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New Barriers to Technology Integration [1, 2]

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ABSTRACT

Purpose of the Study: Although there are many reasons to use technology in the classroom (to enhance student achievement, motivation, and process productivity; diversity offers teachers new alternatives for instruction and supports self-learning), various barriers hinder technology integration. Technology integration in the education field is a multidimensional process, and its success depends on many variables. Therefore, it is necessary to re-examine the barriers under several changing conditions (the improvement of infrastructure possibilities, professional development activities, etc.). This study discusses the problems related to the integration of a newly introduced web system with educational activities, "Tracking and Evaluation System for Book Reading Activities" (KITaS), that would be included in a public school system, in addition to the integration of teachers in the course of promoting and implementing it in Kırklareli. In the process of implementing KITaS, the aim was to determine the barriers present, which were based on teachers' considerations of barriers regarding the integration process. The profiles of the changing barriers in the literature were compared. **Research Method:** In this qualitative research conducted during the 2015–2016 school term, data were collected through observations, interviews, and open-ended question forms. The research participants were seven teachers from a government secondary school in Kırklareli. **Results:** The primary findings of this research are as follows: (A) there is a need to accept that there are always some barriers to technology integration; (B) it is believed that the administrative unit of an institution where teachers work decides whether to engage in the process of technology integration, and (C) there is not a need to integrate technology in test-centered approaches, which focus on students' success on exams. **Implications for Research and Practice:** Within the scope of this research, the barriers similar to those in the literature are established, in addition to an additional barrier that does not directly correspond to those in the literature. Depending on the changing conditions, it seems that new barriers to technology integration (believing that the top unit of an institution at which teachers work decides whether to engage in the process of technology integration, and accepting that there are several barriers to technology integration at all times) emerge and other barriers (lack of technology resources) are found to decrease.

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Introduction

There are many reasons to use technology as an educational tool. Pedagogically, technology has been attracting much attention as a valuable element for enhancing student achievement, motivation, and process productivity (Roblyer & Doering, 2010). In addition to its benefits for students, teachers have also been found to increase their skills regarding the use of technology and its contributions to their expertise in their fields (Cennamo, Ross, & Ertmer, 2010; Minor, Losike-Sedimo, Reglin, & Royster, 2013; Xu & Pershing, 2010). In addition to these benefits, diversity offers teachers new alternatives for teaching methods and techniques, providing them with opportunities to act out their roles in teaching (Cennamo, Ross, & Ertmer, 2010, Matzen & Edmund, 2007). A continuing set of limitations is also mentioned because the integration of technology education depends on different dimensions, sources, and variables (Inan & Lowther, 2010; Mazman & Koçak Usluel, 2011).

Kaya and Koçak Usluel (2011) stated that barriers to the integration of technology could be overcome by working on infrastructure, tools, pedagogical beliefs, self-efficacy, skills, ICT use, innovation, and professional development. In the literature, various teachers have been found to avoid using technology because their knowledge about its integration is very limited (Koçak Usluel & Demiraslan, 2005). Others avoid technology in an attitudinal way, although the necessary technical infrastructure is provided and their access to it is possible. In addition, Becker (2000) argued that teachers and students must be able to access technological resources without any problems in order for technology to be effective in education. In other words, the technological infrastructure of the schools and access to this technology are crucial elements in the integration process (Bingimlas, 2009; Vanderlinde & Van Braak, 2010). Ertmer (1999) defined technology integration barriers as "*first order (external barriers),*" referring to those stemming from external causes, such as a lack of adequate infrastructure and relevant knowledge, and "*second order (internal barriers),*" meaning those stemming from individuals' attitudes and beliefs. Along with these barriers, teachers' lack of design-thinking skills has also been discussed as the third order (Tsai & Chai, 2012). How teachers perceive instructional practices is closely related to how they understand teaching (Kember, 2009; Prosser & Trigwell, 1999). At this point, it is impossible to ignore some of the internal or external barriers. As the integration of education is a multidimensional process and its success depends on many variables, it is necessary to re-examine these barriers under several changing conditions (improving infrastructure possibilities, professional development activities, etc.).

Purpose of the Study

This study discussed problems related to the integration of a newly introduced web system with educational activities that would be included in a public school system and the integration of teachers in a course to introduce and implement it in Kırklareli. This web system is called the "Tracking and Evaluation System for Book Reading Activities" (KITaS) and enables the online evaluation of secondary school students' book-reading activities. In the process of applying this new system, the aim was to determine the challenges present based on teachers' barriers regarding the integration process, and the profiles of changing barriers in the literature were compared.

In this regard, the research questions were designed as follows:

- What barriers are faced by teachers in integrating KITaS into their teaching activities?
- What other barriers do teachers experience in this process differently from the relevant literature?

Literature Review

When studies conducted in the field regarding barriers to technology integration are investigated, it is revealed that various general issues must be managed. Within the realm of this study, deficiencies in knowledge and skills regarding teachers' efficient use of technology and opportunities to access technology highlight the primary and secondary barriers to the integration of technology. When recent studies are examined, the relationships among these barriers can be observed (e.g., Hur, Shannon, & Wolf, 2016). In addition, Tsai and Chai (2012) pointed out that external and internal barriers as well as the barriers stemming from deficits in teachers' design-thinking skills in relation to technology for adapting various contexts, groups, and instructional needs can be considered a third barrier. In other words, it is necessary to prepare courses, content, methods, and approaches as a whole for technology integration in the relevant process.

As the importance of technology integration (TI) in educational activities is frequently mentioned, it is seen that units or teachers focus on what kinds of problems are involved in the process and how these can be overcome. These limitations have been categorized in a number of studies and gathered under certain headings. The common features of the limiting conditions collected under each heading have been examined in an attempt to overcome them. However, researchers have stated that various restrictive conditions have started to change (e.g., Ertmer et al., 2012). The barriers that stand out in this regard are as follows: limited access to technology (Clark, 2006; Hew & Brush, 2007); crowded classrooms; deficiencies in both hardware and software (Çakır & Yıldırım, 2009); insufficient time in classrooms where technology has been integrated; negative attitudes of teachers toward technology (Hermans, Tondeur, Valcke, & Van Braak, 2006); low levels of knowledge regarding technology (Bauer & Kenton, 2005; Çakır & Yıldırım, 2009); not believing that technology plays a useful role in education (Ertmer et al., 2012; Hur, Shannon, & Wolf, 2016); being unaware of the contributions related to using technology in the classroom (Chen, 2008); lack of management support; lack of self-confidence regarding technology use; lack of in-service training (Hsu, 2016); insufficient time for the TI preparation process; lack of sufficient training for TI; and a lack of technical support (Çakır & Yıldırım, 2009; Hur, Shannon, & Wolf, 2016; Sang, Valcke, Braak, & Tondeur, 2010; Teo, 2009; Vanderlinde & van Braak, 2010).

Method

Research Design

This study was designed as a qualitative study. The research was conducted in the fall and spring terms of the 2015–2016 academic year.

Participants

This research was conducted with seven teachers from various subject specialties working at Kırklareli Merkez Atatürk Secondary School. KITaS was developed primarily to help classroom guidance teachers who are responsible for reading activities in the classroom and field experts in Turkish language education to follow and evaluate students' reading activities. Information regarding the research participants is presented in Table 1.

Table 1

List of Participants

Number of Teachers	Teachers	Gender	Branch	Experience (Years)
1	Feza	Female	Math	10
2	Şaban	Male	Turkish	16
3	Övgü	Female	English	12
4	Osman	Male	English	6
5	Şermin	Female	Turkish	18
6	Yelda	Female	Turkish	13
7	Burak	Male	Math	35

Scope

To determine the setting for this research, a school with an average socioeconomic level and a library in the provincial center was selected from the most highly populated schools in the province of Kırklareli. There are 38 teachers at the research school. After receiving the relevant authorization for the research, KITaS and research information forms were distributed to the teachers at the school two times in two weeks. Control over the level of students' reading cannot be achieved by the teachers at this school for several reasons including the following: difficulties being aware of every book that every student reads; a lack of time to determine students' reading progress; having too many students to control the process of recommending, monitoring, and assessing each one's reading progress; and inadequate course time (Arıcan, 2010; Balajthy, 2007; Türk Çocuk Vakfı, 2009; Uyar, Yıldırım & Ateş, 2011). Nevertheless, there is a need for an environment for students to discover new books to read (Doğan, 2011; Guthrie & Wigfield, 2005; Okur, 2007; Ülper, 2011) or a system

that aims to encourage students to read, motivates them to read more, informs teachers and parents, and tracks students' progress (Balajthy, 2007; Borman & Dowling, 2004; Deci, Vallerand, Pelletier, & Ryan, 1991; Magnolia Consulting, 2010; Topping & Fisher, 2003; Yıldız & Akyol, 2011). Based on these needs, researchers have started with the "100 Temel Eser – 100 Basic Books" that the Ministry of National Education (Milli Eğitim Bakanlığı, MEB) recommends that all secondary school students read. Using the KITaS, whether these books have been read can be determined and reading progress (information such as when a student started and completed a book and the number of books she or he has read) can be monitored by teachers, students, and parents. The process of introducing and actively using KITaS in a school is considered to be a technology integration process. In this context, in posters distributed at the school, the research process was introduced as well as what KITaS is, why it is important, what it accomplishes, and what kind of tool it can be.

Next, the research participants were invited to a KITaS introductory meeting. A new account was opened in KITaS for every teacher, and classes and student assignments were allocated. Each teacher logged into the KITaS interface through his or her own account. Following this, educational activities were organized according to how teachers should use KITaS and integrate it into their educational activities. These training activities were meant to be conducted in a group, but smaller groups and individual sessions were held because the teachers did not have a single shared time in common. Training for teachers was planned in two sessions. The first session focused on how teachers could use the KITaS; other activities within the scope of the session focused on how they could include KITaS in their educational activities and the role of KITaS. In the process, teachers accessed KITaS on computers in their classrooms or on their personal computers. After introducing it to teachers, KITaS was also introduced to the eighth-grade students, and they were all signed up to the system in the guidance course. As the other classes did not have guidance courses for conducting the same procedure, students were informed in computer labs, along with class guidance teachers, during long breaks and computer classes, and their accounts were activated for access to KITaS. After this phase, tasks related to the process were transferred to teachers and students. Approximately every three weeks, a researcher visited the school and checked the progress of the work by interacting with the teachers.

Research Instruments for Data Collection

Within the scope of the research, semi-structured interviews were conducted with each teacher indiviually, and every teacher completed the open-ended question form and the observation form a total of five times. All research data were collected by the same researcher, and the researchers met each week during the study period. At these meetings, researchers gathered information about the process and the situations that were encountered, and they made decisions about the necessary situations. These decisions determined the data-gathering process and the frequency of observation.

Semi-structured interview form. This included questions about the emergence of the elements mentioned in the text as barriers to the process of technology integration and other potential barriers that participants may have noticed during their observations. The form comprises 10 questions, such as, "When you consider your process of using

KITaS, is there anything that you believe would have increased your productivity when utilizing this technology?" If the answer was in the affirmative, the teacher was asked, "Could you explain, please?" The duration of the interviews conducted with the participants at the end of the application was between 35 and 55 minutes.

Open-ended questionnaire form. This questionnaire was designed to be used in the middle period of the research study. Thus, it was administered three weeks after KITaS had begun to be actively used. In this way, it was possible to understand what participants were experiencing before they had become fully accustomed to the process. The form comprises four items, such as "Have you encountered any situation that made the process difficult since you started using KITaS?" and "If so, could you explain, please?"

Observation form. A structured observation form was used to attempt to understand the situations that threatened the whole progress within the scope of the study rather than catching them through routine holistic observations. The investigating researcher attempted to understand the potential barriers as well as new barriers indicated in the literature regarding the institutional and teacher perspectives. Five observational forms were completed in this process.

Data Analysis

The analysis of the data was performed by content analysis. The researcher frequently checked to determine whether the data from the open-ended questionnaire supported the data obtained from the other forms. Research findings were directly supported by quotations. Within the scope of the research, the main symptoms of the upper theme were attempted to be determined, and the obtained themes connected to the overlying theme were examined through detailed analysis. That is, if any teacher mentioned a barrier to technology integration, he or she was directed to the following question: "Do you mean to say that the TI process will take place if the situation you are talking about is corrected?" If the teacher's answer was "Yes," then this barrier was considered to be the main theme. If the response was "No, this is not going to be enough," the researcher attempted to understand the upper theme from the responses given to the relevant sub-themes.

Validity and Reliability

Data collection instruments include direct inquiries to assist in reaching the research aims. Observations conducted within the scope of the research focused on diversity in regard to days, hours, and teachers. In addition to the diversity in the data collection tools, the tools were designed to complement each other (Morse, 1991). During the observation period, no intervention was executed regarding the subjects or individuals (Bailey, 1982). Participants were continuously kept informed and were communicated with throughout the process. The aim was to change their beliefs regarding the researchers and the continuity of the process. Within the scope of the research, the findings were directly supported by the responses of the participants.

Results

To create the themes and sub-themes, the researchers attempted to determine what barriers were seen under what causes.

Table 2

Themes and Sub-themes

	Count of Teachers ***(n)***	**Supported Themes**	**Teacher submitted with open-ended questions** ***(n)***
A) Acceptance of barriers to TI		+	
1. Lack of equipment	6	+	7
B) We conduct if MEB approves		+	
1. Considering TI as a tool rather than a process	3	+	4
2. Lack of relevant preparation			
2.1. Lack of material stock	2		2
2.2. Teachers are alone during the TI process			
- Teachers are too busy	4		5
- Numbers of students in classes are not appropriate for TI	2	+	4
- Intensity of school curricula	1		3
- Investment in TI is not continuous enough	2	+	1
- Lack of TI leader	2		
C) TI as an area of adventure on the way to the aim		+	
1. Does not support the aim of the present system	3		5
2. Not moving from the top administrator to the lowest-level practitioner, not moving from the smallest piece to the whole.	2		4

*TI: Technology Integration; MEB: Ministery of National Education (Milli Eğitim Bakanlığı)

As seen in Table 2, it was determined that the teachers experienced three main factors in the TI process. These are (A) accepting that there will continually be a number of barriers to the TI process; (B) the idea that the TI process will start with the decision of the senior official overseeing the teachers and institutions; and finally, (C) there is no reason for TI in an exam-centered approach or methodologies based on success on exams.

A) Accepting that there are some barriers in the integrations of TI

In the first meeting with the teachers, it was observed that some teachers mentioned that they did not have "computers in every class" (Observation Report [OR] 1) or in the ongoing process. "My computer at home is broken; we can access KITaS only at school..." (OR 3). Several teachers revealed their concerns regarding the issue. "It is not necessary for us to have access to the e-school application in classes, but access to KITaS requires a computer in the classroom environment. We do not have computers in every class..." (Question form; teacher: Yelda). Other teachers shared a similar sentiment:

> *… I do not know if there are general computer laboratories in every school ... We do not have computers in every class. We have smart boards in classrooms, but we cannot show the KITaS process without computers in classrooms. This is only true for the eighth grade. There are no guidance classes in other classes .*" (Interview; teacher: Şaban)

These statements reveal that teachers consider the lack of necessary equipment as a barrier to TI.

B) We obey if MEB approves

During the meetings organized by the teachers from time to time during the process, statements such as "... we are in e-school; now you are introducing KITaS. We are using it better and better every other day" (OR, 3) reveal that they interpret TI as a tool or practice, not a process. In a similar way, beliefs such as, "This training on KITaS is good. However, when we started to use KITaS, we had difficulty with it..." (Question form; teacher: Şermin), make it clear that teachers perceive TI as a transition of their organization to a program rather than taking a holistic view of TI. Interviews also support this.

> *... Now we hear that smart boards are available in some schools and so on. ...That is nice, but who is going to use the new tool? The tool will be introduced by nature and we will participate in the introduction sessions. Then 'Is there any problem regarding the e-school now?' No.…* (Interview; teacher: Burak)

It was seen that some teachers stated that "lack of preparations for TI" prevented the process, which resulted in a barrier to the TI process. Some teachers mentioned that the lack of a material warehouse caused them to struggle. "The visual and audio materials prepared with the guidebooks that are given to teachers at the beginning of the year should include the CDs" (Question form; teacher: Övgü). One of the teachers stated the following:

> *Producing materials is a separate field of expertise, and using the prepared material is a separate field of expertise. We can be offered necessary material diversity and then get a series of ongoing training sessions…* (Interview; teacher: Osman)

In the category "There is no preparation for TI," several participants stated that "teachers are lonely in the process." In this regard, some teachers emphasized their intense workloads, saying, for example, "This situation has loaded a new responsibility on our shoulders" (Question form; teacher: Saban) " and "We already have a heavy workload at the school. Every new step that comes unscheduled reduces our productivity" (Interview; teacher: Feza).

Several teachers stated that the number of students in their classrooms is too high to manage the TI process and that their school curricula should be revised with a clear plan for the inclusion of TI. "I have a busy teaching schedule and 30 students to teach in the classroom. The duration is 40 minutes. I am not ready to use resources..." (Question form; teacher: Şermin). "Yes, it would be better if the class sizes were reduced and the program's intensity could extend to the process" (Interview; teacher: Osman), explaining that the intensity of the program and the crowded classrooms are not suitable for TI.

It has turned out that a lack of continuity in the investments made for TI is a barrier to TI. "... We have a low level of dynamism for TI at school. Clearly, TI is not on the agenda. It does not seem to come to mind in such a busy schedule... " (OR, 5).

This statement regarding the situation: "It is like a fashion. It was on the agenda very much at some point ... The smart board process, for example ..." (Interview; teacher: Övgü) suggests that TI investments are not continual, which is understood as a barrier to the continuity of the process.

It was also stated that there was no one at their school to ask for help when they had difficulties in TI, which they claimed to be a barrier for them. "We are here for KITaS now. We are trying to do something. We are having difficulties" (Interview; teacher: Yelda). Another teacher stated, "Now look, you have energized us. You are telling us that we can do it, and we are doing it, too, are we not?" (Interview; teacher: Burak).

These expressions make it clear that teachers need a TI leader within their organization to facilitate the process and keep it going.

C) TI as an area of adventure on the way to the aim

Some of the participants emphasized that TI did not serve as an exam-centric perspective. "There is an intense and important exam like TEOG ahead. The TI process will not be realistic for the students" (Question form: teacher: Yelda). Another teacher said, "Let's be realistic now ... Will we do it to say that we are also doing technology integration? ... That does not reflect the reality that we are in. We are a TEOG school ..." (Interview; teacher: Şaban).

Some participants noted that TI and other transitions need to be presented to them from the senior management, including management and planning. Likewise, all the missing parts need to be completed first and then teachers have to be assigned new

tasks regarding the needed environment and program preparations. "If everything is ready for technology integration except me, then I will get ready for it, too" (Question form; teacher: Şaban). "Things are starting in the middle, and we are responsible for the rest, and we are the cause of the disruption" (Interview; teacher: Övgü).

Finally, it was stated that a lack of corporate culture impeded the TI process. The researchers took some notes in the process as follows: "We believe in this process, but we could not contact all the teachers. In the process, there was something lacking to motivate them… the inheritance of the institution, the continuity of success, making of their names and valuing individuals' commitments to their organizations that they have brought about for years" (OR, 5). Teachers took the following notes regarding this issue: "We do not have anyone who puts these into practice; I do not know" (Interview; teacher: Osman).

When the literature was examined, it was seen that the research findings aligned with those in the relevant literature. However, it was also seen that some findings in the context of the sources mentioned in the relevant literature could represent new barriers. These are listed in Table 3.

Table 3

Newly Claimed Barriers to TI

	Count of Teachers *(n)*	**Supported Themes**	**Teacher submitted with open-ended questions *(n)***
A) Accepting that there are some barriers in the integration of TI		+	
B) We conduct if MEB approves		+	
C) TI as an area of adventure on the way to the aim		+	
1. It does not serve the aim of the present system	3		5
2. Moving from the senior management to the lowest-level practitioner; from the smallest piece to the whole	2		4

*TI: Technology Integration; MEB: Ministery of National Education (Milli Eğitim Bakanlığı)

When the TI topic is the issue for discussion, it is clear that "lack of tools" has become a widely accepted issue. Although the lack of tools and equipment was mentioned as a barrier to TI, the participants cautioned the researchers by saying, "Yes, that is true, but there is also…" when they were offered current data and were

reminded of what they had at their school, which was found by the researchers to be very remarkable. The researchers took notes regarding this issue as follows:

> *It was understood that the situations which the teachers referred to as a lack of equipment did not originate from equipment that they needed and did not have in their classrooms.* (OR 5)

Furthermore, the teachers stated that the main responsibilities for TI execution belonged to the Ministry of National Education, which is the highest unit in Turkey where schools and teachers are affiliated. Researchers took the following note regarding this issue, "Teachers are performing the education and training process within the limits set by the MEB" (OR 4).

Finally, researchers concluded regarding the theme of "TI as an area of adventure on the way to the aim" as follows: "The TEOG examinations are mentioned in a way in the conversations with teachers... They seem to claim that we build a connection between TEOG and TI..." and "TEOG reality is very clear for them. They are constantly feeling this from parents, school administrators, and students ... " (OR 5). The other sub-themes are not stated again here, as mentioned above. However, it can be said that some studies related to the findings of C2 and C3 in the literature have been shown as barriers. However, the reason they were taken as a newly stated situation is that they are explained in generic terms, as the process may change depending on conventions or cultural differences. However, in this study, "not moving from the senior management to the lowest practitioner; not going from the smallest piece to the whole" appeared to be a barrier.

Discussion and Conclusion

When the relevant literature is examined, it is seen that a lack of technological resources hinders the TI process (Becker, 2000; Bingimlas, 2009; Çakır & Yıldırım 2009; Hew & Brush, 2007). The findings of this study are parallel to those of previous studies. When teachers were asked what tool they needed or what tools their organizations lacked related to technology integration, their responses regarding how they would use the technological tools in their classroom activities were found to be unclear. At this point, it is thought that researchers considered that "lack of tools for the TI process" became a commonly accepted statement. Tsai and Chai (2012) noted that, in addition to the internal and external barriers, the teachers' design-thinking skills should also be discussed. Accordingly, the ability of teachers to integrate technology into various contexts should be considered separately and holistically from internal and external barriers. Tsai and Chai also incorporated a pedagogical approach that includes internal and external barriers to current integration barrier debates. Actively using the right technology with the right strategies in teaching design and teaching process can be said to be a barrier that must be overcome by teachers and course designers (Englund, Olofsson, & Price, 2017; Pittman & Gaines, 2015; Tondeur, Krug & Zhu, 2015).

The most critical data within the scope of the research is related to the fact that the TI process can be achieved through the MEB's plans and procedures; if there is

a barrier, the MEB should be responsible for overcoming it. Teachers emphasized that their institutions are connected to the MEB; their course content, sources, and lesson plans are determined by the MEB, and the TI process is also stated as being planned by MEB. They also stated that problems such as not being provided with relevant technologies, teachers' workloads, crowded classrooms, and the fact that the educational programs are not compatible with the TI process should be resolved by the MEB. In the literature, barriers such as teachers' workloads, crowded classrooms, and the fact that the curriculum is not organized within the scope of TI have also been demonstrated (Bingimlas, 2009, Çakır & Yıldırım, 2009; Hermans, Tondeur, Valcke, & Van Braak, 2006; Hew & Brush, 2007; Vanderlinde & Van Braak, 2010). This study revealed similar findings. In some studies, it is stated that the TI process will not be completed without internalization, even though the external barriers are addressed (Kopcha, 2012; Roblyer & Doering, 2010). At this point, as no data regarding attitudes, self-confidence, and the level of relevant knowledge have been gathered, internal barriers may not have been mentioned.

Teachers stated that the results of the national tests were important for the students and for themselves as well, so students could not dedicate time to these kinds of implementations. They also stated that the TI process was unnecessary because it lacked a role related to exams. Although TI is suggested to have a pedagogically increasing role in student achievement, motivation, and process efficiency (Roblyer & Doering, 2010), the responses taken from the participant teachers seem to contradict this viewpoint. The main issue that teachers have addressed regarding this position is that students have to cope with frequent and copious testing and problem-solving activities.

Apart from these concerns, the teachers also stated that the TI process started in a reversed manner and that the arrows were directed at them. In this process, they had already agreed with the decisions made but had not made the necessary preparations for the process. They stated that the process should have a two-way direction. The first is that decisions are made by senior officials; relevant preparations are established; and then teachers are instructed to perform the rest. The second path is that relevant materials and other sources for TI are prepared, and then the teachers are given relevant teacher training and instructed to integrate the newly learned technology into their educational activities. Teachers stated that the process could function effectively in this way.

When the relevant literature was examined, it was found that several barriers to the TI process were not mentioned or mentioned rarely, although most of them were found to be quite similar to those revealed by the present study. The reason for this may be the lack of data collection tools for the internal dimension within the limitation of this research. The fact that no data were gathered regarding the teachers' knowledge, skills, attitudes, and self-efficacy for technology and technology integration may be interpreted as there being no deficiency in this regard. However, data were not collected separately according to internal and external barriers within the scope of the research. Participants themselves indicated this situation. In addition, the preparation of the teachers for the process within the scope of the research may have alleviated the effects of these barriers. However, different studies should be designed to clarify this situation.

Within the scope of this research, the barriers similar to those found in the literature have been established, as well as the barrier that does not directly correspond to those in the literature. Depending on changing conditions, it seems that new barriers to technology integration (believing that the top unit of an institution at which teachers work decides whether to enter the process of technology integration, and accepting that there are always some barriers to technology integration) emerge, while others barriers (deficiency in technology resources) are found to decrease. In this process, the context should also be considered. When we examine these barriers, we can interpret that these are caused by systematic, cultural, and structural features. Further research can be designed to examine to what extent these barriers are prevalent across the country. In addition, studies can be conducted to determine the situation before and after professional development activities. Thus, the influence of professional development activities can be examined. In addition, the areas of education that teachers need can be identified. In the process of integrating technology into teaching environments, policymakers can attach importance to the development of material warehouses. How the same curriculum can be maintained with alternative methods and materials can be investigated. In this case, examples of applications can be created.

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Teknoloji Entegrasyonu Önündeki Yeni Engeller

Atıf:

Şahin İzmirli, Ö. & Kırmacı, Ö. (2017). New Barriers to Technology Integration. *Eurasian Journal of Educational Research, 72,* 147-166, DOI: 10.14689/ejer.2017.72.8

Özet

Problem Durumu: Eğitsel araç olarak teknolojinin eğitimde tercih edilmesinin bir çok nedeni bulunmaktadır. Öğretimsel açıdan teknolojinin öğrenci başarısını, motivasyonunu ve süreç verimliliğini artırıcı rol oynaması nedenleriyle değerli bir unsur olarak dikkat çekmektedir. Öğrenci boyutuna ek olarak öğretmenlerin de teknoloji kullanım becerilerini artırdığı ve alan uzmanlıklarına katkı sağladığı belirtilmektedir. Tüm bunların yanı sıra öğretim yöntem ve tekniklerinde çeşitlilik alternatifleri de sunup, eğitmenin yönlendirici, öğrencinin ise aktif öğrenen rollerinin etkili bir şekilde uygulanması için fırsatlar sunmaktadır. Teknolojinin eğitime entegrasyonunun farklı boyut, kaynak ve değişkenlere bağlı olması nedenlerden dolayı sürecin bir takım sınırlılıklarından da bahsedilmektedir. Bu çerçevede öne çıkan engeller teknolojiye sınırlı erişim, kalabalık sınıflar, donanım ve yazılım eksikliği, teknoloji entegre edilmiş derslerin uygulamasındaki zamanın yetersizliği, öğretmenlerin teknolojiye karşı olan tutumlarının olumsuz olması, teknolojiye ilişkin bilgi eksikliği, teknoloji kullanım becerilerinin düşüklüğü, teknolojinin rolüne inanmama, teknoloji kullanımının sağladığı katkının bilincinde olmama, yönetim desteğinin eksikliği, teknoloji kullanımına ilişkin özgüven eksikliği, hizmetiçi eğitim eksikleri, teknoloji entegrasyonu (TE) için ön hazırlık süreci için yeterli zaman tanımama, derslerde TI için yeterli sürenin kalmayışı ve teknik destek yetersizliğidir. Ancak geçen süreçte araştırmacılar bazı sınırlayıcı durumların da değişmeye başladığını belirtmiştir. Teknolojinin eğitime entegrasyonunun çok boyutlu bir süreç olması ve başarısının çok fazla değişkene bağlı olması nedeniyle bu engellerin değişen şartlar altında (alt yapı imkânlarının iyileştirilmesi, mesleki gelişim etkinlikleri vb.) yeniden incelenmesine ihtiyaç duyulmaktadır.

Araştırmanın Amacı: Bu çalışmada Kırklareli'nde bir devlet okuluna uygulamaya yeni dâhil edilecek bir Web sistemin eğitsel etkinlikler ile tanıtımı ve uygulanması aşamasında öğretmenlerin karşılaştıkları entegrasyona dayalı problemler tartışılmıştır. Bu Web sistemi, ortaokul öğrencilerin kitap okuma etkinliklerinin

çevrimiçi takip ve değerlendirmesine imkân veren "Kitap Okuma Etkinliklerinin Takip ve Değerlendirme Sistemi" (KİTaS) dir. Bu yeni sistemin uygulamaya geçmesi aşamasında öğretmenlerin karşılaştıkları engeller belirlenmeye çalışılmış ve alanyazınla karşılaştırılarak değişen engellerin profili ortaya koyulmuştur. Bu kapsamda araştırma soruları şu şekildedir;

- Öğretmenlerin KİTaS'ı öğretim etkinliklerine entegre etme sürecinde karşılaştıkları engeller nelerdir?
- Öğretmenlerin bu süreçte karşılaştıkları alanyazından farklı olarak diğer engeller nelerdir?

Araştırmanın Yöntemi: Araştırma nitel olarak desenlenmiştir. Araştırma 2015-2016 eğitim öğretim yılı güz ve bahar dönemlerinde Kırklareli'nde yedi öğretmen ile gerçekleştirilmiştir. Araştırma sorularının yanıtları görüşme, açık uçlu soru formu ve gözlem yoluyla elde edilmeye çalışılmıştır. Araştırma kapsamında her bir öğretmenle birer kez yarı yapılandırılmış görüşme gerçekleştirilmiş, her bir öğretmen açık uçlu soru formunu doldurmuş ve beş kere gözlem formu doldurulmuştur. Verilerin analizi içerik analizi ile gerçekleştirilmiştir.

Bulgular: Araştırmanın öne çıkan bulguları (A) Teknoloji entegrasyonu sürecinde devamlı bazı engellerin olacağını kabul etme, (B) Teknoloji entegrasyonu sürecine geçilebilmesine öğretmenin çalıştığı kurumun en üst birimin karar verebileceği düşüncesine sahip olma ve (C) sınav merkezli ve sınavda başarılı olma yaklaşımında, teknoloji entegrasyonuna gereksinim duymamadır. Alanyazın incelendiğinde araştırma verilerinin alanyazın ile büyük ölçüde örtüştüğü görülmektedir. Öte yandan araştırmacılarının alanyazında belirtilen kaynaklar çerçevesinde bazı bulguların yeni engel durumlar olarak belirtilebileceği anlaşılmaktadır. Bu bağlamda teknoloji entegrasyonunda engellerden konu açılınca "araç-gereç eksikliği" nin ifade edilmesi ve bunun tam dayanaklandırılamaması, artık bu durumun kabul edilmiş bir durum haline geldiğini göstermektedir. Öte yandan öğretmenler TE'ye ilişkin adımlarda esas sorumluluğun, Türkiye'de okulların ve öğretmenlerin bağlı olduğu en üst birim olan Milli Eğitim Bakanlığı'nda (MEB) olduğunu belirtmişlerdir. Bu çerçevede MEB'in bu süreci yönetmesi ve planlaması gerektiğini belirtmişlerdir. Bunların yanı sıra öğretmen, öğrenci ve veli odağında sınav telaşının bulunmasından dolayı, amaca yardımcı olmayan bir uğraşı olarak düşünüldüğünü belirtmişlerdir. Bu öne çıkan üç bulgunun yanı sıra alanyazında doğrudan belirtilmeyen ya da genel ifadelerle anlatıldığı için alanyazından farklılaşan diğer engeller de bulunmaktadır. Bunlar TE'nin Türkiye'de varolan sistemin yapısı ile örtüşmemesi nedeniyle kullanılmaması ve sürecin tamamen öğretmene bırakılmış olmasıdır. Bunlara benzer engeller alanyazında belirtilmesine rağmen farklı kültür ve sistem özellikleri çerçevesinde anlatıldığı için bu araştırma bulguları diğer bulgulardan farklılaşmaktadır. Öğretmen TE sürecinin merkezinde öğretmen yer almasına rağmen sürecin işlerliğinin esas kendilerinde olmadığını belirtmişlerdir. Bu sorumluluğun MEB'de olduğunu ve süreç için tüm hazırlıkların yapılması gerektiği ve sonrasında öğretmenlere bırakılması gerektiğini belirtmişlerdir.

Sonuç ve Öneriler: Araştırma kapsamında en yoğun veri, TE sürecinin MEB'in planlamaları ve işlemleri üzerinden sağlanabileceği ve eğer bir engel durum varsa

bunu MEB'in aşması gerektiğine ilişkindir. Öğretmenler kendilerinin ve kurumlarının MEB'e bağlı olduğunu, ders içeriklerinin, kaynaklarının, planlarının MEB üzerinden belirlendiğini vurgulayarak, TE sürecinin de MEB üzerinden planlanması gerektiğini belirttiler. TE sürecinde engel olarak belirttikleri teknolojik kaynakların sunulmaması, öğretmen yoğunlukları, sınıf mevcutlarının kalabalıklığı ve öğretim programlarının TE süreci ile uyumlu olmaması durumlarını da MEB'in çözmesi gerektiğini belirttiler. Araştırma kapsamında alanyazın ile benzer çıkan engellerin yanı sıra alanyazın ile doğrudan örtüşmeyen engeller de ortaya çıkmıştır. Değişen şartlara göre teknoloji entegrasyonu engellerinin bazılarının değiştiği (TE'ye ilişkin sorumlulukların sistem içerisindeki birimlere paylaştırılması, TE için dış engellerin var olacağı önyargısı), bazılarının etkisinin azaldığı (teknolojik kaynak yetersizliği) görülmektedir.

Anahtar Sözcükler: Teknoloji Entegrasyonu önündeki engeller, öğretmen eğitimi, Teknoloji Kullanımı Sınırlılıkları.