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From the Editors

Dear IJCE readers,

We proudly introduce the IJCE's first issue of second volume. IJCE, International Journal of Computers in Education is an international, peer-reviewed e-journal which publishes high quality and original research and review papers conducted in the field of computers in education. IJCE is being published biannually (June and December). IJCE is an open access journal which means all content freely available without any charge. IJCE is accepting the new submissions as full article in English or in Turkish. We hope that IJCE will be an international premier source for those who seek and pursuit knowledge in the field of computers in education.

In this issue of our journal we have a total of two articles. Title of the 1st article is "Strengths in Using Social Media Facebook as an Educational Technology" written Chris Prince Udochukwu NJOKU. In this article, the author aimed to investigate the innovative use of Facebook in learning and teaching. Title of the 2nd article is "The Prediction of the Use of Flip Classes with FATİH Project" written by Alaattin PARLAKKILIÇ. In this article, the author discussed the applicability of flip classroom in ongoing Fatih Project.

Thanks to everyone for contributing and/or becoming the reviewer of our journal. Hope to meet you in the next issue of IJCE.

Dr. Serkan Çankaya

Dr. Eyup Yünkül

Yours respectfully

Editors in Chief

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Strengths in Using Social Media Facebook as an Educational Technology

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Abstract - Though the social media Facebook was not originally an educational technology, its innovative use in teaching and learning may be the only e-learning experience students and teachers in resource-poor areas may have. Such use also has the potential to solve the globally highlighted problem that Facebook distracts students. Amidst peculiar challenges (poor technology skills, low-speed and unstable Internet connection and treacherous power supply) fifteen lecturers and their 2,019 students—motivated through participatory learning and action—agreed, learned, implemented, observed and evaluated their academic use of Facebook in four semesters. Data collected through questionnaire and periodic face-to-face and online interviews showed, among others, 56% of students understood course topics more; 92% collaborated more than they did elsewhere; 72% participated more in class discussions;. 70% spent for course activities on Facebook 80% of the time they used to spend on Facebook. Impact on students' grades needs an investigation.

Keywords: Facebook, educational technology, e-learning, social media, teaching

Introduction

Globally, very many higher education teachers cry aloud against the extent to which Facebook distracts students (Al-Rahmi et al., 2014, Junco & Cotten, 2012, Chen & Bryer, 2012, Dahlstrom et al., 2011, Junco, 2011, Roblyer et al., 2010, Ajjan & Hartshorne, 2008). Yet nobody has been able to stop students from using Facebook for what it really is. Adekunle (2018, p. 38) while describing trends in using social media as substitutes for class interaction, observed: "...students in Nigeria use social media more for entertainment than for academic engagement."

It is noteworthy that social media (including Facebook) were not developed as educational technologies. Their developers intended them for networking and socializing, specifically for sharing information over the Internet (Reuben, 2008) not only through text, pictures and videos but also as audio recording. Using social media for these purposes is a global practice, and nothing truly is wrong with that. What is wrong is that students socialize and network on Facebook to such a degree that they pay less attention to their academic obligations.

Andersson et al. (2014) surveyed the experiences which teachers and students in three schools in Sweden had while using Facebook as a social medium. The researchers' respondents were unanimous that use of Facebook distracted students from learning and teachers could not strategize toward addressing the challenge. Hence, the researchers called for urgent measures to rescue students. The call might be because attempts already made by many educators to engage students on Facebook still had not addressed the challenge. In fact, Rockmore (2014) reported that when students had laptops during class sessions, teaching through Facebook distracted the students such that some computer science professors in the United States of America (USA) argued for banning use of laptop during lectures. Other authors who reported on attempts to engage students on Facebook include Matzat and Vrieling (2015), Bugler (2014), Yang et al. (2014), Megele (2014), Goodband et al. (2012), Lam (2012), Willems and Bateman (2011), Bosch (2009) and Sendall et al. (2008). Only two of these attempts (those of Bugler and Bosch) were in African institutions. Lecturers in Bosch's report used Facebook only for contacting students more easily and quickly, while in Bugler's report, students used Facebook for only sharing resources. Although Facebook was created for social

communication, there still should be ways of using this communication function for noticeable good academic impact. This relates to why Al-Rahmi et al. (2017) investigated the use of Facebook and other social media for collaborative learning and engagement, but they explored this only in the learning of Quran and Hadith. They reported students' responses that they (students) had used social media for collaborative learning, sharing, discussion and publishing. The responses seem predictive and yet to be proved, considering the authors' statement that the students *believed* that social media *could* be used positively and... *could* provide significant interaction, engagement and collaborative learning. In an experiment earlier, Tananuraksakul (2015) found that students developed positive attitude and motivation to learn English when Facebook was incorporated into an "English as a Second Language" class in a Thai university. Since Facebook could engender in students such positive attitude and motivation to learn, there is possibility that Facebook can become more attractive than distractive to learning not only Quran, Hadith and English but also many other subjects. It is, therefore, needful that teachers and students in various disciplines should be helped to together use Facebook innovatively, beyond its social interaction purpose, as an educational technology.

Popularity and Educational Potentiality of Facebook

Facebook is an online social medium with a physical office in Menlo Park, California. It was developed by Mark Zukerberg in 2004 (Mitchell 2012) and helps a person to connect with other persons (relations, friends and new people) for sharing information as text, photographs, audio recording and videos. Because of what it does and how popular it has become, used by people of all ages and various vocations, Facebook is among today's frontline information and communication technologies (ICTs).

Of 4,156,932,140 Internet users in the world as at 31 December 2017; 453, 329,534 (10.9%) were in Africa ([https://www.internetworldstats.com/stats1.htm). Over 52% of the world's Internet users were monthly active users of Facebook in that period, and 79% of them used it on mobile devices (https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/). Africans on Facebook at the time were 177,005,000 (8.4% of the global figure) (https://www.internetworldstats.com/stats1.htm). A study in Australia found that http://www.facebook.com ranked fourth among Web sites most visited (Ng 2010). As in the United Kingdom (UK) where 95% of people aged from 14 to 34 years registered on at least one online social medium (Social Media Experts 2011), most Facebook users (82%) in the world are below 45 years (https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/). This suggests that very many youths who are in higher education institutions are on Facebook. Whatever they do there that is irrelevant to their studies, and however often they do it, they enjoy it and, as affirmed by El-Hoby and Zeki (2015) and Brady et al. (2010) more students are signing up. That texts, photographs, audio recording and videos are shared free-of-charge through the medium is an opportunity which educators must seize to reduce the negative impact of students' use of Facebook and to enhance learning and teaching in higher education institutions. Sendall et al. (2008) were right when they observed, in the use of Facebook in three universities in the USA, that skills in using Facebook and other social media were generally essential in university education.

Also, "New types of learning activities challenge our thinking as to how learning might be facilitated, creating new etiquettes of learning and teaching, and shifting the locus of control from the teacher to the learner" (Littlejohn et al, 2006). It was in the 1990s that many new thoughts about learning arose, chiefly from Vygotsky's socio-cultural psychology and Engeström's activity theory. The resultant student-centred learning, extensively propagated by cognitive learning theories, is the focus of quality education at present and will remain in

future education. For learners to actually control their learning, they need to be only guided and given freedom to discover knowledge through harmless activities, fora and media that appeal to them. Facebook has these three fronts and so lends itself well to enhancing learning if it is adapted to users' peculiar circumstances.

Research Objectives

There are more hours outside the physical classroom than inside it, and, as already noted, the time higher education students spend on Facebook (usually with their mobile phones) outside the brick-walled classroom doing what is unrelated to their academic programmes is a great concern. Again, students lose so much time, which negatively affects their learning, when lecturers miss lectures to go for necessary fellowships or sabbatical leave or to attend inevitable conferences and other meetings. As in many HEIs globally, these are top-level challenges added to technical and monetary difficulties students and faculty face in a Nigerian university. Consequently, the project set out to achieve the following:

1. Discover whether students can use Facebook more for academic activities than for activities unrelated to course work;
2. Discover how lecturers can engage students on Facebook when being absent in the physical classroom is inevitable;
3. Discover how students and lecturers can cope with economic and infrastructural challenges associated with use of the Internet (on which Facebook is) in African HEIs;
4. Discover gains and losses not mentioned in existing literature, of using Facebook for learning and teaching in HEIs;
5. Make recommendation(s) for or against use of Facebook in learning and teaching.

Technologies Used in the Project

The Internet, Facebook and Wi-fi-enabled laptop computers or mobile phones were the fundamental technologies used in this project. The mobile phones had WAP (Wireless Application Protocol) or GPRS (General Packet Radio Service) or EDGE (Enhanced Data rates for Global Evolution) or HSDPA (High Speed Downlink Packet Access) or 3G/4G/5G (3rd/4th/5th generation of cellular network) and could also download and upload files to Websites. Wi-fi enables a computer to connect to the Internet through a wireless local area network (WLAN). WAP, GPRS, EDGE, HSDPA, 3G, 4G and 5G enable mobile phones to connect to the Internet.

Methodology

This is an action research or a field study done over two years, spaning four semesters. Because it involved the adaptation of a non-traditional learning technology in an environment where ICTs are being newly embraced, ethnographic methodology with participatory learning and action (PLA) was used. Ethnographic methodology is a participant-observation method involving one investigator who lives both with and as their research participants (Genzuk, 2003, Harris & Johnson, 2000, Van Maanen, 1996). It, therefore, recognized the setbacks and challenges of students and lecturers in the university where the work was done, and data in this report came mainly from participants' observations and experiences. Participants, who were selected and trained through PLA, were involved fully in planning and execution of their training and the project. They observed their individual and collective academic use of Facebook in relation to what they knew Facebook to be.

1,700 lecturers received e-mail call for participation. 650 expressed interest. A rigorous, online task-based process produced only fifteen (15) lecturers who had the required level of

interest, ICT literacy and suitable devices and would commit time and resources voluntarily. The fifteen lecturers taught 2,019 undergraduate students in the following academic programs: History and International Studies, Linguistics, Arts Education, Health and Physical Education, Social Science Education, Vocational Teacher Education, Microbiology, Electrical Engineering, Civil Engineering, and Medicine.

In accepting to participate, participants considered that Facebook was available and familiar to them. Students confirmed their familiarity with the technology when they were asked to list ICTs they had been using privately for other purposes and never knew they could be used in learning or teaching (Table 1). Throughout the project period, participants provided technical support for one another within their abilities to do so. A participant who had any challenge reached out to others through an e-mail list for the project or through phone calls. The researcher who was the only ICT and e-learning specialist in the team handled cases that were beyond participants' abilities.

The researcher collected data through questionnaires and periodic interviews, selecting students at random for interview. While all participants got questionnaire (containing structured questions) at the end of each semester and of the project, only fifty students (five students in each of the ten programmes) and all the fifteen lecturers were additionally interviewed with unstructured questions. Participants received questions in search of how much they used ICT (particularly Facebook) before the project, what they actually did in the project, setbacks, any positive and negative impact, their perception of the academic use of Facebook, and strategies for progress. Some interviews were face-to-face. Others were online through chats on Facebook. By e-mail, participants received and submitted the questionnaires created with Google Forms™, which is an online survey tool (https://www.google.com/forms) that automatically collates and charts data fed into it. Analyses of data were both quantitative and qualitative.

Findings and Discussion

Student-participants in this project and their lecturers had been using ICTs before the project began, except only 3% of the students who claimed they had not used any form of ICT. Interestingly, none of the participants (both students and lecturers) had ever used any ICT in their teaching or learning. With a pre-project interview through which they made these revelations, the researcher also found that the lecturers frequently went online (through campus WLAN or by using a mobile phone data connection when the WLAN was weak) mainly in search of resources for their research or to submit manuscripts. A vocational teacher education lecturer said:

> I never knew or even thought of the Internet and mobile phone as teaching apparatus. I use my phone only for calls and text messages (personal and office) and the Internet for e-mail and my researches mainly. I sometimes connect to the Internet on my phone anyway.

Below are the words of another lecturer, in Department of Microbiology:

> I've been on Facebook and WhatsApp, both of which I often access on my smartphone. I post and read things, send and receive messages, upload and download photos and videos, but only to and from relations and friends. So, I'm excited that Facebook can be a teaching tool and can't wait to try it out. That's why I'm eager to participate in your project.

All the lecturers had the appropriate computers and mobile phones with which they connected to the Internet and accessed Facebook throughout the project duration.

The students had used different forms of ICT (specifically nine, as on Table 1). Six of the ICTs, including Facebook, were for communicating and sharing information in various formats, which implies that the students must have been using them to communicate with relations and friends, just as their lecturers were doing. but only 10% had not used Facebook (Table 1). Tables 2 and 3 contain the trend of ownership of required computers and mobile phones by the students during the project period. The two tables have further descriptions of the students' computers and phones. These tables are significant, because they highlight the possibility that students will be motivated to invest in technologies for their learning when Facebook (or other social media and communication technologies which students are fond of) are creatively used as educational technology. This has proved **one gain of using Facebook in teaching and learning, not mentioned in existing literature**. A food for thought then for educators and education administrators/policy makers is that technologies students frequently use, even when they are not traditionally related to education, are good resources to start with when stepping toward technology-enhanced learning. A remarkable advantage the students also exploited is that they always had their mobile phones on them and could access Facebook on the phones. This points to the role of mobile technologies in learning, as United Nations Educational, Scientific and Cultural Organization (UNESCO, 2012) described them as having great potential to help teachers improve learning outcomes, both in and out of the classroom.

Table 1
Forms of ICT which students were using privately for purposes other than their university education, before commencement of project

ICT used before start of project	Number of students who used it	Percentage of 2,019 students
Facebook	1820	90
E-mail	1190	59
Mobile phone	2019	100
Yahoo Messenger or any other instant messenger	630	31
Skype	210	10
Google Talk (Hangout)	420	21
Digital video and audio	420	21
Digital photography camera	350	17
Microsoft PowerPoint	350	17
None other than mobile phone for call and text messaging	70	3

Table 2
Students' ownership of personal computers and mobile phones in Semester 1 of Year 1, when project took off

Students who did not own computer		Students who owned computer		All the students owned mobile phone			
38%		62%		100%			
'You don't own a computer, do you plan to own one?'		0% of computers were desktop	100% of computers were laptop	3% of phones couldn't connect to the Internet	97% of phones could connect to the Internet (that is, they were Internet-capable)		
10% No	90% Yes		89% of the laptop computers had Wi-fi	11% did not have Wi-fi	28% of Internet-capable phones couldn't download and couldn't upload files	44% could download and upload files	28% could download but couldn't upload

Devices that could connect to the Internet and could download and upload files were necessary for the project. Those students (3%) whose phones could not connect to the Internet in Semester 1, Year 1 (Table 2) and in Semester 2, Year 1 (Table 3) came into the second year with Internet-capable phones, as can be seen in the cells having 0% on Table 3.

Table 3
Students' ownership of personal computers and mobile phones in last three semesters

	Students who did not own computer	Students who owned computer	Students whose phones couldn't connect to the Internet	Students whose phones could connect to the Internet but could neither download nor upload files	Students whose phones could connect to the Internet and could download and upload Files	Students whose phones could connect to the Internet and could download but couldn't upload files
Semester 2, Year 1	36%	64%	3%	27%	46%	27%
Semester 1, Year 2	29%	71%	0%	20%	55%	25%
Semester 2, Year 2	25%	75%	0%	16%	64%	20%

Similarly, (also on Table 3) in first and second semesters of second year, there were increases in numbers of students whose phones were Internet-capable and could download and upload files. These increases equated to a decrease in the number of students whose phones could neither download nor upload files or could download but could not upload files in each of the semesters in the second year. In the second semester of Year 1, 2% of the students who did not own a computer acquired a computer, decreasing the number to 36% from the 38% it was in first semester of Year 1. This increase in students' voluntary ownership of laptop computers continued in the second year until only 25% of the students had no computer as at the conclusion of the project. This is a good indication of most students' willingness to learn with technology in the face of inadequate infrastructure, absence of institutional policy, low economic status, and some other factors that slow uptake of technology to education.

Can Students Use Facebook more for Academic Activities than For Activities Unrelated to Course Work?

One outstanding discovery made in this study is that 86% of the students were happy for their use of Facebook in learning. Seventy percent (70%) were able to spend for course-related activities through Facebook 80% of the time they used to spend on Facebook. Sixteen percent (16%) dedicated between 40% and 80% of such time to learning with Facebook. These 86% of the students developed more positive attitude to their academic work than the 9% who were yet to decide on how far they would want to learn with Facebook and 5% who were just uninterested. All these were exemplified in how students who had no Wi-fi-enabled computers and those whose mobile phones could not download and/or upload files (as on Table 2) voluntarily adopted alternative measures to go online (Figure 1) and acquired suitable devices during the project (Table 3). Students (14%) who were unhappy using Facebook to learn gave reasons for their unhappiness (Table 4).

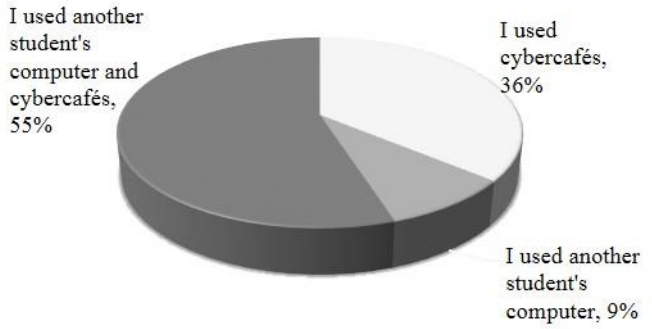

Figure 1. Measures voluntarily adopted by students who had no computers and their mobile phones could neither download nor upload files

Table 4
Reasons given by 14% of the students for being unhappy with use of Facebook in learning

Reason for being unhappy with use of Facebook in learning	Percentage of the unhappy students, who gave the reason
It's stressful	20.1
It imposes additional cost on me	19.5
It's stressful and imposes additional cost	20.4
It's a waste of time	40.0

Noted also was that students and lecturers participated in class work when they were away from campus. "I am excited that Facebook can help me to solve the problem of my often inevitable absence from face-to-face lectures," said a student of Health and Physical Education. A History and International Studies professor who travels a lot commented, with a sense of satisfaction:

> While I was in the UK for six months, I could still engage my undergraduate and postgraduate students. I scheduled class meetings with them on Facebook and we discussed topics, critiqued books, asked and answered questions, in real-time. Some other times I posted assignments that they responded to at their own times within a deadline. The students enjoyed all that. It's really awesome, something I think every lecturer should adopt. I noticed that the students no longer give so much time to those other social media things that take their attention away from their studies. I strongly think I'll continue to use the platform in my teaching.

The professor had, indeed, put that thought into action.

Because lecturers' use of Facebook for teaching helped them to work with students, from anywhere, at any time of the 24-hour day and on any day of the seven-day week, their missing face-to-face lectures (to be in administrative meetings, to travel for conferences, et cetera and to do other engagements) no longer meant lost academic time. Thus, there was **a significant reduction in the time usually lost to travels and non-academic engagements** by both students and lecturers. These results and some other findings recorded below show that students can use Facebook more for academic activities than for activities unrelated to course work.

Learning Activities Which Students Engaged In

Students engaged in the following learning activities:

1. Collaborative search of the Internet for course-related resources whose Web links the students shared through Facebook;
2. Initiating and leading or participating in synchronous and/or asynchronous course-related chat or discussions on Facebook;
3. Communicating, at distances, social and academic messages with lecturer and class members;
4. Producing and sharing digital still and motion pictures to communicate emotions and educational insights and show creativity.

All the above support the fact (asserted by Bransford et al., 2000) that there must be opportunities for students to learn with understanding so as to develop competence, since factual information can only transform into usable knowledge when subject matter is deeply understood. Kirkwood and Price (2014) also stated acceptably that if qualitative changes in student learning were expected, then the associated activities must give them the opportunity to develop and practice appropriately.

How did the Lecturers Engage the Students on Facebook When Being Absent in the Physical Classroom was Inevitable?

Judging from their instructional activities on Facebook, lecturers used the social medium as a sort of learning management system (LMS). They created Facebook groups for their classes. They gave assignments through the groups—including ones that required working in small groups for which students created ancillary Facebook groups. Students uploaded completed assignments to their classes Facebook groups, making a student's work available not only to the lecturer but also to the other students. This brought about self-assessment, cross-breeding of ideas, and peer teaching, meaning that Facebook lends itself well to what education experts call collaborative or cooperative learning and to Schwab's "Community of Learners" concept (Schwab, 1976).

To the classes' Facebook groups, lecturers also uploaded course textbooks, lecture notes and reading lists. They as well posted Web links to online pubications, videos and podcasts they wanted their students to work with. Groups with twenty-five members or fewer sometimes held synchronous discussions, using Facebook Messenger™, on a lecture note or another author's book/article. Lecturers and students additionally posted announcements related to change of meeting time/venue, checking information on a Website or on physical notice-board or somewhere else, date of examination or test, reminder of deadline for submitting completed assignments. They also posted announcements of birth, death and marriage

involving class members. Academic advising and mentoring were other tasks lecturers did through Facebook.

How did Students and Lecturers Cope with Economic and Infrastructural Challenges Associated with use of the Internet?

During participants' training which was the starting phase of the project, steady power supply was maintained by covering frequent public power outages with a hired standby electricity generator, which guaranteed Internet connection throughout the sessions. The unreliability of public power supply was also customary during the technology application phase. Measures fruitfully adopted against the challenge were: 1) lecturers' use of their private electricity generators more frequently than usual in their homes; 2) use of commercial cybercafés by students and lecturers sometimes, as the cybercafés rely on standby electricity generators. The measures involved costs, which all the lecturers and a majority of the students happily bore, in their curiosity for the outcomes of what they believed was an interesting novelty.

Another infrastructural challenge was the campus wireless network whose connection "comes and goes," according to a student, "and there are days I can't connect at all." "At times, the connection is so slow that a Website takes what seems like ages to open. It's frustrating," complained another student. Whenever the network was not accessible or connecting to it was that frustrating, 52% of the 1,252 students who owned computers went online through commercial cybercafés, 34% used either mobile phone data connectivity or a universal serial bus (USB) HSDPA modem they would plug into their computers, or both, and 14% did not use any alternative.

All the students who used alternatives to campus network or to their lack of suitable computer and mobile phone cut down their spending on drinks, snacks, clothing and miscellaneous personal items in order to afford the costs of those alternatives. This is a good step toward acquiring prioritization skill and making judicious use of money. In low-income countries, these skills are in high demand.

More Outcomes

The instructional and learning activities that lecturers and students engaged in resulted in increased participation in class discussions, increased student-student collaboration, improved student-lecturer communication, and more understanding of subjects. They again resulted in students' acquisition of critical technology skills (word processing, searching the Internet, digital audio/video recording, etc.) and non-technology (soft) skills (problem-solving, critical thinking, organizational, etc.). Furthermore, students became wiser in their use of money and, together with the lecturers, friendlier to the environment. All these and more are discussed in the paragraphs that follow.

Apart from collaboration and improved student-lecturer and student-student communication, these outcomes have scantily been noted by earlier investigators. Even with regard to student-lecturer communication, this project found additionally that **students submitted completed assignments more promptly than they did offline, their customary problem of physically going to a lecturer's office and not meeting them was solved, and lecturers gave one-to-one attention to students as they never had done**. A 100-level student of Electronic Engineering gave a clue to how these happened.

> Before this project, it was very hard to see this lecturer after lecture hours. He is not always in his office. Through this use of Facebook with him, he is now available 2, 4, and can take and answer personal questions. I'm happy for this (said the student).

"2, 4" in the quotation above is a youth's slang meaning twenty-four hours of the day. A text-response sent by a 300-level student of Linguistics during an interview with Facebook Messenger™ goes thus: "It [use of Facebook for one of her Linguistics courses] saves d stress of visiting [the lecturer's] office as he is not alwz around." In this text-response, "d" stands for "the", and "alwz" stands for "always". Truly, because of difficulty in their accessing some lecturers in person, students may be unable to hand in completed assignments within the time-frame if the process is offline.

Increased Participation

As Figure 2 illustrates, close to three-quarters of the students participated in class discussions more than they did prior to the project. Two factors resulted in this. Firstly, students who were usually passive in class discussions owing to speech disorder (like stammering), absent-mindedness, and shyness (because the students do not want to be ridiculed for errors or wrong answers) became active. These students sent opinions or questions as text messages to discussions moved to Facebook, without fear of faces or of being ridiculed. Secondly, asynchronous Facebook discussion allowed reflection on topics and expressing one's understanding or questions at one's own time. These show that online class discussion activity stimulates engagement, can deepen discussions, and agrees to the finding by Pilotti et al. (2017) that there is a relationship between asynchronous online class and cognitive engagement and depth of discussions.

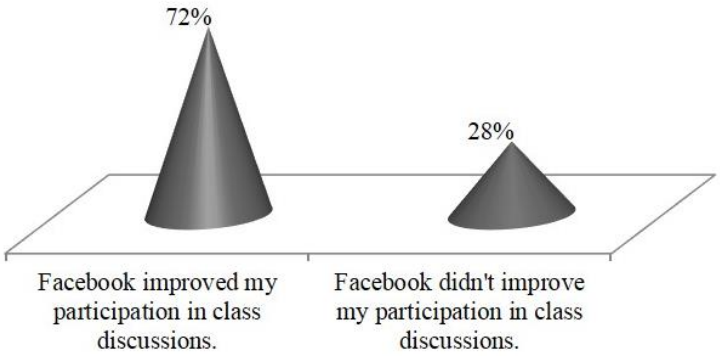

Figure 2. Facebook's impact on students' participation in class discussions

The students whose participation was not affected were chiefly the very active members of the class. They did not see any difference between an online discussion and an offline one, except that their online discussions on Facebook were by text, while offline discussions were oral.

Increased Academic Collaboration and Communication

It is not arguable that without ICTs, students collaborate and communicate in their studies. Figure 3 and Figure 4, however, show that it is unlikely that students can collaborate and communicate more without Facebook than with it. For example, in the first semester of the project (Semester 1, Year 1) 14% of the students indicated they were not collaborating before, but by the end of the project (Semester 2, Year 2) they had all started collaborating (which is what the 0% at the top of the Figure 3 represents). The number of students (n) that can collaborate or communicate face-to-face is most likely always less than the number that can collaborate or communicate on Facebook. This is because Facebook extends contact time (t) and number of students (n) that can be in contact. Students collaborate or communicate without ICTs only when they meet face-to-face, but with Facebook they continue the activity when they disperse even to very distant places (for example, when they are on vacation).

$$\mathbf{t}_{\text{Facebook}} > \mathbf{t}_{\text{face-to-face}}$$

$$\mathbf{n}_{\text{Facebook}} > \mathbf{n}_{\text{face-to-face}}$$

Another interesting occurrence is that no student collaborated more earlier than they did at their present time (0% in Semester 1, Year 1 and 0% in Semester 2, Year 2). This indicates that the more Facebook was used as educational technology, the more collaborative learning the students did, proved by the tall bars on Figure 3 (62% in more collaboration in Year 1 but 92% more collaboration in Year 2).

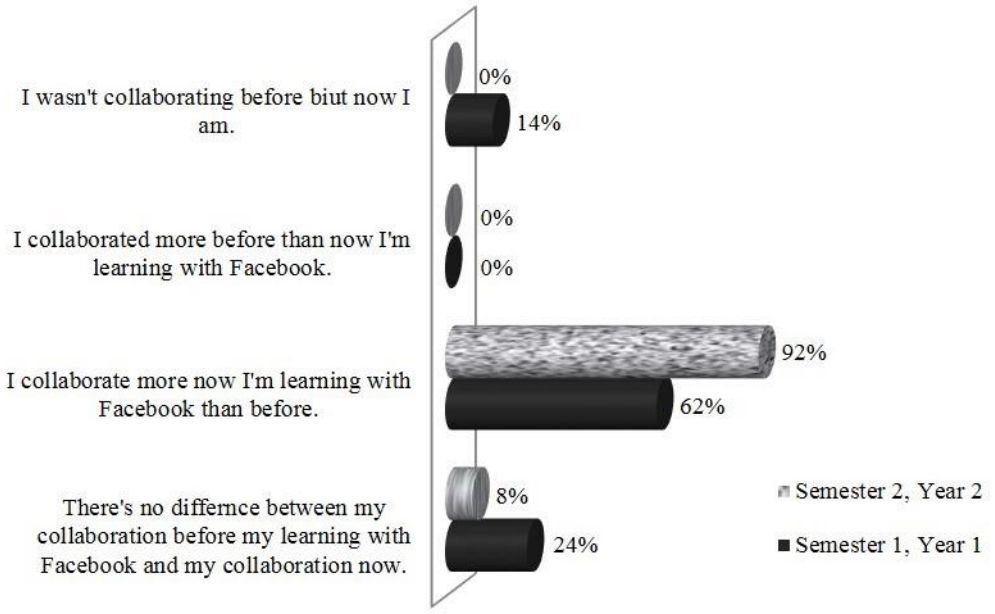

Figure 3. How Facebook affected students' collaboration in learning

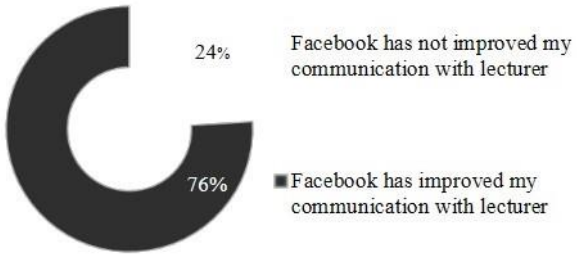

Figure 4. Facebook's impact on lecturer-student communication

Increased Understanding of Course Topics

One of the structured evaluation questions given to students in the fourth (final) semester of the project was: "Has the integration of Facebook into your studies contributed to your understanding of course topics better?" Over one-half of the students responded in the affirmative (Figure 5). This impact must have resulted from the new learning activities (as listed earlier on this paper) the students engaged in. The activities must have ultimately led the affected students to the path of independent inquiry and consequent better understanding of course topics and helped them to develop the non-technology skills and abilities on Table 5. All these align with education theories and work out competence in the students, agreeing also with Bransford, Brown & Cocking (2000) who argued that there must be opportunities for students to learn with understanding so as to develop competence, since factual information could only transform into usable knowledge when subject matter was deeply understood. The students (41%) who saw no improvement in their levels of understanding and

those other few (3%) who did not know whether or not the technology helped their understanding may need longer time of educational use of the technology.

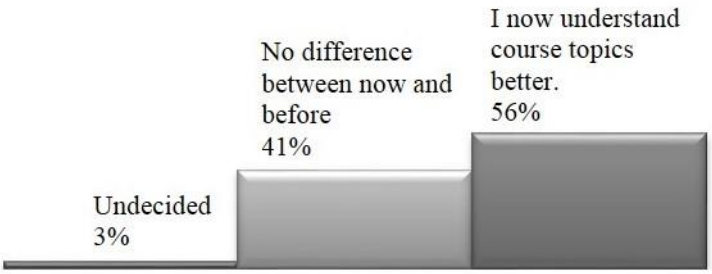

Figure 5. Students' reactions as to whether use of Facebook in learning had helped them in understanding course topics

Acquisition of 21st Century Skills

On Table 5, it can be seen that students acquired numerous technology and non-technology skills relevant to living productively in the 21st century and beyond. The acquisition progressed as semesters advanced. This shows that as Facebook was being used for courses, students grew in skills. From the way the students answered evaluation questions, they had not most of those skills and abilities prior to learning with Facebook, and the technology improved the skills and abilities they got earlier. No wonder Sendall et al. (2008) asserted that skills in the use of social media were generally essential in university education.

Table 5.
Skills acquired by students through learning with Facebook

Skills acquired by the students through learning with Facebook	By end of Semester 2, Year 1 of project		By end of Semester 2, Year 2 of project	
	Number of students who acquired	% of total number of students	Number of students who acquired	% of total number of students
- Word-processing	1,601	79	1,817	90
- Searching the Internet	1,454	72	2,019	100
- Downloading from and uploading to the Internet	1,393	69	2,019	100
- Setting up and using mobile phone to connect to and browse the Internet	1,253	62	1,353	67
- Collaboration skill	1,252	62	1.857	92
- Problem-solving skill (I can now solve many of my academic and other problems without depending on anybody.)	1,191	59	1,575	78
- Communication skill	969	48	1,796	89
- Initiative (I can now initiate a discussion and/or an activity/event.)	909	45	1,837	91
- Thinking critically about topics and ideas	835	41	1,758	87
- Relationship skill (I can now easily open and maintain relationship with people.)	835	41	1,900	94
- Organisational skill (I can now organise learning or discussion groups and events.)	767	38	1,778	88
- Video/audio recording with digital camera and/or mobile phone	424	21	1,778	88
- Still photography using digital camera and/or mobile phone	424	21	1,958	97
- Use of MS Excel or other spreadsheet	283	14	284	14
- None	69	3	0	0

The 3% of students (on Table 5) who did not acquire any skill in Year 1 but did in Year 2 and the increased number of students for most skills in Year 2 mean that technologies may not impact on one student at the time it impacts on another student. This suggests that continuous use of technology in teaching and learning is necessary for all students in a class to experience the same improved learning outcomes. Students then need to be consistently encouraged and motivated in word and deed to persevere in their use of technologies for learning.

Financial Prudence and Savings by Students

This project also revealed that students' expense in printing and packaging their reports of assignments reduced significantly. The 300-level Linguistics student who was quoted earlier added that the use of Facebook for one of her courses "has really helped a lot...it saves d stress of printing out works." With the word "stress", she means both the cost of printing and the time for going to and from where the printing is done. Students in the university spend about 2.56 United States Dollars (USD) to print a twenty-page word-processed report of an assignment. Only 0.75 USD (75 cents) is spent to upload such a report and more files to Facebook through a commercial cybercafé or a mobile phone or data modem. Through the campus WLAN, a student spends only 0.18 USD (18 cents) to upload to the Internet as many files as they want in 24 hours. This reduced-spending means much in Africa and other low-income parts of the world where many students find funding their education a bit difficult.

More Environment-friendly Students and Lecturers

Printed or handwritten works by students had always constituted large heaps of refuse for lecturers, and often they had not been properly disposed of. Papers were not involved when lecturers gave assignments to students and received responses through the online platform. This left a positive impact on the environment. The impact will be more visible when more lecturers and students adopt Facebook and/or other online platforms for teaching and learning.

Impact Time Varies from One Student to Another

From the data presented with Figures 2, 3, 4 and 5 and Tables 2, 3 and 5 and from the discussion so far, it can be generally said that use of Facebook as an educational technology may not impact on one student at the time it impacts on another student. Again, when students are positively affected at defined times, the levels of effect vary. What do these communicate? The message is that the longer technology is applied to education, the better the outcomes.

Privacy Issues

Some lecturers (6%) raised concerns about their privacy regarding being Facebook friends of their students. They complained that students they would not ordinarily want to know some of their (lecturers') personal information knew them, and unwanted messages about every action the students took on Facebook (including annoying tagging to photo) often lined up in their e-mail boxes.

Losses

Apart from internal loss of privacy by a few lecturers, no significant disadvantage arose from this use of Facebook for academic activities. How to effectively carry along the few students who expressed unhappiness remains a challenge, however. This is because since the other students (in majority) made sacrifices to scale through economic and infrastructural challenges, which indicates a strong positive attitude not only to technology in education but also to learning, could it be that the unhappy students have poor attitude to learning? This question is more critical when one considers the reasons on Table 4 alongside the truth that the same students freely spend much time and money on things not related to their studies

(including the normal non-academic use of social media) as is evident on higher education campuses.

Conclusion

With teachers and students' commitment to using alternative Internet connection when institutional WLAN went down, to making several other sacrifices, and to using Facebook's features beyond what they were originally intended (unlike what earlier experimenters did), this use of Facebook as an educational technology yielded a number of surprising positive outcomes. Some important lessons also emerged. These include:

- Students happily reallocated 40 - 80% of the time they spent on Facebook for pleasure to academic activities on Facebook.
- A majority of students experienced increased understanding of course topics, more collaboration, increased participation in class discussions, and increased communication with and access to lecturers.
- Lecturers and students regained the time and learning activities they usually lost when absent in face-to-face class meetings.
- Most students acquired many skills essential for employment and living in the 21st century and beyond.
- Seeking new ways of teaching and learning or of using available technologies can yield positive results beyond expectation;
- Technologies which will enhance learning in one institution are not necessarily those successfully used in another institution, and they do not have to be standard learning technologies, such as LMS;
- Involving lecturers and students in adoption and planning is profitable;
- Sensitization and training are very important, and training should be hands-on, as Olbinger and Olbinger (2005) rightly observed that although teachers and students were comfortable using technology, their understanding of the technology or source quality might be shallow;
- Internet connectivity, power supply and availability of and access to technologies are fundamental, and so there should be a framework and policy for institutional provision and use of technologies to support teaching and learning. One way to do this is to have a very reliable WLAN and departmental Internet laboratories or an acquisition programme that enables students to own Wi-fi laptop computers.

There is the need for sustained use of the technology and of inclusion of other very interesting academic activities in order for every student to happily participate and experience a positive impact. Regarding concerns about privacy, lecturers and students should be frugal about personal information to supply in their Facebook accounts and be cautious about what they post and about turning on "Location" on their mobile devices. They should additionally use Facebook's Settings optimally to control what people can read about them and the kind of notifications they do not like to receive.

Further Recommendations

What was done in this project should be replicated and scaled up in HEIs and high schools anywhere, especially in developing and least-developed countries, as such effective use of Facebook in teaching and learning may be the only e-learning experience most students and teachers in resource-poor areas may get. Because examination grades are still a major measure of students learning, although most educators globally hold that they had not really been very reliable learning indicators, further investigation on the academic use of Facebook (as of any other technology) should focus on its impact on a student's grades.

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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

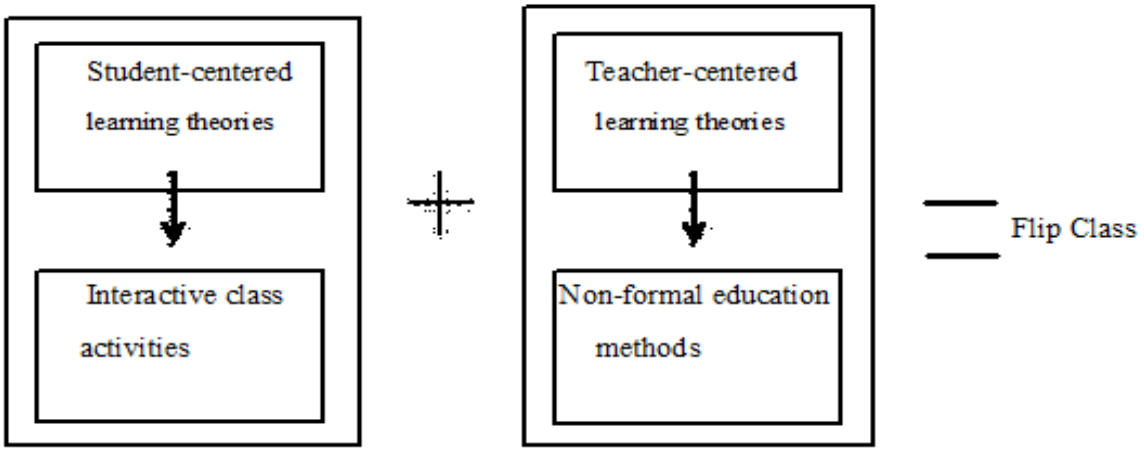

Figure 1. Perspective of flip classes

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).

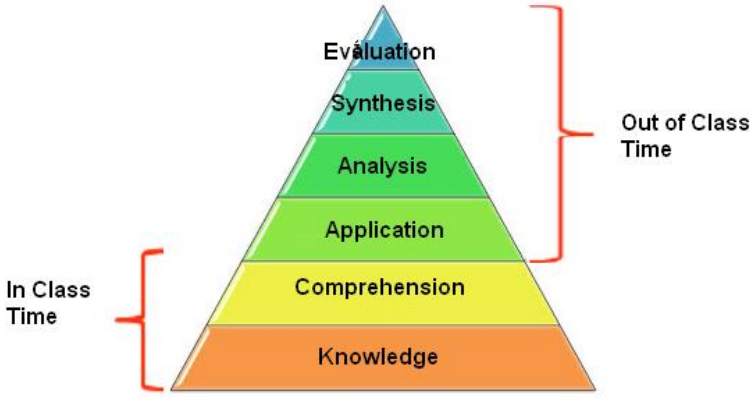

Figure 2. Taxonomy of Bloom in flip classes

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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