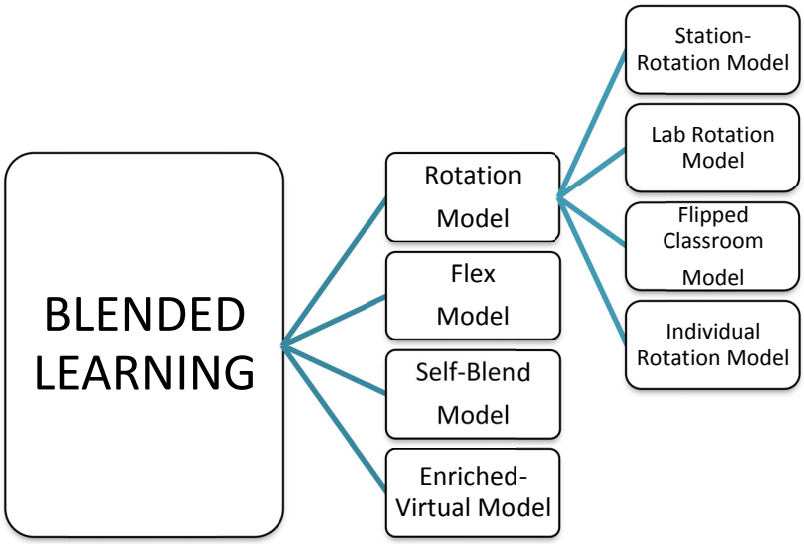

Figure 2. Flipped Classroom as a Blended Learning Model (Staker & Horn, 2012)

Flipped classroom model that is built on a strong foundation has been among the most popular blended learning models in recent years (Bergmann & Sams, 2012; Khan, 2011). Although its popularity has increased lately, the studies regarding practices of the flipped classroom model date back to 20-25 years ago. The flipped classroom model has progressed in line with the improvements/developments in technology since that time.

In this sense, lacking of digital technologies, the practices accomplished by Prof. Dr. Eric Mazur in 1990s who is a lecturer in the department of "Physics and Applied Physics" are the first examples of flipped classroom model (Missildine, Fountain, Summers, & Gosselin, 2013). In his book called "Peer Instruction: A User's Manual", Mazur (1997) puts emphasis on the idea that learning processes start out of school and go into more depth at school, underlining the importance of peer instruction. On the basis of this idea, Mazur asked his students to complete the lecture notes and the related readings in their books before coming to class. Afterwards, he formed small groups and created a discussion platform by including the students to the process over interesting questions about the important subjects of physics (Bruff, 2013). Similar to the studies by Mazur (1997), King (1993) also contributed to shaping the model and taking its final form though he did not exactly handle the flipped classroom model in its current form. King (1993) indicates that in the classes where flipped classroom model is implemented it is required to attach importance to active learning processes in which information and meaning is structured instead of relaying information.

In addition to all these contributions, Baker (2000), Lage and Platt (2000), and Lage, Platt, and Treglia (2000) contributed to the flipped classroom model remarkably, as well. In those studies that deal with flipped classroom model in the most similar sense to the one nowadays, the expressions "classroom flip" (Baker, 2000) and "inverted classroom" (Lage & Platt, 2000; Lage et al., 2000) were used as corresponding to the flipped classroom concept. The studies in question are among the earliest ones in which flipped classroom model was implemented in real terms. Baker (2000) proposes that lecturing should be accomplished out of class, and that cooperative group works should be conducted in classrooms in compliance with active learning. Thus, teachers find the opportunity to save time for meaningful learning activities that they can carry out with their students in class one to one and face to face. Baker (2000) thought of benefitting from electronic devices

actively in his lectures at the university, and he encouraged his students to prepare various notes and slides out of class. He expresses that rather than lecturing in class it is more meaningful to guide students in the studies they perform in collaboration with each other in groups. Besides, in the practices they carried out for the economy courses at the level of bachelor degree, Lage et al. (2000) focused on carrying out the in-class activities in the traditional and ordinary teaching out of class (via computers and various media tools) and carrying out the out-of-class activities in the traditional and ordinary teaching in class. They also put emphasis on learning styles in implementation processes.

It has been noticed that most of the studies focusing on flipped classroom model attempts to introduce the aforementioned model as the interchanged version of in-school and out of-school learning activities of traditional approaches. However, in traditional approaches, students generally keep away from active learning activities out of class. Furthermore, they usually do not make use of technology in classes. Hence, introducing flipped classroom model by attributing it to just the practices of traditional approaches (reversing) is not accepted.

Following Baker (2000) and Lage et al.'s (2000) contributions to the field, the studies in which flipped classroom model were implemented properly were carried out by Jonathan Bergmann and Aaron Sams. Bergmann and Sams working as a chemistry teacher at Woodland Park High School in Colorado State in the USA thought of what they could do for the students that could not attend the lectures due to the sports activities or any other reason not to fall behind in the class, and they decided to make videos for their lectures and to share those videos with their students in digital platforms. Afterwards, they opened to share some lecture notes and slides with the lecture videos on the Internet. That is how everything started, and the videos and documents shared online drew considerable interest. Because the students attending the classes asked to benefit from those documents, Bergmann and Sams (2012) started to study on a more systematic model by sharing their studies with all the students. At this stage, since all the students have got involved in this system, long lasting lectures have been replaced by a variety of activities including problem solving and modeling (Tucker, 2012). Bergmann and Sams (2012) determined several rules for their students to assume responsibility and to focus on their tasks in the learning process. Accordingly, they wanted their students to watch the videos definitely, to list the questions they were confused with while watching the videos and to come to school so. Bergmann and Sams (2012) noticed that this approach they adopted after experiencing to a certain extent allowed them to communicate with their students more effectively, manage a flexible learning process, give instant and effective feedback, and to back up their students more when required. The students' satisfaction with this situation and attitudes towards flipped learning played an active role in current state of the practices. In the course of time, those innovative flipped classroom practices became prominent at other schools, and upon heavy demands Bergmann and Sams (2012) started to give seminars and organized workshops at a variety of schools. In addition to the seminars and workshops they organized, they contributed to the literature a lot through six books they published including "Flip your classroom: Reach every student in every class every day-2012, Flipped learning: Gateway to student engagement-2014, Flipped learning for math instruction-2015, Flipped learning for science instruction-2015, Flipped learning for English instruction-2015, Flipped learning for social studies-2015".

Following Bergmann and Sams, the flipped classroom practices were carried out by Karl Fisch who is also a math teacher in Colorado. Fisch wanted to digress from the educational practices he continued to carry out for a long time, and he shared the videos of his lessons on "YouTube". On the other hand, he mainly conducted problem solving activities in his lessons. Pink (2010) mentions Karl Fisch's practice as 'Fisch Flip'.

At this point, what made the flipped classroom model well known is the Salman Khan's speech titled as 'Let's use to reinvent education' on TED (Technology, Entertainment, Design). Within this speech that was clicked over four million times on digital platforms, Salman Khan used the expression 'flipping the classroom/flipped classroom', and thus, flipped classroom model was recognized in the international arena. At this point, as it was indicated in the "The NMC Horizon Report: 2015 Higher Education Edition", it is expected that the flipped classroom model will spread rapidly.

3. Theoretical Background of Flipped Classroom

Flipped classroom can be defined as: "A blended learning model in which meaningful and active learning activities involving metacognitive activities are carried out as part of cooperative and individual work in classroom settings, and in which low cognitive level activities and independent studies in accordance with the individual's learning speed are carried out outside of school settings through utilization of class videos, slides, articles and course notes in digital platforms". Thus, flipped classroom model applications have two significant phases. These are: first out of the class - independent studies carried out online platforms and second in class - inquiry-based activities. In this sense, out of class activities prepare a foundation for in class activities.

Cognitive tasks play a critical role in learning within the framework of flipped classroom model practices and applications. To this account, referring Blooms most recent cognitive domain taxonomy is beneficial to have an insight about the flipped classroom model practices. In general, low level cognitive tasks (remember, understanding) are performed as out-of-class flipped classroom practices while higher-level (application, analysis, evaluation, creation)

cognitive activities are performed in classroom settings (Brame, 2013). Hence, the flipped classroom activities starting out of class and proceeding in class are performed in compliance with the revised levels of Blooms' taxonomy of cognitive domain levels. The place of in-class and out-of-class flipped classroom applications among Bloom's revised cognitive domain levels is shown in Figure 3.

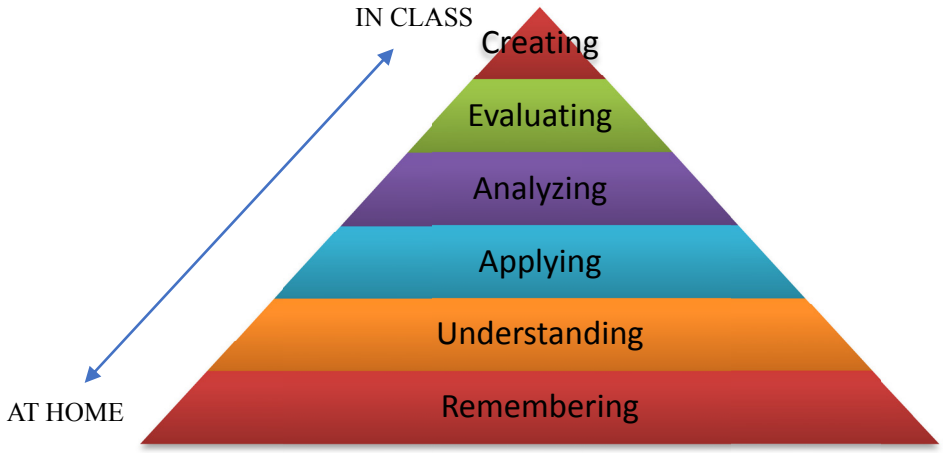

Figure 3. Bloom Taxonomy and Flipped Classroom Model

Within the scope of flipped classroom practices, students primarily work independently outside of the school setting through utilizing digital media and platforms. Thus, they acquire basic level of knowledge before entering the class and take the learning responsibility. They can establish strong social interactions by getting instant contact with their teachers and peers through use of digital media tools once again. At this stage, student shares the questions with others that s/he struggles, cannot overcome with personal effort, and does not understand. This development shows the need for teaching support that is also referred as scaffold. Hence, one can deduce that the student in the zone of proximal development and needs appropriate support as scaffolds. Also, appropriate support should be provided to the student in this zone.

The learning and development process of the students continues intensely within the classroom. Students are able to interact with their peers and teachers and deepen this social interaction that they initiated. Moreover, they are involved in active learning activities in the context of real life through engaging in the cooperative group works carried out in the class. In this sense, they learn how to share the learning responsibility. The implementation stage of in class activities requires higher order level of thinking abilities; students frequently need support in the process of task engagement. The specifics of the students' support needs can be deduced from their conversations and performance. In this sense, it is expected that conceptual understanding and the progression will be realized at the end of the class period that encompasses intensive and fun activities requiring higher order cognitive skills. In this sense, flipped classroom model provides a flexible and inquisitive learning environment in accordance with differentiated learning, enables interactive and collaborative and cooperative work, includes active and meaningful learning activities, supports structuring of knowledge and meaning in a discussion-rich environment and provides opportunities for the student to progress in the zone of proximal development. Along with this, during the flipped classroom practices, responsibilities related to learning objectives are shared and experience is gained through social interaction. These processes also provide teachers with the opportunity to give more effective guidance and support as scaffold practices. Thus, the structure of the flipped classroom practices also meets the doctrines of the constructivist theories (Brandt, 1997; Davis, 2013).

Various theoretical frameworks have been proposed for flipped classroom model in the literature. One of those frameworks was proposed by Strayer (2007) demonstrated in Figure 4. This framework points out that activity based learning is performed by use of educational technologies in flipped classroom model; thus, learning environments are affected by this process.

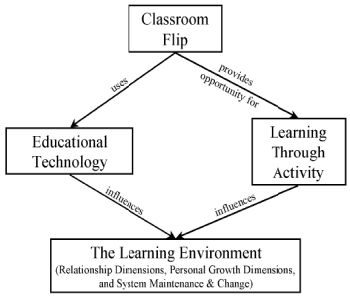

Figure 4. Theoretical framework of flipped classroom model (Strayer, 2007)

Taylor and Statler (2014) indicated that there is a relation between student engagement and learning. Through Flipped Classroom Activities, students are able to participate actively in problem-solving processes and evaluate their own learning, interact more with each other, cooperate and identify their learning gaps, develop their critical thinking skills through frequent discussion activities, and to start creating more connections between existing knowledge and new knowledge. Therefore, as it can be clearly seen in Figure 5 flipped classroom model increases the level of participation of students significantly and thus it is possible to realize active and meaningful learning.

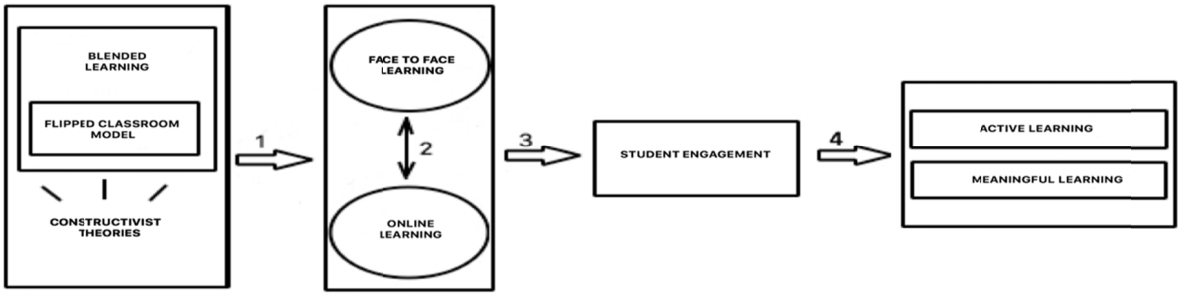

Figure 5. Theoretical Framework for flipped classroom model (adapted from Reeve, 2013)

In Figure 5, four basic points are emphasized and the theoretical framework of flipped classroom model is explained item by item as follows.

1. Flipped classroom model, is a type of blended learning and supported by constructivist theories, includes both online and face to face learning.

2. Instruction is carried out of the school setting through uploading videos into online platforms. In this respect, more time is gained to implement more effective teaching in the class. In other words, online learning offers opportunities to increase the quality of face-to-face learning.

3. In flipped classroom model practices both online and face-to-face learning environments are utilized and a rich learning environment is created. Thus, the level of student engagement increases.

4. Flipped classroom model develops 21st century skills, lifts the boundaries of the class, and ensures that learning activities are assessed in real life context. This results in active and meaningful learning.

4. Some Advantages of Flipped Classroom Model in Educational Processes

Flipped classroom model provides a variety of advantages for both teachers and students with its enriched learning environments both inside and outside of the school. The advantages of flipped classroom model are presented in depth one by one in the following paragraphs.

Flipped classroom model practices give learners the opportunity to learn in accordance with their individual speed and performance (Bergmann & Sams, 2012). Students benefit from the educational videos, lecture notes, slides etc. shared in digital platforms outside of the school. They can repeatedly watch the videos through make use of stop and play feature of the videos or they can reach and study the written and visual materials at any time they want. Therefore, students can easily benefit from digital technologies and written or visual documents besides their teachers' support (Fulton, 2012a).

Smith (2013) particularly emphasizes that the course videos are an important part of the flipped classroom model and shares his study findings that 97% of the participant students find the course videos useful. Herreid and Schiller (2013) also indicates course videos play important role in students' behavior, performance and attitudes. However, it is recommended that these videos be kept short (approximately10 minutes) in order to be effective (Alvarez, 2012; Forsey, Low, & Glance, 2013; See & Conry, 2014).

Next, students are no longer alone outside school by means of flipped classroom model. This is because students communicate with their classmates and teachers using digital applications at any time they want and they get sufficient and effective feedback (Hamdan et al., 2013). In this respect, flipped classroom model practices contribute to the establishment of a healthy communication network between teachers and students (Cockrum, 2014; Lage et al., 2000). The healthy communication that is established in this process also brings an active interaction process. Teachers have already indicated that the most effective part of flipped classroom model practices is based on establishing individual interaction with students throughout the whole course (Moore, Gillett, & Steele, 2014; Smith, 2013). Therefore, flipped classroom model that increases teacher-student and student-student interaction both in and out of the class (Driscoll, 2012) also enables teachers and students to use their time effectively (Johnson, 2013). In addition, there is an opportunity to prevent misconceptions by means of instant communication and versatile interaction (Berrett, 2012).

Flipped classroom model enables active participation of students in the class since it is interesting in addition to providing ways of communication and richness of interaction in learning processes. It can be also considered that lesson videos also have an effect on this participation. In fact, it can be said that, outside of the classroom digital technologies, inside of the classroom interactive activities are effective in students' in class participation and their ability to focus on the specified task (Bergmann & Sams, 2012; Lage et al., 2000; Riendeau, 2012; Smith, 2013; Tucker, 2012). Herreid and Schiller (2013) indicate that with flipped classroom model practices, students are encouraged to think about their own learning processes both in and outside of the classroom and engage their own learning process.

The participation of students in the classes is reinforced by the cooperative learning activities of flipped classroom model. Flipped classroom model develops cooperative learning skills that are placed among the 21st century skills (Abeysekera & Dawson, 2015; Bergmann & Sams, 2012; Hamdan et al., 2013; Strayer, 2012; Tucker, 2012). Thus, through sharing their responsibilities, students gain the habit of working together and have the opportunity to benefit from their peers in their learning process (Gojak, 2012). In this way, they become aware of different perspectives and see different problem solving strategies (Bland, 2006). Thus, flipped classroom model practices have contributed to student both in academic and motivational senses (Davies, Dean, & Ball, 2013; Gannod, Burge, & Helmick, 2008). Therefore, students' anxiety levels can be controlled (Marlowe, 2012; Strauss, 2013).

With all these gains, flipped classroom model contributes to an increase in students' academic achievement and performance (Alvarez, 2012; Forsey et al., 2013; Fulton, 2012b; Hamdan et al., 2013; Riendeau, 2012). flipped classroom model practices are very crucial in terms of including metacognitive activities that increase students' performance and academic achievement since students internalize concepts, gain critical thinking skills, and monitor their developments in terms of learning outcomes through flipped classroom model applications (Berrett, 2012; Gojak, 2012). Therefore, students become responsible for both individual and collective learning processes within the framework of flipped classroom model applications (Baker, 2000, Bergmann & Sams, 2012; Hamdan et al., 2013).

Teachers, just as students, play an active role in flipped classroom model applications and actively provide support and guidance to their students. They also have to renovate themselves by sharing students' learning responsibilities. In this respect, flipped classroom model also contributes positively teachers' professional developments (Alvarez, 2012).

Another advantage of flipped classroom model compared to other models is more time can be allocated for the learning activities based on constructivist theories in the classroom. Now students are starting to learn outside of the school and come to class with a certain knowledge. Hence, there is more time left in the classroom for inquiry-based activities. This is (unable to allocate time for constructivist activities in the class) one of the most complaints of our teachers. Flipped classroom model offers important opportunities for teachers and students in this regard.

In addition to all these academic and social contributions, flipped classroom model also provides administrative advantages. Cockrum (2014) mentions that a considerable part of the academic learning time is allocated for disciplinary problems. Flipped classroom model as an innovative teaching approach reduces the disciplinary problems (Cockrum, 2014) and lesson absenteeism (Alvarez, 2012).

When evaluated in a comprehensive way, flipped classroom model associates real-life applications with teaching processes, offers significant contributions to lifelong learning and brings a different breath to the education with the innovations it brings.

5. Challenges Confronted in Flipped Classroom Practices and Suggestions for Solutions

Besides the discussed benefits of flipped classroom model in education process, it also encompasses a number of challenges within its structure. Of those challenges, preparing lesson videos, and visual and written materials is the most prominent one since it is a hard and time-consuming task (Davies et al., 2013; Gannod et al., 2008; Hamdan et al., 2013; Herreid & Schiller, 2013). Bergmann and Sams (2012) state that readily available instructional resources can be utilized and this will not take too much time. However, even if each teacher wants to prepare their own lesson video and other course content, this difficulty will be a challenge for the first year since the videos and other documents prepared before can be used easily in the next years along with necessary refinements and revisions based on current updates in the field. Thus, through collaboration with other teachers, teacher can carry out shared works or utilizing readily available resources, teachers can overcome this challenge.

Strayer (2009) states that in the process of applying flipped classroom model, students may feel anxious about monitoring the course videos and completing the readings before coming to class. This should not be perceived as a disadvantage since anxiety up to a certain limit is beneficial for learning. In other cases where flipped classroom model is not applied, completing the tasks such as homework, exercises will remain as an issue that can also trigger the anxiety.

Bland (2006) indicates that students may experience difficulty in meeting the new responsibilities and expectations that are required by flipped classroom model applications, and that they may experience adaptation problems because of the

new approach. In these situations, a gradual transition to flipped classroom model applications, sharing responsibilities in an entertaining way, sharing expectations and tasks clearly, and using the rewards system may facilitate this transition.

Considering the situation of students who do not have access to Internet technologies from a technical and economical perspective is appeared to be a challenge to deal with in flipped classroom model applications. Yet, the applications that are used in flipped classroom model practices are compatible with many devices such as computers, tablet PCs, smart phones, etc. narrow the problem as almost everyone has a smartphone including children nowadays. Nevertheless, the group of students working together should be checked to see if they have the necessary technical infrastructure for flipped classroom model applications.

Finally, in the scope of flipped classroom model applications, some challenges can be encountered. These challenges are as follows: "Students want to prefer traditional approaches since they are familiar these approaches and feel 'comfortable' because of their passive role in the learning process (Missildine et al., 2013; Strayer, 2009), teachers and students view constructivist approaches as a waste of time, (Mangan, 2013) and they approach innovative approaches in a prejudiced manner."

It can be said that these challenges are more demanding than the others mentioned before because overcoming those difficulties requires a radical paradigm change. This is not an easy task to achieve. However, this difficulty is not just unique for flipped classroom model, actually these sorts of problems can be faced in all innovative approaches. Even though it is a difficult task to overcome these problems, it is possible minimize the anxieties and concerns of the parties and minimize the disadvantages by focusing on the benefits provided by flipped classroom model.

Some of the difficulties that can be encountered in the flipped classroom model framework can also depend on some misconceptions about the flipped classroom model. Some of the misconceptions about the flipped classroom model are listed below:

- The course videos take the place of the teacher and the videos represent the teacher's activities in the class settings.
- Flipped classroom model is confused with distance learning and is regarded as equivalent of distance learning.
- Students work in an unplanned way.
- Students and teachers spend all their time in front of a computer screen.
- Students are left alone in the learning process, isolated from society.
- Students need to have advance level of knowledge about information technology.

Depending on how it is perceived and implemented, the advantages or disadvantages of the flipped classroom model in the learning process may vary from macro level to micro level based on a number of factors including country, culture, the subject matter or the classroom where it is applied. From this point of view, investigating the applicability of the flipped classroom model in different countries' educational settings, benefits of the flipped classroom model in the learning processes, the challenges and solutions that can be experienced in the application process will make a significant contribution to the field.

6. Discussion

The New Media Consortium (NMC) published 'The NMC Horizon Report: 2015 Higher Education Edition' (Johnson, Adams Becker, Estrada, & Freeman, 2015), in which flipped classroom model is mentioned as one of the six learning technology trends which will impact the future in a great extent. Also, the report indicated that flipped classroom model would spread dramatically within one year. The increase in the number of educators implementing flipped classroom model in their classes and institutions and increasing number of academic research on this particular area within last two years is also supported this anticipation. It is encouraging that digital technologies, including web 2.0, 3.0 and 4.0 technologies that support flipped classroom model applications, are increasingly becoming one of the most common educational trends (Welsh, Wanberg, Brown, & Simmering, 2003) in the learning and teaching process.

Flipped classroom model, which has a high propagation rate, presents considerable advantages for both students and teachers in terms of its suitability for individual learning speed and performance (Bergmann & Sams, 2012), prompting learning curiosity and eagerness (Foust, 2012), providing opportunities students and teachers with instant interaction within and out of school settings (Cockrum, 2014; Hamdan et al., 2013; Moore et al., 2014), providing opportunity for effective and efficient use of learning time (Johnson, 2013), developing cooperative learning skills (Abeysekera & Dawson, 2015, Bergmann & Sams, 2012, Hamdan et al., 2013; Strayer, 2012; Tucker, 2012), encouraging peer support in the learning process (Gojak, 2012), contributing to conceptual understanding through fostering critical thinking skills (Berrett, 2012; Gojak, 2012), ensuring learning responsibility (Baker, 2000; Bergmann & Sams, 2012; Hamdan et al., 2013), contributing positively to the professional development (Alvarez, 2012), decreasing disciplinary problems

(Cockrum, 2014) and lesson absenteeism (Alvarez, 2012), and of preparing for lifelong learning (Bland, 2006). As a result, flipped classroom model has provided both academic and motivational contributions to students and teachers (Davies et al., 2013; Fulton, 2012b; Gannod et al., 2008). All these gains are important indicators for that flipped classroom model responds to the requirements of our time.

Today, the problems about the rote-learning based and competitive central education system, the way the curricula are implemented, lack of analytical thinking, interpretation skills and socialization, and technology integration into education are frequently discussed, and those problems prevent development of 21st century skills.

The problem of finishing curriculum materials within the framed time and the concern aroused as a result this curriculum pressure, may cause teachers to stay away from constructivist approaches and inquiry based learning methods. In this regard, flipped classroom model helps teachers to overcome this time pressure problem and support them to gain more time by providing alternative ways with the principle of acquiring the theoretical knowledge out of school. In addition, suggesting alternative ways results in lifting the boundaries of the school that allows students to develop their social and academic growth in a wider and enrich environment. Thus, an enriched learning environment is created and a critical point of view can be developed. Also, teacher can closely monitor the progress of the students in and out of school settings and support their construction of learning process in flipped classroom model. The support (scaffolding) strategies provided by the teachers influence the students' individual performance and group work, help their understanding and are highly effective in teaching higher level cognitive strategies (Pritchard, 2015; Rosenshine & Meister, 1992). As a result of these instructional scaffolds, productivity and effectiveness in the teaching process have also increased (Jacobs, 2001). In this respect, it is noteworthy that flipped classroom model allows students to receive support from their peers and teachers both in school and especially outside of the school.

Another issue that needs to be emphasized is the innovation that flipped classroom model brings to technology integration into education. In some teaching models, technology is only used either in school or out of the school. This limitation has been lifted with flipped classroom model and digital integrity has realized. The problems encountered in the process of technology integration into education in many countries are one of the triggering factors to implement flipped classroom model. The need for the realization of this transformation can be examined through the Fatih Project case implemented in Turkey (see for Fatih Project: Çevikbaş & Çevikbaş, 2015). Even though, huge objectives have been settled in the Fatih project route and a serious budget has been allocated, one can see that the project has encountered some setbacks along the way. Especially, it is stated that the teachers and students cannot benefit effectively from digital technologies (interactive board, tablet PC, etc.) provided within the scope of the project and this shows that the project is located far away from their determined objectives (Çevikbaş & Çevikbaş, 2015). EBA, a sub-project of the Fatih Project, has not succeeded in being a platform with its rich content, where teachers and students interact with each other. It is also thought that the source of these problems is related to the teaching approaches adopted. Therefore, the implementation of flipped classroom model applications are seen as an opportunity to ensure technology integration into education, especially along with the effective implementation of the Fatih Project. In this respect, it can be considered that it is beneficial that the education policymakers profound a strong strategy related to flipped classroom model applications and support these applications.

It is of course worthwhile to focus on the problems mentioned above in the learning and teaching processes and to make some designations in these matters, but it is not possible to generate a solution only by identifying the problems or discussing these problems. Therefore, it is also necessary to consider the solution of these problems in the field of education. In this regard, flipped classroom model is an important model that needs to be considered.

As a result, flipped classroom model has remarkable yields for all stakeholders involved in education and training processes, especially teachers and students. When the importance of flipped classroom model and the limited number of researches that focus on flipped classroom model are considered (Hamdan et al., 2013), it is necessary to examine and develop this modern learning model in different contexts.

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