



Investigating the Effect of Technology Use in Education on Classroom Management within the Scope of the FATİH Project

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Abstract

This study aims to investigate the effect of technology use in education on classroom management within the scope of the FATİH project, which is a technology integration project. The present study utilizes the descriptive mixed method which involves both qualitative and quantitative methods. "The personal information survey", "The Effects of Technology Use on Classroom Management Scale" and "the semi-structured interview form" were developed by the researchers for data collection. The scale development study and preliminary applications were carried out before the actual application. The application was conducted in schools which actually used interactive board, tablet computer and software technologies within the framework of the FATİH Project. The study group was made up of 52 teachers serving in various provinces on the secondary education level. The content analysis method was used for analysis of the data obtained using the semi-structured interview form. Quantitative data were analyzed using frequency, percentage, Mann Whitney U and Kruskal Wallis H techniques on SPSS 18.0. According to the results obtained in the study, the average scores of intra-classroom relationship and behavior management sub-scale proportional to item count were higher compared to other sub-scales. Average scores obtained from the management of the classroom order and teaching sub-dimension were the lowest. The effect level of technology use by teachers in the classroom on classroom management was moderate. No statistically significant difference was found in terms of effect levels of technology use by teachers in the classroom on classroom management, except for the variable of daily internet use. Considering the results obtained from qualitative data, the perception that interactive board use in the classroom had positive effects on classroom management stood out. It can be said that this perception resulted from use of interactive board as a presentation tool during classes. In contrast, the teachers stated that tablet computer use in the classroom led to time management issues, negative student behaviors and certain interruptions during the class due to access problems.

FATİH Projesi Kapsamında Eğitimde Teknoloji Kullanımının Sınıf Yönetimi Üzerine Etkilerinin İncelenmesi

Makale Bilgisi

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Öz

Bu çalışmada bir teknoloji entegrasyon projesi olan FATİH Projesi kapsamında eğitimde teknoloji kullanımının sınıf yönetimine etkilerinin incelenmesi amaçlanmıştır. Araştırmanın yöntemi nitel ve nicel yöntemlerin bir arada kullanıldığı açıklayıcı karma araştırma yöntemidir. Veri toplamak amacıyla araştırmacılar tarafından "kişisel bilgi anketi", "Teknoloji Kullanımının Sınıf Yönetimine Etkileri Ölçeği" ve "yarı yapılandırılmış görüşme formu" geliştirilmiştir. Uygulama öncesi ölçek geliştirme çalışması yapılarak

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Anahtar Kelimeler:

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ön uygulamalar yapılmıştır. Uygulama FATİH Projesi çerçevesinde etkileşimli tahta, tablet bilgisayar ve v yazılım teknolojilerini fiili olarak kullanan okullarda gerçekleştirilmiştir. Araştırmanın çalışma grubunu, çeşitli illerde ortaöğretim düzeyinde görev yapan 52 öğretmen oluşturmaktadır. Yarı yapılandırılmış görüşme formu ile elde edilen veriler içerik analiz yöntemiyle analiz edilmiştir. Nicel veriler ise frekans, yüzde, Mann Whitney U ve Kruskal Wallis H tekniklerinden yararlanılarak SPSS 18.0 ile çözümlenmiştir. Araştırmada ulaşılan sonuçlara göre sınıf içi ilişki ve davranış yönetimi alt ölçeği madde sayılarına oranlı puan ortalamaları diğer ölçeklere göre daha yüksektir. Sınıfın düzeninin ve öğretimin yönetimi alt ölçeğinden elde edilen puan ortalamaları ise en düşüktür. Öğretmenlerin sınıfta teknoloji kullanımlarının sınıf yönetimine etki düzeyleri puanları orta düzeydedir. Öğretmenlerin sınıfta teknoloji kullanımlarının sınıf yönetimine etki düzeyi puanlarında günlük İnternet kullanım süresi değişkeni dışında diğer değişkenlere bağlı olarak istatistiksel açıdan anlamlı farklılık oluşmamıştır. Nitel verilerden elde edilen sonuçlar incelendiğinde sınıfta etkileşimli tahta kullanımının genel olarak sınıf yönetimi üzerinde olumlu etkilerinin olduğu algısı ön plana çıkmaktadır. Bu algının etkileşimli tahtanın genel itibarıyla derste sunu aracı olarak kullanılmasından kaynaklandığı söylenebilir. Bunun tersine öğretmenler sınıfta tablet bilgisayar kullandıklarında derste teknoloji kullanımının zaman yönetimi, olumsuz öğrenci davranışları ve yaşanan erişim problemleri nedenleriyle derste bazen yaşanan kopukluklar gibi sınıf yönetimi problemleri yaşadıklarını belirtmişlerdir.

Introduction

In the 21st century, the use of information technologies [IT] has become a necessity in many everyday tasks. In fact, technology is used in almost all everyday tasks (Muir-Herzig, 2004). The reflections of the intensive use of information technologies have made it necessary to make certain changes in the use of technology in education (Nam & Smith-Jackson 2007; Kim 2007). This process of change in the use of technology in education is carried out by the Ministry of National Education [MoNE] within the scope of the FATİH project.

The FATİH project aims to provide teachers and students in all schools from the secondary education level to primary education level with interactive boards, tablet computers and internet network infrastructure within the framework of integration of information technologies to classroom environment. Distance and face-to-face in-service trainings are held for teachers to ensure effective use of said technologies (MoNE, 2013).

The FATİH project consists of five main components. These are “the provision of hardware and software infrastructure”, “provision and management of e-content”, “effective IT use in teaching programs”, “in-service training for teachers to ensure effective IT use in classes” and “informed and secure IT use with network infrastructure and broadband internet use”. The component of “effective IT use in teaching programs” aims to ensure effective integration of IT tools into teaching programs (MoNE, 2012). As an important result of this, it is believed that considerable changes occur in classroom management in classes enriched with technology.

Use of technology in education is of great importance for both realization of effective learning-teaching processes and raising individuals possessing competences necessary for being a member of the 21st century society. There are many variables that affect the use of technology in education. These variables include educational institutions, infrastructure facilities, curriculum, student, teacher count, competences of students and teachers related to technology use, skills related to classroom management and technology use, sufficient in-service training for teachers and adequateness of technical support (Muir-Herzig, 2004; Yıldız, Saritepeci & Seferoğlu, 2013). Effective classroom management, one of these variables, is a substantial precondition for providing meaningful technology integration (Lim, Pek & Chai, 2005). On the other hand, it can be said that IT has also some effects on classroom management. Teaching and management processes in classrooms, which may be defined as an environment specific to the teacher and the learner, change shape and direction with the design of instructional technologies (Morrison, Ross & Kemp, 2013).

Teachers need to manage all resources in the classroom environment. Classroom management is one of the most important factors to increase the efficiency of education, ensure interaction, and reaching educational goals (Başar, 2003; Erdoğan, 2001; Lemlech, 1988). Classroom management is concerned with principles, concepts, theories, methods and techniques related to planning, organization, application and assessment processes to reach educational goals (Albayrak, 2014; Brophy, 1988). Classroom management seems to have multiple dimensions and may be addressed in five main dimensions; management of physical structure of the classroom, teaching management, time management, management of intra-classroom relationships, and behavior management (Başar, 2003; Sarıtaş, 2003). These five dimensions may be defined as follows according to Başar (2003):

Management of physical structure of the classroom involves ensuring the compatibility between the use of classroom tools and educational goals, and organizing factors related to the classroom environment. For this reason, to make learning process more productive, the physical structure should include motivating and interesting elements (Aydın, 1998) and allow learners to feel comfortable and peaceful (Varank & İlhan, 2013).

Teaching management is to plan teaching methods and principles in accordance with the environment to achieve educational goals through plans, programs and activities (Küçükahmet, 2001). This planning must have a structure that supports the flow of learning-teaching activities and student engagement (Celep, 2002).

Time management is to create a time plan for classroom activities. Efil (2003) described time management as to improve qualification of learning and teaching activities carried out in a limited period of time.

Management of intra-classroom relationships is to ensure communication between students to allow for effective teaching in the learning environment. The warm relationship established between teacher and students within the framework of respect and mutual trust has critical importance to provide a positive classroom climate (Marzano, Marzano & Pickering, 2003; Sabancı, Özyıldırım & İmsir, 2014). Regarding this situation, Emmer and Stough (2001) emphasized to create positive relationships between teacher and students an important element for classroom management.

Behavior management is the organization of the classroom environment in a way that negative behaviors in the classroom atmosphere are prevented (Başar, 2003). The observed undesirable student behaviors generally can obstruct that it from being continued the learning-teaching process as healthy way (Çubukçu & Girmen, 2008). This situation can affect classroom management negatively. In this context, it is required that teachers control negative student behaviours in scope of class rules for an efficient classroom management (Erol, 2006).

The focus and Importance of the Study

It may be predicted that the structure and roles of classroom management will change as a result of changing classroom structure and interaction types due to integration of technology in education. For example, technical issues experienced in using IT in class can cause disruptions in course and that can also lead to the formation of negative student behaviors (Lim et al., 2005). However, little research exists (Bolick & Bartels, 2014; Sabancı, Özyıldırım & İmsir, 2014; Uçar, 2017) in the literature investigating the existence and nature of changes in tools used by teachers in classrooms enriched with technology, reactions of teachers to positive and negative behaviors in the classroom environment, feedbacks given by teachers, methods and techniques used by teachers, time planning in the learning-teaching process, time allocated by teachers for each student and course engagement. In this context, this study focuses on addressing the effect of the use of technologies provided within the scope of the FATİH project on classroom management processes and revealing perceptions of teachers on the subject.

Purpose

This study aims to investigate the effect of technology use in education on classroom management within the scope of the FATİH project, which is a technology integration project. To this end, the following sub-problems were identified:

- How are scores related to effects of technology use by teachers on classroom management distributed?
- Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on different variables?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on gender?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on age?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on seniority?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on experience in computer use?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on experience in internet use?
 - Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on daily internet use?
- What are teacher opinions related to effects of technology integration within the scope of FATİH Project on classroom management?

Method

The descriptive mixed method, which involves both qualitative and quantitative methods, was used in the study. The mixed approach allows for reaching more participants with its quantitative aspect and addressing the subject in-depth with its qualitative aspect (Yıldırım & Şimşek, 2006). The most important reason for the choice of a mixed method is that it provides depth information relatively about the effects technology using in education on classroom management. Another important reason is that number of participants is limited in this study.

Study Group and Characteristics

The study was carried out in the Spring semester of 2015-2016 academic year with 52 teachers who taught in various schools on the secondary education level and used various technologies within the framework of the FATİH project.

Table 1.
Distributions on the Demographic Characteristics of Teachers

Variables	Options	f	%
Gender	Female	35	67.3
	Male	17	32.7
Age	20-30	8	15.4
	31-40	22	42.3
	41 and above	22	42.3
Service Time	6-10 years	16	30.8

	11-15 years	10	19.2
	16-20 years	13	25.0
	21 years and above	13	25.0
Computer usage experience	4-6 years	12	23.1
	7-9 years	10	19.2
	10 years and above	30	57.7
Internet usage experience	4-6 years	12	23.1
	7-9 years	10	19.2
	10 years and above	30	57.7
Daily Internet usage time	Less than 1 hour	26	50.0
	2-4 hours	20	38.5
	5-7 hours	6	11.5

The study was conducted with teachers working in two high schools that can relatively easier accessible by researchers. In this context, 52 of the 107 teachers who responded to the data collection tool participated in this study. As shown in Table 1, 67.36% of the participants were female and 32.7% were male. The participants were mostly in the 31-40 (42.3%) and 41 and above (42.3%) age group and had 6-10 years (30.8%) of seniority. More than half of the participants (57.7%) had 10 years of experience or more in computer and internet use. 50% of the teachers reported a daily internet use less than 1 hour, which was a higher percentage than the other groups.

Data Collection Tools

“The Personal Information Form” was used in the study to reveal demographic characteristics of the study group and “The Effects of Technology Use on Classroom Management Scale” was applied to the teachers from different branches to investigate the effects of interactive board and tablet computer use on classroom management and lectures. In addition, a structured interview form included 6 open-ended questions prepared by researchers was used. Data collection tools were applied to the study group by researchers both online and face-to-face.

The personal information form was applied with the aim of obtaining information related to demographic characteristics of the participants such as gender, age, seniority and use of information technologies.

The Effects of Technology Use on Classroom Management Scale was developed to determine effects of technology use on classroom management.

The study followed four main steps. The first three steps involved studies for the development of “The Effects of Technology Use on Classroom Management Scale”. The last step involved the actual application for data collection. In the first step, three sub-dimensions related to effects of technology use on classroom management were determined using factors defined by Albayrak (2014), Başar (2003) and Sarıtaş (2003) in relation to traditional classroom management in the literature. A question pool was created in accordance with these sub-dimensions and opinions of three experts were received. Based on the data obtained from the experts, 4 items were removed from the 17-item scale and a draft scale was created. In the second step, the scale was applied to a sample consisting of 99 teachers, who were excluded from the actual application, and the results were analyzed with exploratory factor analysis. 4 items were removed due to factor loadings. Confirmatory factor analysis was performed for the resulting data and the 9-item scale was obtained. Exploratory and confirmatory factor analyses were performed on the 9 remaining items and the results were examined. In the last step, the scale was actually applied.

Factor analysis was performed to test the validity and reliability of the scale. The data collection tool was developed by the researchers. The data collection total consists of 3 sub-dimensions and 9 items.

Items 1, 3, 4, 6 and 9 involve negative statements and are reversely scored. During analysis, the original grading (1-Strongly Disagree / 5-Strongly Agree) was reversed (1-Strongly Agree / 5-Strongly Disagree). The fitness of the data for exploratory factor analysis was determined based on Kaiser- Meyer- Olkin (KMO) coefficient and Bartlett Sphericity test results (See Table 2).

Table 2.
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Sample Group Compliance		.764
Bartlett's Test	χ^2	322.308
	df	36
	p	.000

The data set is deemed fit for factor analysis when the KMO coefficient is higher than .60 and the Bartlett's test is significant (Büyüköztürk, 2009). The pilot application of the scale for validity testing showed that the fit of the data for the sample was on the level of 0.001, the KMO coefficient was .764 and the significance value of the Bartlett's test was .000, which indicates that the data were fit for factor analysis.

Examining "Component matrix" item factor loading values in the factor analysis and assuming .32 for loading values, the items were observed to meet this acceptance level. The ETUCM scale has 3 factors. The first factor explains 26.731% of the total variance, the second factor explains 26.420% of the total variance and the factor explains 16.815% of the total variance. Thus, three factors explain 69.967% of the total variance. In this context, three factors which were found to be important in the analysis seem to explain the majority of total variance in the items and total variance in the scale. Cronbach's Alpha reliability coefficient of the entire scale was found to be 0.926. We can say that this is a high value.

The model identified according to the results of the exploratory factor analysis was tested with confirmatory factor analysis (CFA). The LISREL 8.7 software was used for the analysis. There are a large number of fitness indices used in CFA to assess the validity of the model. The most frequently used indices include the Chi-square Fitness Test, the Goodness of Fit Index (GFI), Corrected Goodness of Fit Index (AGFI), Standardized Root-Mean-Square Residual (S-RMSR) and Root Mean Square Error of Approximation (RMSEA). In the literature, a rate less than 5 calculated with CFA (χ^2/df) indicates a good fitness between the model and the actual data (Sümer, 2000, as cited in Büyüköztürk, 2009). GFI and AGFI values are expected to be over .90 for model-data fitness. Another measure to assess the model-data fitness is the RMSEA value. In RMSEA, a value equal to or smaller than 0.05 indicates excellent model-data fitness, a value between 0.08 and 0.10 indicates acceptable model-data fitness and a value over 0.10 indicates poor model-data fitness (Hayduk, 1987).

In this study, the Chi-square statistic, which is the only measure with a statistical foundation among goodness of fit tests indicating the model-data fitness in confirmatory factor analysis, was found to be significant ($p=.000$). The RMSEA value was found to be 0.076. We can say that the fitness between the model and the data was acceptable since the RMSEA value was calculated to be 0.076. On the other hand, a GFI value over 0.85, an AGFI value over 0.80 and a RMS value below 0.10 are accepted as measures of fitness between the model and the actual data (Marsh, Balla & McDonald, 1988, as cited in Büyüköztürk, 2009). The standard chi-square value obtained by dividing the chi-square value by the degree of freedom was over 5. Considering the chi-square statistic, it can be said that the model and the data did not have a good fitness. However, the chi-square statistic is extremely sensitive to sample size. It is necessary to determine whether this result was obtained due to the small sample size or due to the lack of fitness between the model and the data using other fitness statistics. For this reason; GFI, AGFI, NNFI, S-RMSR, IFI and CFI values were examined for determination of the model-data fitness. It was found that the GFI value was 0.89, the AGFI value was 0.79, the NNFI value was 0.89, the S-RMR value was 0.050, the IFI value was 0.96 and the CFI value was 0.96. There is a good fitness between the model

and the data when these values are close to 1.0. Considering these criteria, it is seen that there is an excellent fitness between the data and the research model, which was created in order to examine relationships between the ETUCM scale and factors affecting it (Hair. 1995, as cited in Yılmaz, 2004).

Data Analysis and Interpretation

The data were analyzed using frequency, percentage and logistic regression techniques depending on the research problem in SPSS 18.0. The significance level was accepted to be 0.05. The teachers were coded as T1, T2 ... T52 when presenting their opinions.

For the qualitative data, the dimensions defined in the literature were used and coding was performed based on previously identified categories. A total of 17 codes were created under 5 categories. The reliability of the coding process was determined by testing the intercoder reliability. Two coders coded 15% of the data together. They coded the remaining data separately. The intercoder reliability was determined by two coders agreed divided by the sum of two coders agreed and two coders disagreed (Miles & Huberman, 2015). The intercoder reliability was found to be 82% with this formula. Accordingly, it can be said that there was a high level of agreement between the coders.

The dependent variable did not show normal distribution. The data collected were analyzed using arithmetic mean, standard deviation, Mann Whitney U and Kruskal Wallis H techniques on SPSS. When interpreting scale scores; below 2 was accepted as very low, 2-2.75 was accepted as low, 2.75-3.5 was accepted as moderate, 3.5-4.25 was accepted as high and 4.25-5 was accepted as high.

Findings

The findings were presented in the same order as the questions posed for the study in the form of answers to them.

3.1. The Distribution of Scores Related to Effects of Technology Use by Teachers on Classroom Management

The first sub-problem of the study was “How are scores related to effects of technology use by teachers on classroom management distributed?” Analysis results are shown in Table 3.

Table 3.
The Effect Level of Technology Use in Classroom on Classroom Management

Subscales	$\bar{X}$	SS	$\bar{X} / k$	Min	Max
The Effects of Technology Use on Classroom Management Scale [ETUCM]	30.46	6.05	3.38	21.00	45.00
<i>The management of the layout of the classroom and teaching</i>	9.56	2.34	3.18	5.00	15.00
<i>Time management</i>	10.36	2.38	3.45	6.00	15.00
<i>Interclass relationship and behavior management</i>	10.53	2.13	3.51	7.00	15.00

As shown in Table 3, the average scores of intra-classroom relationship and behavior management sub-scale proportional to item count were higher compared to other sub-scales. Average scores obtained from the management of the classroom order and teaching sub-dimension were the lowest. According to average scores obtained in the scale, the effect level of technology use by teachers in the classroom on classroom management seems to be moderate.

3.2. Effect Levels of Technology Use by Teachers in the Classroom on Classroom Management Depending on Different Variables

The second sub-problem of the study was “Do effect levels of technology use by teachers in the classroom on classroom management show a significant difference depending on different variables?” Mann Whitney U and Kruskal Wallis H analyses were performed to answer this sub-problem.

Table 4 shows the distribution of scores depending on gender, Table 5 shows the distribution of scores depending on age, Table 6 shows the distribution of scores depending on seniority, Table 7 shows the distribution of scores depending on experience in computer use, Table 8 shows the distribution of scores depending on experience in internet use and Table 9 shows the distribution of scores depending on daily internet use.

Table 4.
Mann Whitney U Test Result Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management by Gender

Scale	Gender	Rank averages	U	p
ETUCM	Female	26.44	295.50	.969
	Male	26.62		

Table 4 shows that the mean rank (26.44) related to the effect of use of technology by male teachers on classroom management was higher compared to mean rank (26.44) of female teachers. Although there was difference in favor of male participants between mean ranks, this difference was not statistically significant ($U = 295.50$, $p \geq .05$). Thus, it can be said that perceptions of the participants related to effects of technology use in teaching-learning processes on classroom management depending on age were similar.

Table 5.
Kruskal Wallis H Test Results Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management According to Age

Scale	Age	Rank averages	df	χ^2	p
ETUCM	20-30	17.13	2	5.45	.065
	31-40	25.18			
	41 and above	31.23			

Table 5 shows that the 41 and above age group had the highest mean rank (31.23) related to the effect of use of technology by teachers on classroom management depending on the age variable. The lowest mean rank belonged to the 20-30 age group (17.13). This difference between mean ranks depending on age was not statistically significant ($\chi^2(2) = 5.45$, $p \geq .05$). Thus, it can be said that the age variable had a similar structure in terms of the effect of technology use in classroom processes on classroom management.

Table 6.
Kruskal Wallis H Test Result Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management According to Service Time

Scale	Service Time	Rank averages	df	χ^2	p
ETUCM	6-10 years	23.59	3	3.90	.272
	11-15 years	29.30			
	16-20 years	22.19			
	21 and above	32.23			

As shown in Table 6, no statistically significant difference was found in terms of effect levels of technology use by teachers in the classroom on classroom management depending on seniority ($\chi^2(3)=3.90$, $p \geq .05$). Although there was no significant difference, the teachers with 21 years or above seniority had the highest mean rank, followed by the teachers with 11-15 years of seniority.

Table 7.

Kruskal Wallis H Test Results Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management According to Computer Usage Experience

Scale	Computer usage experience	Rank averages	df	χ^2	p
ETUCM	4-6 years	34.29	2	4.19	.123
	7-9 years	24.05			
	10 years and above	24.20			

The data given in Table 7 shows that although the mean rank of the participants with 4-6 years of experience in computer use (34.29) was higher than the other groups, the difference was not statistically significant ($\chi^2(2)=4.19$, $p \geq .05$). Thus, it can be said that the distribution of effect levels of technology use in the classroom on classroom management depending on experience in computer use had a similar structure.

Table 8.

Kruskal Wallis H Test Results Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management According to Internet Usage Experience

Scale	Internet usage experience	Rank averages	df	χ^2	p
ETUCM	4-6 years	34.29	2	4.19	.123
	7-9 years	24.05			
	10 years and above	24.20			

As shown in Table 8, no statistically significant difference was found in terms of effect levels of technology use by teachers in the classroom on classroom management depending on experience in internet use ($\chi^2(2)=4.19$, $p \geq .05$). Although there was no significant difference, the teachers with 4-6 years of experience in internet use had the highest mean rank, followed by the teachers with 10 years of experience or more in internet use.

Table 9.

Kruskal Wallis H Test Results Regarding the Distribution of the Impact Level of Teachers' Use of Technology on Classroom Management According to Daily Internet Usage Time

Ölçek	Daily Internet usage time	Rank averages	df	χ^2	p
ETUCM	Less than 1 hour	26.27	2	.23	.019
	2-4 hours	25.98			
	5-7 hours	29.25			

As shown in Table 9, a statistically significant difference was found in terms of effect levels of technology use by teachers in the classroom on classroom management depending on daily internet use ($\chi^2(2)=.23$, $p < .05$). Considering mean ranks, the teachers with 5-7 hours of daily internet use had the highest classroom management effect level scores, followed by the teachers with less than 1 hour of internet use.

3.3. Teacher Opinions Related to Effects of Technology Integration within the Scope of FATİH Project on Classroom Management

The third sub-problem of the study was “How has classroom management changed with the integration of technology within the scope of FATİH Project?” The frequency distribution related to this sub-problem can be seen in Table 10.

Table 10.

Categories and Themes Related to the Effects of Technology Integration on Classroom Management According to Teachers Opinions

Categories	Themes	Frequency of occurrence
Management in terms of technology	Teacher's skill of using technology	9
	Teachers' beliefs about the use of technology	5
	In-service training inadequacies	4
	Awareness about the usefulness sourced from experience	4
Management of Teaching	Motivation (+/-)	5
	Time constraint to achieve goals	4
	Effectiveness/attractiveness	4
	Curriculum /Content density	2
	Lack of e-content	2
	Use of uniform methods	2
Time Management	Inadequacy use of technology	8
	Technical problems	6
	Convenience in practice	6
Interclass relationship and behavior management	Negative impact on teacher leadership	2
	Reduce face-to-face communication	1
Behavioral Management	Interest in extracurricular activities	4
	Problems of courses focus	3

In the categorization based on teacher opinions shown in Table 10, “Management with Regard to Technology”, the management of available tools by teachers with regard to technology use in the classroom, seems to be the most important category. On this subject, teachers stated that competences and awareness of teachers related to technology use were effective on classroom management. Some teacher opinions related to this subject are as follows:

In the categorization based on teacher opinions shown in Table 10, “Management with Regard to Technology”, the management of available tools by teachers with regard to technology use in the classroom, seems to be the most important category. On this subject, teachers stated that competences and awareness of teachers related to technology use were effective on classroom management. Some teacher opinions related to this subject are as follows:

I have acquired a general knowledge about technology use in trainings and it helped a little with technology use in the classroom. I believe that my skills will improve as I practice.(T5)

I believe I have become more informed thanks to trainings. However, I am not sure about technology use and its benefits. (T8)

We performed an activity with the tablet in a class which I do not normally teach. What I have learned during the activity will be useful in future.(T15)

I would be better if in-service trainings were not so theoretical, but more practical. I do not think that an application related to tablet use in the classroom is not sufficient on its own.(T25)

Another important category was time management. The use of technology in the classroom was observed to negatively affect teachers most of the time. Teacher opinions on this subject are given below.

Technology use mostly turns out to be an obstacle. Students sometimes use the tablet during the class for unbelievable purposes. For example, an internet cafe in the district installed some games on the tablets given to students. Some students say “We are playing Counter Strike” during the class. However, the smart board is useful when used effectively.(T1)

There may be some issues related to time management at first, but I believe that it will be useful.I believe that it will allow for more effective lectures. (T14)

Technology use takes some time. (T16)

We experienced issues with internet connection of the tablet given to computer lab teachers for classroom use. We had to perform the tablet activity on another day.

I think tablet use is a matter full of problems. Some students do not have a tablet due to reasons such as being transferred from some other school and losing or breaking their tablets. Also, internet connection gets lost from time to time as we have experienced during classroom activities and it prevents us from doing what we want to do. (T20)

The biggest advantage is that I do not write questions on the board anymore. I present questions on the interactive board. Students find the opportunity to learn solutions of a wider variety of questions. (T22)

It allows for making adjustments specific to students with individual differences, attracts the interest of students and allows for more efficient use of time, which I think are the most important advantages.(T24)

The category of management of teaching points out the role of technology use in the relationship between use of technology by teachers and achieving educational goals. The following are some substantial teacher opinions:

It makes the course more interesting because it adds a visual aspect to the course. (T34)

All students were given a tablet, but most students say that it is broken. I believe that we will experience certain problems with tablets. The interactive board saves time and makes the course more interesting because it allows for using prepared colors. (T5)

A well-prepared course attracts the attention of all students, but having written notes allows them to feel safer when studying.(T6)

I do not use a tablet. I use the smart board for presentations. (T18)

The class duration and the intensity of the content may cause problems.(T27)

The advantages are far greater than disadvantages. It is very useful to monitor students. The disadvantage is related to the interest of the student in the class.(T27)

Teacher opinions related to management of intra-classroom relationships are as follows:

It contributes greatly to the course. All students participate in activities. Some students become disengaged from the activity due to technical issues. Students believe that they have more freedom. This matter is perceived to be simple by students.(T3)

Results and Discussions

In this study, it is aimed to investigate the effects of the technology use in education on classroom management in different perspectives according to teacher opinions and various variables (gender, age, seniority, experience in computer use, experience in internet use, daily internet use) within the scope of FATİH Project which is a technology integration project.

Whilst a high score obtained from the scale used to determine effects of technology use by teachers in the classroom on classroom management indicates that effects of technology use on classroom management are positive, a low score obtained from the scale indicates that effects of technology use on classroom management are negative. Certain results were obtained in accordance with findings in this study conducted to investigate effect of technology use by teachers on classroom management depending on certain variables.

According to the results obtained in the study, the average scores of intra-classroom relationship and behavior management sub-scale proportional to item count were higher compared to other sub-scales. Average scores obtained from the management of the classroom order and teaching sub-dimension were the lowest. The effect level of technology use by teachers in the classroom on classroom management was moderate. It was found that effects of technology use by teachers on classroom management varied significantly depending on the variable of “daily internet use”. No statistically significant difference was found depending on variables other than daily internet use.

The effect level of technology use by male teachers on classroom management was found to be higher compared to female teachers. Assessments made with respect to gender shows that technology use by male teachers in the classroom had more positive effects on classroom management. On the other hand, considering scores obtained in relation to the variable of age, the teachers in the 41 years and above age group were found to have the highest score. A similar situation was observed for the seniority variable as well. These two were the most noteworthy findings of the study. It is a common idea that younger teachers have higher IT skills and give more place to technology in teaching processes compared to older teachers (Usluel, Mumcu & Demiraslan, 2007). The expectation due to this common idea is that younger teachers obtain a higher score from the effects of technology use on classroom management scale. However, the opposite was observed in this study. The most important reasons behind this finding may be that older teachers have higher experience in classroom management and therefore experience fewer problems in relation to classroom management although they have a lower level of technological literacy. In support of this idea, it was found in the study conducted by Usluel, Mumcu and Demiraslan (2007) that the experience and knowledge level of the teacher related to classroom management was effective in dealing with problems encountered during efficient integration of technology in teaching-learning processes and use of technology in the classroom.

It was found that the positive effect of technology use on classroom management was higher among teachers with 4-6 years of experience in computer and internet use. Teachers 5-7 hours of daily internet use were found to have higher scores compared to other groups. The previous experience of teachers in computer and internet use can be said to influence scores obtained from the effects of technology use on classroom management scale. It can be said that teachers who use technology on a regular basis are more successful in ensuring integration of technology in the classroom (Gorder, 2008; Zhao, 2007). Thus, considering that the frequency of using IT tools affects the speed of finding a solution or number of problems experienced during the integration of technology, regular technology use can be said to

diminish classroom management problems encountered during the integration process. Various studies on the subject emphasize the necessity of having a sufficient level of IT literacy for teachers in order to ensure effective integration of technology into learning environments (Jedekog & Nissen, 2004; Usluel, Mumcu & Demiraslan, 2007).

In the categorization based on teacher opinions, “Management with Regard to Technology”, the management of available tools by teachers with regard to technology use in the classroom, seems to be the most important category. Considering teacher opinions in this category, it was found that the teachers needed more training to improve their skills related to information technologies in general. Also, the teachers mentioned the necessity of focusing more on practice in in-service trainings related to integration of technology. Although all of the teachers who participated in the study had received training within the scope of the FATİH project, it does not seem possible to say that these trainings managed to meet their needs. Usluel, Mumcu and Demiraslan (2007) noted in relation to this issue that although teachers receive in-service trainings on technology use in the classroom, it is necessary to question the quality of these in-service trainings due to differences between information given in trainings and applications in real life. Considering teacher opinions related to technology use in education in general, it seems that they mostly focused on interactive boards and tablets provided within the scope of the FATİH project. Teachers mostly expressed positive opinions related to use of interactive board in the classroom. According to teacher opinions, interactive board attracts the interest of students, allows for more efficient use of time and faster progress during classes. This opinion of the participants is consistent with Clark’s (1994) idea that technology use in education may have advantages in terms of cost, access and speed. However, Clark mentions the innovation effect in relation to remarkableness. The main reason why teachers do not experience problems with the use of interactive board in the classroom and have a high satisfaction level overall is the fact that the interactive board is usually used as a presentation tool (Albayrak, 2014; Dursun, Kuzu, Kurt, Güllüpınar & Gültekin, 2013). In relation to this subject, Chen (2008) noted that presentations are the most commonly preferred technological applications for transferring the course content to students, because learners/participants accept these more easily, which supports classroom management (Chen, 2008).

In contrast to positive opinions related to the use of interactive board, it seems that teachers have concerns related to existing or potential problems related to tablet use and its effects on classroom management. These problems include problems related to time management, students’ using tablets during classes for other purposes, access problems and some students’ not having tablets. Considering access problems, the teacher or the student may lose internet access or access to the virtual classroom created using the interactive classroom management software. A certain amount of time must be spent to regain access. It is a serious difficulty to ensure students focus their attention on the lecture and make up for the time lost while regaining access. In such cases, access emerges as an important classroom management problem. Related to *students’ using tablets during classes for other purposes*, which is another possible classroom management problem, it has been determined that students use tablets in class as games and multimedia playing tools, which is a situation that can lead to classroom management problems (İsci & Demir, 2015; Saritepeci & Durak, 2016).

It may be useful to allow all smart devices to access the virtual classroom created using the “Interactive Classroom Management Software” (MoNE, 2015) developed for efficient use of tablet computers to reduce existing or potential problems encountered in relation to classroom management. Thus, in case of technical, hardware-related or access problem encountered due to the tablet computer, the student may continue participating in the class using a different smart device (smartphone, computer, personal tablet computer, etc.). In this way, it may be possible to overcome difficult situations arising due to students’ breaking or losing their tablets, which were mentioned by the teachers as well.

According to results of this study, teachers emphasized level of IT literacy as the most significant element of classroom management in technology assisted courses. In this framework, qualified in-

service training can be provided to develop IT literacy of teachers. Together with these trainings, in future studies it can conduct studies examining changes in teachers' views on the effects of IT use on classroom management.

In this study investigating effects of technology use in teaching-learning processes on classroom management, type of technology use in the classroom was addressed as a variable. It is recommended that further studies are conducted on how and to what degree the type of technology use in classroom processes affects classroom management.

This study was conducted with the participation of teachers from various branches serving on the secondary education level in order to investigate various effects of technology use in the classroom on classroom management depending different variables and in accordance with teacher opinions. Investigating effects of technology integration in teaching-learning processes on classroom management at different K-12 levels (elementary school, middle school, high school) in future studies will greatly contribute to the literature.

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