# The Use of Tablet PC and Interactive Board from the Perspectives of Teachers and Students: Evaluation of the FATİH Project[*]

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### Abstract

The main purpose of this study was to evaluate the early implementation results of the "Movement of Enhancing Opportunities and Improving Technology", abbreviated as FATIH project from the perspectives of participating teachers and students. Specifically, to investigate (a) whether or not Interactive Boards (IB) and Tablet Computers distributed to teachers and students in the pilot schools were used, (b) the effectiveness of those technologies in teaching and learning, and (c) the problems and issues emerged with regard to use of IB and Tablet computers. To accomplish these goals, 11 schools from 4 different cities were selected. Different data collection instruments (teacher and student questionnaires, semi-structured interviews, in-class observations, and focus groups) were used. The collected data were analyzed using the techniques and procedures of mixed method approach. The results revealed that although there is a promising use of IB, there is limited, in some cases no, use of Tablet computers. Both teachers and students were in favor of IBs, but were also skeptical about Tablet computers. In addition to technical problems, some pedagogical and professional development issues were found to be important results.

### Key Words

FATİH Project, Information Technologies, Tablet PC and Interactive Board Use, Perspectives of Teachers and Students, Technology Integration.

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It is inconceivable that the technology, specifically the information technologies (IT), cannot be kept out of educational systems especially in such an era in which the technological advances are everywhere (Friedman, 2005). Considering the benefits and changes technology brought to in other fields (i.e. banking, e-commerce, communication), educators in the world and in Turkey have been studying and discussing the possibility of technology use in teaching and learning activities through various projects and research studies. According to Çakıroğlu, Akkan, and Güven (2012), technology integration in educational settings is considered as the one of the fundamental reforms. In this sense, US and some other developed countries' governments and institutions have already initiated technology integration projects with large amount of budgets to transform their educational systems (Chen, Kao, & Sheu, 2003; Crompton & Keane, 2012; Dale, 2008; Joureau, 2011; Milli Eğitim Bakanlığı [MEB], 2012a; Ricci, 2011; Quality Education Data, 2004; Russell, O'Dwyer, Bebell, & Tao, 2007; Saine, 2012; Vallance & Numata, 2011).

Similar to the projects implemented in many developed countries, with the aim of enabling equal opportunities to all students (Anderson & Dexter, 2005; Atal & Usluel, 2011; Bonifaz & Zucker, 2004; Coppock, Smith, & Howell, 2009; Dailyrecord, 2010; Eren & İzmirli, 2012; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Fri-tic, 2012; Fourgous, 2010; Gateway, 2004; Ingram, Willcutt, & Jordan, 2008; Kim & Jung, 2010; Laptops for Learning Task Force, 2004; Lesardoises, 2012; Lewin & Luckin, 2010; Lowther, Strahl, Inan, & Ross, 2008; Marcant ,2012; Massé, 2012; News Report, 2007; Ntdtv, 2011; Prensky, 2001; Saran & Seferoğlu 2010; Seferoğlu, 2009; U.S. Department of Education, Office of Educational Technology, 2010; Windschitl & Sahl, 2002). Turkey has also started piloting its government supported technology integration project-FATIH in 2012 at 52 public schools (4 elementary, 48 high school) and planned to extend the project to all public schools in next few years (MEB, 2012b, 2012c).

The main objective of the project has been determined as to transform schools into more productive places in which students learn better. More specifically, the main objectives of the FATİH project are to:

(1) Provide equal educational opportunities to students from different regions; (2) to improve information technologies used in schools, and (3) to integrate technology into teaching and learning activities to support students' learning (MEB, 2012c).

## Purpose

The main purpose of the study was to evaluate the pilot test of FATİH Project based on the data results gathered from 11 schools in 4 different provinces. Based on the perspectives of participating teachers and students, this study investigated the purpose and usage frequency of Interactive Boards (IBs) and Tablet PCs that were distributed as part of the project as well as its flaws and issues emerged from the pilot test.

In order to reach these goals, answers to the following questions were sought:

1. How were the technologies that were provided in the context of the FATİH Project (Interactive Boards and Tablet PCs) used?

2. What were the purposes of those Technologies?

3. What were the issues based on the perspectives of participating teachers and students throughout the pilot test?

## Method

Participants of the study were 181 teachers and 918 students from 11 pilot schools in İzmir, Kayseri, Samsun and Yozgat provinces. Due to the nature of the study, purposive and convenience sampling principles of nonprobability sampling approach were employed to select participants (Fraenkel, Wallen, & Hyun, 2011).

The data collection was a four-stage process. In the first stage, the schools in the study were visited by researchers with no previous contact nor schedule. Several teachers at convenience basis in this stage were observed in the classroom to see their uses of IBs and Tablet PCs with permission of teachers and the school administrations.

Following the first stage, researchers carried out semi-structured interviews with those observed teachers immediately after the class.

The data come from a questionnaire developed for the whole pilot study by 20 researchers from colleges of education during the third stage of the data collection process. Questionnaires include items about participants' demographic information, and participants' use of IB and Tablet PC technologies and their attitudes, thoughts and perspectives about technology use in general.

In the last stage of the process, researchers held semi-structured focus group meetings in each city (a total of four meetings) with 44 teachers (24 men,

20 women) and 75 students (40 boys, 35 girls). One school in each city was hosted the meetings to which equal number of teachers and students from each school were invited. Among those participating teachers, researchers purposively invited teachers from different subject areas (i.e., 1 math teacher, 1 social studies and so on).

The collected data were analyzed with descriptive statistics techniques for quantitative data and content analysis for the qualitative data. Thus, the questionnaire results were provided in response frequencies and percentages. Statistical Package for Social Sciences (SPSS) version 17 was used to analyze questionnaire data. The qualitative data were analyzed with thematic approach developed based on the research questions (Kuş-Saillard, 2009).

### Results

The findings of the study were grouped into three main categories, as follows:

### The Use and Purpose of Interactive Board and Tablet PC

According to the results, the majority of the participating teachers and students were positive in general about the having access to IBs in their schools and classrooms. Although it was the first semester of the pilot and they had faced with several technical and some other problems, both the teachers and students clearly stated that they use IBs in the classroom for different purposes at various times as much as possible. While teachers insisted on the value of having access to IBs in the classroom and being able to use them for teaching, it was observed that the vast majority of those teachers perceive IBs as "Internet-Supported Projection Device" and, for this reason; their use of those technologies in the classroom were mostly limited with demonstrating the lecture presentations they had prepared. Among use of IBs, it was obvious for researchers that IBs were mostly used by the teachers more actively in the courses such as Biology, Geometry, Geography, and English Language than any other courses.

With regard to issues and problems about the use of IBs in the classroom setting, several problems and issues were determined. Among those; teachers strongly stressed on the limited access to e-content and e-materials developed specifically for the content area. In some cases, teachers had no single material to use in his or her classroom teaching.

Another crucial issue expressed by the teachers about the use of IBs was the lack of interactivity between IBs and students' Tablet PCs. Teachers pointed out that lack of interactivity between those technologies creates an environment in which students are in passive mode and almost impossible to engage them with the content. Although this issue seems to be a technical barrier at the initial look, it was more about pedagogical and classroom management issue in given context. To involve students in the learning process and engage them with the content, teachers strongly emphasized that there must be a possibility of communicating students' Tablet PCs and teachers would be able to transfer the activities and materials on IBs to the students' Tablet PCs.

During the observations, it was discovered that students' use IBs for following teacher presentations or demonstrating their presentations in classroom. During the interviews with the students, they emphasized that one of the important factors for the effective use of IBs is the teacher, and the effectiveness would certainly depend on how well teachers can use these technologies.

With regard to use of Table PCs, 72% of the teachers indicated that they mostly used Tablet PCs for accessing e-school applications and e-books provided on project website while 88% of the students stated that they mostly used them to reach e-books. In spite of the fact that given percentages of Tablet PC's use among teachers and students are considerable high, the interviews and classroom observations revealed that it was not the real case in the field. In other words, the uses of Tablet PCs, especially among teachers, were very low. During the classroom observations, it was noticed that almost none of the teachers used Tablet PCs in their teaching activities. As presented in details in the problems section of this study, technical problems, limitations and limited e-materials for Tablet PCs were major reasons for this issue.

### The Impact of IB and Tablet PC on Teaching and Learning

Responses gathered from the participant via questionnaires were grouped into three sub-categories: (1) Interest and motivation, (2) Teaching and learning process and (3) Social impact.

Based on the questionnaire data, it would be concluded that teachers' interest and motivation toward technology use in classroom was increased with the project. Teachers seem to have an expectation or developed a belief that given

technologies would contribute to teaching and learning process in a positive manner. Based on the data obtained from the field, it was clearly observed that teachers' had developed positive attitude toward use of IBs in the classroom.

In the field studies, it is revealed that the continuous use of IB from the beginning to the end of the lesson is not possible, and the other existing resources (enriched e-books, Tablet etc.) should be used together. During the interviews, the teachers using IBs underlined that they teach lesson topics more effectively as long as they do not have a technical problem during the lesson.

With respect to the effect of the use of Tablet PCs, it was found that although teachers' and students' expectations from Tablet PCs were very high in the beginning of the project, their interests and expectations much reduced over time (about in 3 months). During the classroom observations, it was observed that some students did not use Tablet PCs appropriate with the aim of lessons. Tablet PCs were perceived as a tool that distracts some students from the lesson, and thus several teachers did not allow students to use Tablet PCs while she or he was teaching. Although students were not allowed to install any applications on Tablet PCs, they found ways to unlock protection and install games and other software applications.

## The Problems/limitations Encountered during the Use of IB and Tablet PC

Sensitivity problem of the touch screen and the lack of pen tool were underlined by both teachers and students as an important technical problem/limitation with regard to use of IBs. In addition, the limitation of data transfer from portable devices (memory etc.) into Tablet PCs, the loss of lecture notes saved on Tablet PCs because of automatic software updates and the limited access to internet connection at home and at other places were mostly cited issues. Lack of e-materials was also highly noted limitation in the project during the study as mentioned before.

In terms of pedagogical problems encountered during the use of Tablet PCs, teachers' anxiety of difficulty in classroom management, teachers' lack of technical knowledge and limited understanding of how to use technology in teaching, limited number of materials that meets teachers' teaching preferences, the idea of increase in their workloads, and a sharp decrease in students' attention during the lesson were major issues.

## Discussions and Conclusion

The discussions based on the results of the study are grouped into three major categories as follows.

### The Usage

IB, which was provided in the context of the Project, was readily adopted by students and teachers and was used for a variety of purposes at different levels. However, it is not possible to say that for the Table PC, which was used by a limited number of students and almost by none of the teachers.

It was stated in the related literature that IBs are a kind of educational tools used not only for different in-class applications but also for enrichment of classroom environment and for having a more interactive teaching process (Jang & Tsai, 2012; Gillen, Littleton, Twiner, Staarman, & Mercer, 2008; Schmid, 2008; Smith, Higgins, Wall, & Miller, 2005). In the current study, even though teachers stated that they use the IB for enriching the in-class teaching and learning, it was observed that teachers mostly utilized this educational tool in order to show their presentations and course materials on the screen. Therefore, it was found that teachers generally perceived and employed this educational technology as "the internet-supported projector." Among the reasons for such a use could be being in the early phase of the pilot test for the project, teachers being still in the progress of in-service training regarding how to use this educational tool; teachers with lack of experience regarding the integration of technology into teaching and learning process; and teachers' resistance to change in their teaching strategies and methods to utilize this educational technology in an effective manner.

### Impact

It would be concluded that there is an obvious increase in the interests and attitudes of teachers and students towards the use and getting benefit of technology since the beginning of the project's pilot. One of the positive outcomes of the project is the increase of communication and collaboration especially in technical issues between teachers and students. With the integration of IBs into education, not all but most of the classrooms experienced a more joyful and audio-visual lessons as one of the most important constructive consequences of the project. However, it is hard to say so regarding the use of Table PCs in the classroom as there are some concerns about the negative impact of Tablet PCs in some cases.

There are variety of models regarding how to integrate technology into education to increase the quality and effectiveness of teaching and learning. As discussed in the literature review of the current study, the TPACK Model (Technological Pedagogical Content Knowledge) emphasize the idea that because the technology alone is insufficient to create such a desired impact, teachers need to take into account a kind of pedagogy that works best for the content of a particular lesson (Jimoyiannis, 2010; Mishra & Koehler, 2009; Usluel, Mumcu, & Demiraraslan, 2007). Consequently, in order to overcome the difficulties encountered in this study as well as to generate the desired output, teachers are needed to be trained and supported to use an instructional model within the pedagogical principles as discussed in the TPACK model.

According to another technology integration model, TAM (Technology Acceptance Model), the critical motivation for individuals to adopt and use technology, the technology should be user-friendly and should have observable results gained from the use of technology (Davis, 1989). Teachers should be trained about how to use the technologies provided to them within the context of the FATİH Project in addition to receiving technical and any kind of supportive services. However, the key issue for implementing the process appropriately is that the teachers and students must believe in the potential benefits of using Tablet PCs and IBs (Christensen, 2002; Hew & Brush, 2007; Jacobsen, Clifford, & Frieson, 2002; Kopcha, 2012; Pierson, 2001; Yildirim, 2007; Zhao, Pugh, Sheldon, & Byers, 2002). Therefore, there is a need for teachers and students who took part in the project to show what kinds of contribution the technologies provided for the sake of the project would make to them during the process of teaching and learning through the demonstration of exemplary studies and models.

**Issues and Problems**

The foremost issues that were encountered throughout the study are being not able to use the classroom management software, insufficient e-content and digital books, technical obstacles, and the lack of in-service training and inadequate technical support.

It has been seen in the previous studies that the rapid developments in information and communication technologies result in changes in our daily lives while producing concerns and fears in the process of utilization and adoption of those technologies

(Rogers, 1995; Savage, 2000; Sugar, Crawley, & Fine, 2004; Whetstone & Carr, 2001). According to Concerns-Based Adoption Model (CBAM) (Hall & Hord, 1987), it is difficult to decide what resources need to be used in the process of teaching and learning. Therefore, the concerns of teachers about the use of Tablet PCs stem from the lack of know-how regarding the use of those Tablet PCs.

Another issue is the insufficient e-content and inadequate digital textbook. When the related literature is reviewed (Ertmer, 2005; Ertmer et al., 2012; Hew & Brush, 2007; Project Tomorrow, 2011), it is seen that access to the educational resources is a vital factor in the integration of technology. In the light of the findings came out of this study, it is believed that the content provided with the technology affects the attitudes of teachers and students towards the use of technology in the process of teaching and learning.

It is found out that providing Tablet PCs to the teachers and students with a limited use of internet inside the school and a lack of internet connection outside the school diminishes the interest towards the use of these Tablet PCs. However, Johnson, Levine, Smith, and Stone (2010) point out in their report that accessing to online resources plays a key role in the progress of technology adoption.

As teachers reported, in-service teacher training programs specifically organized for this project were not effective as much as expected. Especially, the limited access to given technologies (IBs and Tablet PCs) during the training programs was a highly cited problem by the teachers.

In addition to this problem, the literature actually discusses different aspects of the teacher training programs and strongly advises that those programs need to move beyond traditional sense (technical skill training) toward more practical and pedagogical manner. According to several studies (Drexler, Baralt, & Dawson, 2008; Ertmer et al., 2012; Uslu & Bümen, 2012), an important factor resulting a failure in technology integration is ineffectiveness of in-service teacher training programs. As Pamuk (2012) suggested, the traditional in-service teacher training programs and approaches should be replaced with alternative approaches, which are more content, context and pedagogical based. .

Suggestions were drawn based on the findings of this study which aimed at the evaluation of the pilot test for the FATİH Project in four different provinces as the following. There is a need to:

- Enrich and diversify the e-content provided by EBA (Project's Content Database) as the priority,

- Enable teachers use the necessary software to be able to prepare appropriate content by themselves as compatible with the technologies provided,

- Update, as soon as possible, the teaching and learning programs in addition to the teacher handbooks as compatible with the use of information technology,

- Remove the technical obstacles based on the perspectives of stakeholders,

- Seek teacher views on preparing the content and using the internet filters,

- Have data exchange and communication between the IBs and Tablet PCs as well as to effectively use the classroom management software,

- Have the personnel and resources ready on site for technical and pedagogical support to the teachers,

- Organize in-service teacher training programs for teachers with different backgrounds (technological abilities, attitudes towards the integration of educational technology, age and subject areas),

- Provide in-service teacher training programs including technological and pedagogical aspects, which are offered by the pedagogical and technological experts on the subject matter,

- Constantly provide in-service training both face to face and on-line as well as to have certification based on the assessment and evaluation,

- Plan and conduct long-term studies about the effects of the educational technologies on student achievement,

- Decrease the number of students in classrooms to have a more effective use of technologies provided.

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