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# The Prediction of the Use of Flip Classes with FATİH Project

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***Abstract*** - Flip classes, teaching with the increasing use of technology in education has emerged as a new pedagogical methods for providing effective teaching at a time when the increased public courses. Flip classes offer asynchronous video lessons, assignments, discussions, activities, problem solving and learning activities occure at classroom but offers to learn basic course topics at home. Flip classes has left behavioral learning environment to a constructivist environment. This study conducted a detailed investigation of the flip classroom and applicability of flip classroom in ongoing Fatih (Fırsatları Arttırma ve Teknolojiyi İyileştirme Hareketi- Movement of Enhancing Opportunities and Improving Technology) Project. In this context, the course planning and research activities, the use of appropriate tools, the concept of flip class, theoretical framework, content, course preparation and subjects were examined. For this purpose, an extensive literature review was done especially through accessed international resources.

*Keywords:* flip classes, fatih project, video learning, technological classes

## Introduction

Technology has affected the field of education more than any other field has affected, and the intensive use of technology in education has begun to remove many past obstacles and has increased the use of educational tools, especially at low cost (Stallman and Lessig, 2010). Now the encyclopaedics have been removed from the shelves and moved to the electronic systems. Technologically, video courses have exploded in personal learning, and it turns out that teachers are more effective in flip classes than face-to-face classes (VanLehn, 2011). In the flip classes, lecture videos are given to students like homework for watching at home and left to interactive learning activitiesin classroom sessions. This lies at the basis of the flip classes.

Recent developments have students access the lecture and resources outside the classroom. Scholars have reported some studies prevents stakeholders from having a clear view of the benefits and challenges of flip classrooms. Major articles were analyzed and the results showed the direction of flipped Classroom. Suggestions include describing in-detail the flipped approach; performing controlled experiments; and triangulating data from diverse sources (Giannakos et al. 2014).

Grazia, Janet, and John (2012) declared that students are more prepared to classrom activities by watching video instead of reading preparation. Short videos should be preferred. Moravec, Williams, Aguilar-Roca , and O'Dowd founded in the biology lesson that fulfill the necessary preconditions before class session increased performance by 21% at the end of 10 minutes of mini-lessons and 5-7 minutes of active participation activities. Day and Foley (2006) compared the traditional teaching class with the flip class, and saw those in the flip class acquired more grades.

Gencer, Gürbulak and Adıgüzel (2014) have introduced in detail the flip class system in terms of technique and application and have investigated the situations in which classroom use can be influenced by learning-teaching culture in Turkish education system. It was seen that the effectiveness of the Flip-class system at various levels of education have positive effect on the system. This study predits the use of Fatin Project infrasructure will support students' studies at home in flip classroom context.

## Theoretical Framework

Jonathan Bergmann and Aaron Sams, chemistry teachers at Woodland Park High School, Colorado proposed a solution for the students who missed the course. They recorded their courses and publish them online. Thus an opportunity was made and the students showed their interest in the course materials. But also online learning materials were given to students. It was noticed that students were interested in repeating the lesson. Bergmann and Sams made a radical and instead of wasting time by explaining the subjects in the classroom; they discuss and solved exercises (Tucker, 2012).Recently, contrary in the World, an increase about flip classes studies in Turkey is observed. Studies have shown that reversed learning students' academic achievements (Aydin, 2016; Farah, 2014; İyitoglu, 2018; Johnsonand Renner, 2012; Öztürk, 2018; Yestrebsky, 2015), motivation (Alsancak Sırakaya, 2015; Aydın, 2016; Iyitoglu, 2018; Turan, 2015) and attitudes towards the course (Bell, 2015; Ceylaner2016; İyitoglu, 2018) has a positive effect on student success.

The term "flipped", which is defined in a basic sense, refers to the redefinition of teaching environments. When flip classes are mentioned, they are handled in a wide range and in reality curriculum development and activities are included. It is necessary to define the inverted classes as a two-part educational technique: interactive group learning activities in the classroom and computer-based instruction outside the classroom. This broad perspective is illustrated in Figüre 1 (Lihocit and Larrington, 2013). Lage, Platt, and Treglia (2000) have clarified the definition of "flipped (or inverted)" in the form of replacing traditionally performed classroom activities and extracurricular activities. This situation is shown in Table 1.

Table 1
*Basic definition of flip classes*

| Method | In class | Out of class |
|---|---|---|
| Traditional lecture | Traditional lecture exercises and problem solving | Exercises and problem solving |
| Flip classrooms | Flip exercise and problem solving video lessons | Video lessons |

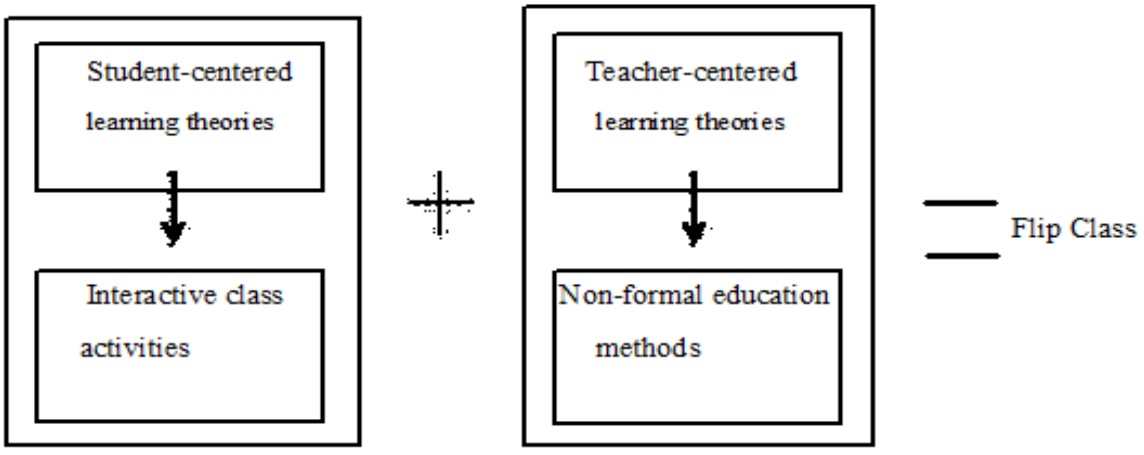


Figure 1. Perspective of flip classes

The theoretical basis for the flip classes comes from the theories of Piaget 1967 and Vygoysky 1978. Tudge and Winterhoff (1993) reported similarities and differences between these two theories. Foot and Howee (1998) stated that these theories provide a background for individual learning. These theoreticians have stated that constructivism is stemed from Piaget's theory of shared learning and Vygotsky's contiguous domain theory in collaboration. Topping and Ehly (1998) reported that an individual-supported learneing theory is a part of learning theories.

In Keller's (1968) "Good Bye Teacher" – an individualized learning system- the supervisors give directions to the students, the course and performance targets are clearly specified and the motivation of the students is increased. The modules used included reading material, assignments, films, audio materials, travel notes, scheduled instructional materials, exercises and interviews. The evaluation is for performance purposes, and certain incentives have been given to those who complete the assessment at their own pace and within a certain period of time. These discussions have initiated the use of classical classes by Keller in a modern approach to classical education. In this context, Keller (1968) noted that this method is clearly distinguished from traditional teaching methods as follows:

- The ability to progress for individual steps
- Ability to complete the unit for progress
- Use of lessons and presentations as a motivational tool
- Importance of associated with written words in student-teacher communication
- The supervisor concept that allows repeated tests.

Constructivist theory is considered to be the source of problem-based learning and active learning. Kolb's learning styles are based on Piaget's theory. Explanations of these theories and learning styles are given for a better understanding of the flip classes. Learning style theories indicate that each individual develops educational outputs by matching their experience with specific learning styles that are unique to them. Here Kolb's experiential learning theory which predicts perception and processing in terms of flip classes (Kolb, 1984).

According to Kolb, new knowledge, skills or attitudes can be achieved by having four forms of experiential learning. Students have four different skills to be effective. These; concrete skills of life, reflective observing skills, abstract skills and active life skills. In other words, they should be able to create concepts that can logically incorporate their observations into logical theories (abstraction skills), problem solving and decision making (reflection skills), ability to observe and reflect on their experiences in many ways (reflective observing skills) they should use these theories (Ulusal Eğitim Mecmuası, 2003). For knowledge acquisition Hmelo- Silver (2004) define assistive learning as support and active help for the acquisition of knowledge and skills in a parity or matched situation. In this situation collaborative learning consists of collecting work together to reach common goals and collecting individual aids in order to achieve the goal (Foot and Howe, 1998).

Problem-based learning, on the other hand, is applied to achieve more flexible knowledge, effective problem solving skills, personally guided skills, effective collaborative skills, and intrinsic motivation goals (Hmelo-Silver, 2004). Problem-based learning has following characteistics (Barrows, 1996):

- Student centered.
- Learning occurs in small groups.
- Teachers are facilitators and guides.

- The focus is on stimulating interest in problems.
- Knowledge formed by individual directed learning.

When we look at student-centered active learning and problem-based learning theories, they are important for flip classes. There is no flip class without them. Some argue that computer and video courses constitute flip classes, but this is a big mistake because flip class theories are used in the design of classroom experiences and studies and are the most important factors of success (Accreditation Board for Engineering and Technology, 2009).

For understanding flip classes it is also necessary to look at the theory of Benjamin Bloom. Bloom's taxonomy divides learning activities into six hierarchical categories. These sequential categories are based on knowledge acquisition, reasoning, application, analysis, synthesis and evaluation. In traditional classes, the application is shown as follows (Lihosit and Larrington, 2013).

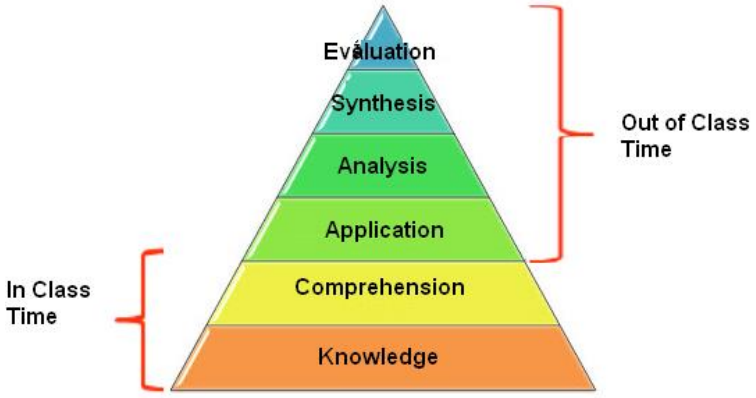


Figure 2. Taxonomy of Bloom in flip classes

In Figure 2 the application of the flip classes, the process of acquiring and understanding the information in the Bloom taxonomy is shown in video classes and can be done outside the classroom. Students are involved in the application, analysis, synthesis and evaluation processes under the direction and supervision of the teacher in the class at a higher level. Students use their critical thinking skills by doing exercises and apply what they learn at home videos. Thus, students have more time to cognitive learning in the classroom than in the upper levels of Bloom's taxonomy (Garland, 2012).

## Flip Class Course Preparation

When teachers plan lessons for the flip classes, they usually focus on the activities to be done in class and the preparations of the students for the lessons. However, it is also important in flip classes how to implement the activities and to obtain the necessary precautions in class.

### Classroom Preparation

For the exercises to be carried out in the class, the points where the students will spend time and the points to be challenged are estimated and the time adjustment should be done. The materials should be arranged according to the degree of difficulty in this respect. Unless students are asked for a question, the teacher should introduce the subject and make involve the students to the lesson. The teacher should ask questions like following instead of asking passive questions like "How are you going?":

- What have you done so far?
- What tools did you use?
- Are you pleased with the results?
- Where were you blocked?
- Did you change your method after you started?
- Is there a way to follow a different path?
- Have you been disappointed? (Lihosit and Larrington, 2013).

It is important to always think about how to make practice, discussion and practice more effective. The following points should be considered for this (Center for Teaching Excellence, 2013).

Introducing Subject: The aim is to make the preparation and participation of the students to the highest level before class. The teacher should state expectations about what the student should do. It should also tell students what to do. How to deal with active learning should be explained and no surprises should be left (Center for Teaching Excellence, 2013).

Out-of-class topics: It is important to be careful in choosing media for online activities and course materials, use teacher presentations, screen recordings, web pages, text-based materials (pdf, word), videos and audio materials. Video content must be carefully selected and processed and presented in 10-15 minute fractions. It is important that the presentation narration / questions and the subjects related to the targets are handled at the presentation. If the students are allowed to ask questions from the home, the answers of the questions should be discussed in class.

Evaluating learning: Prior to classroom work and activities, the student should be adequately prepared for the course. Personal assessment quizzes and online exams are useful to show the level of preparation. In general, the preparation and assessment exams should be short and should consist of 3-4 questions, the questions should be aimed to measure the end of the lesson and measure what is in preparation. Process feedback and student inquiries should be allowed. A brief assessment of the class can be done at the beginning of the lesson. Learning and evaluation should be intertwined that low outcome and process evaluation should be valuable learning tools for students.

Classroom activities: Increasing learning and teacher student dialogues enhance collaborative learning, on demand learning and other types of active learning. The objectives of the activity should be related to the course objectives and evaluations. Students' time in the classroom should be guided to creativity.

Motivation: Student motivation plays an important role not only in learning but also in activity design and usage. A positive atmosphere should be established in the class and a clarity policy should be applied. Meaningful and practicable activities should be performed. Students should be made aware of the significance and future availability of activities (Center for Teaching Excellence, 2013).

Keeping the curriculum workable: In order to run a fliped classroom followings are important:

- Beginning from the beginning: Start with a topic or module. A subject or module course that can not be converted to a fliped class format can be manipulated by traditional methods.
- Getting help from a familiar person: A flip classroom application can make it possible for someone familiar to work to be a partner. In this way, ideas and help are provided in places that are clogged.
- Reasonable timing: Video and non-class materials should be kept up-to-date.

## Basic building blocks

The material and possibilities for the courses should be reviewed and regulated. Lessons, examinations, lesson plans, lecture notes and subject exercises are important. Some of these can be used and some of them can be renewed and put in the desired form.

*Course description*

Lessons for the classes of the flip classes include all the goals and plans of the lesson. The teacher informs the students about the attendance, compensation and grading policies, the expectations about them and the philosophy of education. Videos should be added to the course for preparation. The videos take the place of the subject narration and can be exercised and discussed more (Lihosit and Larrington, 2013). For flip classes, the course should start by seeing the big picture and make the necessary changes as in Table 2.

Table 2
*Comparative study of courses*

| Criterion | Traditional | Flip class |
|---|---|---|
| Pre-course homework | Reading | Video |
| During the lesson | Lecture, demonstration | Group exercise, discussion |
| Homework | Exercises | Improvement activities |

*Lesson plan and objectives*

Topics should be more specific in the lesson plan. Highly interactive learning for active learning should be done in the class. The principles in Table 3 can be taken into account when planning lessons.

Table 3
*Flip class course planning principles*

| Traditional | Time | Flip class | Time |
|---|---|---|---|
| Discussion, question and answer | 5 min | Discussion, question and answer (about videos) | 10 min |
| Lecture, demonstration | 40 min | Team work | 40 min |
| Break | 10 min | Break | 10 min |
| Starting on homework assignments | 20 min | Discussion on exercises and activities | 15min |

The students should be prepared according to the previously announced videos. It is not necessary to prepare a video course for each topic. Students should not use unrelated materials and they should be excluded from the course content (Lihosit and Larrington, 2013).

*Content*

In general, most courses should include these three types of content. Content should be relevant to the topic and should support active participation. In a flip class content should be reduced to three main category (Lihosit and Larrington, 2013). These are;

- Giving information,
- Presentation of the task,
- Opportunity to show the student the skills.

Some course materials require demonstration technique and can be given together. These tools can be navigational facilities and screen displays. In the flip classes, the basic course subject expression content can be given out of the class. This content should be linked to applications. If necessary, informing and demonstration content can be combined to make take-home students works. The most important issue is the content in practice. The important thing is to create an effective application and exercise mechanism. On this view, students reach high-level learning by doing exercises (Lihosit and Larrington, 2013).

*Technology Selection*

There are many tools for converting lessons to video. Some are free and some are open source. Screen recording software is especially necessary. In addition, some of these programs integrate with the web camera to record the image of the speaker. Captivate and Camtasia are commercially available. Jing and Screenr are free. Those who are paid also record class discussions. Open source software is sufficient at the basic level.

The programs to be selected should be easy to use, to learn, to respond appropriately and to be cost-effective. It should also be noted that the recording formats of the programs used and the browsers / software that will run them should be compatible (Lihosit and Larrington, 2013).

**Significant Issues and Potential Problems in Flip Classrooms**

According to Tarhan (2013), in order for the flip class system to function properly developing their competence, in particular the skills to use technology; digital development, social media, new sources, tools and methods; teaching them rather than to do it; providing healthy, and developing feedback, not intervention. In short, flip classes; will be accomplished by actively entering into, engaging in, seeing, experimenting, and working together, rather than being passive. While education-based technology and online platforms continue to grow and develop, the Flip class system has the advantages for students and teachers stated as follows (Duerden, 2013):

- Students will be able to learn different times according to their skills
- Student's ability to comment
- To enable the student to learn in advance the information that will be used in activities
- Providing information to the student who is sick or not, at any time
- Providing families with the opportunity to follow lessons and help their children more
- Students to take responsibility for learning activities
- To enable students to work actively with their peers in practice
- Teachers are not wise in the classroom
- Allowing the teacher to help students more in class applications
- Helping students to reduce student behavior problems in classroom management due to interactive activities with students
- One-on-one and small groups of teachers
- Allows the teacher to save time spent explaining the subject and repeating it
- Teachers to collaborate in material preparation
- Improvement of communication between teacher and student.

Based for these advantages flip classes also bring some problems. These are (Smith, 2016);

- To increase the workload of the teacher
- To reduce the content of the lesson because of the intensity and the over-learning
- Some activities and strategies planned in the class can not make them useful

- The resistance of the students
- Unprepared participation of students
- Inadequate use of technology.

## Use of the Flip Classes with FATİH Project

The Fatih Project have created an intelligent classroom with at least one multi-purpose copier, a smart board, a document camera and a micro camera. These classes will be separate from normal classrooms. In addition, the teacher's guidebook will be run entirely through the computer, from the throne. Students will be able to use materials such as pictures, videos and music related to the course. Teachers will receive training on this subject. In addition to have an internet broadband connection in both the intelligent classroom and the classrooms, a secure internet system will be implemented which is initiated by the fact that the schools are the education bases and for educational and training purposes(Fatih Project, 2014),

Various multimedia materials, such as simulations, visuals, videos, films, internet resources provided, can easily be displayed at the same time for the classes in the FATIH Project, which provides a tablet for each student. Pre-prepared notes, diagrams and exercises can be presented more quickly and effectively since they are in the electronic environment. The use of tablets in the electronic network environment is considered to be effective in attracting the attention of the learner and keeping the interest in the course. However, the extent to which electronic technologies used can be "interactive" with traditional teacher-centered information transfer depends largely on the adopted educational model, software, content, and teaching style, learning and application capacities of teachers. Interaction of pedagogy is considered to play a key role in the transformation of learning processes.

In the implementation of the flip classes, the inclusion of teachers and students in the context of the FATIH project, and the inclusion of teacher studies in the whole class will be increasingly used in an active discussion environment and cooperation.

Tablets can be used as easy-to-carry classroom tools that can be loaded with a large number of electronic and interactive course materials. Perhaps most importantly, each student will be able to reach a variety of detailed information about the student through methods such as assessment with a tablet application, real-time feedback, questionnaires, analysis of statistics on learning. Finally, tablets can be used as a bridge between school and home, providing use outside school, since they are portable and can connect to the Internet at any time (Education Reform Initiative, 2013).

Being able to draw the right data among millions of data and analyse the related one will make it easier to win students by an individual educational tool who haven’t been included before and also become a source of information in terms of directing students to the right profession considering the interest and success fields. It is must to conduct individual data analysis to win a student individually (Fatih Project, 2014).

The FATIH project consists of five main components. These:

- Providing hard ware and soft ware infrastructure,
- Providing and managing educational e-content,
- Use of effective information technologies in curricula,
- In-service training of teachers,
- Ensuring the use of conscious, secure, manageable and measurable computer technology

(Fatih Project, 2012).

### The Future Foresight for FATIH Project

Within the scope of the FATIH project that was laid in 2011, the studies for the Fatih project will accelerate during the education and training period of 2018-2019. While the management of the project is completely transferred to the Ministry of National Education, in 2018 - 2019 academic year, 2 million 700 thousand computers are expected to be distributed to 5th and 9th grades, and about 200 thousand computers to teachers. With the new arrangement, teachers will be given a new computer every 4 years and students will be given new computers in grades 5 to 9.

FATİH project with two-in-one computers will be distributed. In this context, in addition to primary schools, vocational and special education institutions will be included in the scope of FATİH Project. The Ministry of National Education annonced that they are planning to distribute keyboard computers instead of tablets in order to be able to process the coding courses. It is an indisputable fact that the number of computers that will be distributed as a result of expanding the scope of Fatih project will increase significantly (Sanalbasın, 2018).

## Conclusion & Proposals

In this study, a detailed investigation of the flip classes has been carried out and it is predicted that the flip classes can be implemented in the ongoing FATIH (Action for Increasing Opportunities and Technological Improvement Movement) Project. In this context, the concept of inverse class is explained by the research, its properties are explained and important international researches have been examined. With the use of flip classes, students have the opportunity to study educational material at a speed appropriate with their perception speeds. With this method, learning becomes a phenomenon managed by the learners according to the individual speed of the students. In the classroom environment, educational and critical thinking-promoting activities and teaching activities designed for the teaching material provided in advance take place in a free environment where the teacher takes the role of consultant and directing role.

The electronic support teaching tools to be used within the scope of the FATIH Project may have important place in the implementation of the flip classes. For this purpose, electronic course contents can be presented as synchronous or asynchronous with the help of tablets in video, animation and visually interactive manner. Lessons can be carried out at the classroom with homework and activity based studies. The following subjects are required to be prepared and regulated in order to pass the vitalization within the scope of the flip classes. These are;

- Creation of inverse class awareness, training and motivation: The class and characteristics of the flip must be well known by both the students and the teachers. Conferences and informational meetings can be held in this regard.
- Preparing the existing technological infrastructure and tools for the flip classes: Technological tools should be provided for internet connection in the environments where the classroom activities will be carried out, loading of the course materials into the tablets or downloading from the central institutional server from the internet, application of the tablets and running of course contents. For this purpose, the institution should also prepare for technical support and problem solving. In addition, the registration, follow-up and evaluation of users should be carried out by system administrators, especially the course teacher.
- Pilot application: Prior to actual implementation, application should be made on a topic or

module basis to ensure that the course is feasible and to see the developments and developments.

- Preparation for evaluation, restructuring and actual implementation: necessary remediation, improvements and improvements should be made as a result of the application. Additional technological requirements must be considered in this regard.

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