Educational Sciences: Theory & Practice - 13(2) • Spring • 1273-1284

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Challenges School Principals Facing in the Context of Technology Leadership*

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Abstract

The purpose of this study is to determine the challenges school principals facing in the context of technology leadership. This is a qualitative case study guided by the National Educational Technology Standards for Administrators (NETS*A). Six elementary school principals working in a large city in southeastern Turkey participated into the study. The data were collected through face-to-face interviews via a semi-structured interview protocol. The data collection tool was developed through pilot studies based on expert opinions. The data were analyzed through a thematic approach and validity and reliability were investigated via peer-review, member checking, and inter-coder reliability processes. The findings show that in assuming their roles as technology leaders school principals face various challenges, including bureaucracy, lack of resources, resistance to innovation, lack of in-service training, and poverty. Based on the findings, various measures are recommended to diminish bureaucratic obstacles and organize sustainable in-service training activities in order to overcome the challenges that school principals are facing in the context of technology leadership.

Key Words

Technology Leadership, Challenges in Technology Leadership, NETS*A.

Technology leadership, an indication of managing all technology usage in schools, is an essential component of effective educational administration (Anderson & Dexter, 2005; Dawson & Rakes, 2003; Flanagan & Jacobsen, 2003; Geer, 2002; Hughes & Zachariah, 2001; Woelfel, Murray, & Hambright, 2004). School administrators with necessary skills of technology leadership are more likely to facilitate all stages of instruction and school management by effectively integrating educational technologies into school life (Anderson & Dexter, 2000). The level of technology leadership highly reflects the quality of leadership in school; as being good at technology leadership is associated with high quality school leadership. Technology leadership represents all activities about the technology in school, including organizational decisions, policies and implementation of technology within the boundaries of the school (Anderson & Dexter, 2005; Dexter, 2011; Fletcher, 2009). Research findings have shown that technology leadership positively influences leadership skills of school administrators (Dexter; Langran, 2006; McLeod & Richardson, 2011; Richardson & McLeod, 2011; Rutkowski, Rutkowski, & Sparks, 2011; Scott, 2005).

* This paper was revised after being presented at 6th International Computer and Instructional Technologies Symposium, Gaziantep, Turkey, 4-6 October 2012.

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The literature contains various suggestions about using technology in school administration (Anderson & Dexter, 2005; Keengwe, Kidd, & Kyei-Blankson, 2009; Leonard & Leonard, 2006; McLeod & Richardson, 2011; Reddish & Chan, 2007; Ritzhupt, Hohlfeld, Barron, & Kemker, 2008; Stuart, Mills, & Remus, 2009). Among those suggestions, the International Society for Technology in Education (ISTE) has provided a core list of standards, the *National Educational Technology Standards for Administrators* (NETS*A) which has been the mostly acknowledged standards to open a way for effective technology leaderships (Brooks-Young, 2006; Creighton, 2003; Papa, 2011; Reddish & Chan).

National Educational Technology Standards for Administrators (NETS*A)

The ISTE`s standards for technology leadership (NETS*A) were developed to help school leaders to "support digital age learning, implement technology, and transform the education landscape". The NETS*A were grouped under five main themes: visionary leadership, digital age learning culture, excellence in professional practice, systemic improvement and digital citizenship (ISTE, 2009). Moreover, the NETS*A reflects all efforts to move schools one step further and is a key factor in restructuring schools to cope with the demands of the ever-changing society (Benedetto, 2006; Mirra, 2004; Schrum, Galizio, & Ledesma, 2011; Valdez, 2004; Yu & Durrington, 2006). Likewise, the NETS*A also has intended that school principals should understand their roles as technology leaders, provide technological needs of all stakeholders, and fully accomplish technology integration in the educational process (Anderson & Dexter, 2005; McLeod & Richardson, 2011; Richardson & McLeod, 2011; Sincar & Aslan, 2011). In addition, the NETS*A can be seen as one of the reflections of change efforts in educational policy. New tasks were imposed on school principals; for instance, now, school principals are seen as technology leaders who are to maintain and sustain effectiveness of the technology and keep the system up-date (Stuart et al., 2009; Wang, 2010).

Technology Leadership Models

The NETS*A has also influenced the way educational theorists modeled how school leaders should design, manage and evaluate the use of technology in educational institutions. The literature indicates that there are three significant models for technology leadership (Anderson & Dexter, 2005; Davies, 2010; Flanagan & Jacobsen, 2003). Each of these models has its own uniqueness and strengths. Firstly, Flanagan and Jacobsen determined technology leadership roles for school principals about how to integrate technology into educational contexts and listed related responsibilities of the principals emerged from their roles as technology leaders. The model identified five role responsibilities, including leader of learning, leader of student entitlement, leader of capacity building, leader of community and leader of resource management. The role responsibilities were put together a set of aims: student engagement, shared vision, equity of access, effective professional development, and ubiquitous networks. Likewise, Anderson and Dexter also developed a technology leadership model with the participation of a large group of participants. The model included technology leadership indicators that are technology committee, school technology budget, district support, principal e-mail, school principal's days (on technology), grants, intellectual property policies.

Both models serve as essential mediums to describe principals' roles and responsibilities that show what technology leadership should be; however, it is seen that there is no harmony between the two models (Davies, 2010). Davies noticed that there is a gap in the literature about educational or school technology leadership, and she criticized Anderson and Dexter's, and Flanagan and Jacobsen's models because of their limited scopes. Additionally, in another study, Christie and Lingard (2001) stated that a technology leadership model should include; "(a) the complex interplay between the personal/biographical, (b) the institutional/organizational, and (c) broader social, political and economic context" (p. 8). Based on Christie and Lingard's assertions, Davies noticed that both the Flanagan and Jacobsen's, and Anderson and Dexter's frameworks did not consider "broader social, political and economic context". As a result, she suggested a different framework involving the broader social, political and economic context of technology leadership. In Dexter's model, she identifies internal and external factors that potentially influence the effectiveness of educational technology leadership. Even if all technology leadership models have different features, they have a common goal which is to provide the necessary proficiencies for school principals under the guidance of the NETS*A so that they could be effective technology leaders. The models portrayed an ideal picture of effective technology leadership; however, it is clear that there are always challenges in utilizing the different necessities of technology leadership (Yee, 2000).

Challenges in Technology Leadership

Having acquired all necessary requirements of the NETS*A does not guarantee that the school administrator can effectively lead the school for a better technology usage in educational landscape. From a different perspective, no models can foresee all challenges that can appear along the way. It is essential that the challenges that school principals face should be identified and relevant strategies to ease such challenges should be devised and implemented. For this purpose, we need a large body of research on challenges likely to occur in technology leadership; however, only a limited number of studies have been conducted on this issue.

The previous research on challenges in technology leaderships has shown that school administrators experience some challenges in their practices. These challenges can be summarized under five major themes technology training, resistance, resources, equity and bureaucracy (Table 1). Each theme contains a number of interrelated challenges that have been emerged from the research.

Lack of Training: The research indicates that lack of training in the use of technology is a major challenge for school leaders. Technology leadership training is a key factor in the context of technology leadership (Flanagan & Jacobsen, 2003; Schiller, 2003; Thomas & Kzenek, 1991; Wang, 2010). Thomas and Kzenek found out that the need for technology training in teacher and administrator preparation was consistently identified as the overwhelming need for making technological innovation a reality in schools. Additionally, Flanagan and Jacobsen stated that inadequate staff development, lack of informed leadership and pedagogical issues are strong barriers for school principals while they aim to integrate technology in educational landscape. Likewise, Schiller found out that the level of ICT skills is very important for school principals to understand their role in the use of ICT in schools.

Resistance: Another challenge can be defined as the resistance from the school community, especially from teachers (Dawson & Rakes, 2003; Richardson & McLeod, 2011). It is not surprising that teachers would show some degree of resistance to changes in their teaching practices as the process of technology integration requires teachers to modify what they have been doing for years. Yet, it is still possible for teachers to accept the new ideas if they see the patience and support from the school administrator (Dawson & Rakes). Another challenge in this theme is unreceptive staff. In their study, Richardson and McLeod reported that six principals in nine schools experienced challenges due to unreceptive staff. When teachers do not have the necessary skills and interest in using the technology, it would be a major challenge staying ahead of the principal.

Resources: Lack of resources is seen as another major challenge for school principals in their technology leadership. The research literature reports that lack of technological facilities and human resources were emerged as challenges for school leaders. While in many schools not having adequate technology creates a challenge for the school principal (Leonard & Leonard, 2006), as seen in a recent study (Wang, 2010), it was noted that in many schools there exits all necessary technological facilities; however, the school leaders do not have the necessary skills about how to manage the resources. Similar challenges were emerged from Richardson and McLeod's (2011) study in which they have found out that having poor physical facilities and outdated technology were challenges in technology leadership. Thomas and Kzenek (1991), and Leonard and Leonard (2006) noted similar challenges. Regarding the lack of human resources, it was found out that in some schools school leaders could not find skilled technology coordinators (Thomas & Kzenek; Richardson & McLeod).

Equity and Bureaucracy: Some school principals noted that equity issues were among the challenges in technology leadership. Flanagan and Jacobsen (2003) indicated that school-based technologies are not equally distributed among all schools. While some schools receive more funding and resources, others are poor in many of these. It should also be noted that the disadvantaged schools are mainly located in areas where people with less income and diverse backgrounds live. These people are isolated due to their socioeconomic backgrounds (Richardson & McLeod). Bureaucracy was also cited as another challenge which highly slowed down the technology leadership practices (Nance, 2003).

Significance of the Study

Most of the studies conducted in the context of technology leadership in different countries are carried out within the framework of the *National Educational Technology Standards for Administrators* (NETS*A) developed by the ISTE (McLeod & Richardson, 2011). Although those studies were conducted in different countries with diverse conditions and needs, they all followed the same NETS*A framework. When education systems are considerably different from one another, it may

Table 1.
Technology Leadership Challenges for School Principals

Themes	Challenges
Lack of Training	Lack of technology training (Schiller, 2003; Thomas & Kzenek, 1991) Inadequate staff development (Flanagan & Jacobsen, 2003) Lack of informed leadership for technology planning (Flanagan & Jacobsen, 2003) Pedagogical issues (Flanagan & Jacobsen, 2003)
Resistance	The resistance of teachers (Dawson & Rakes, 2003)
	Unreceptive staff (Richardson & McLeod, 2011)
Resources	Lack of resource management (Wang, 2010)
	Lack of resources (Leonard & Leonard, 2006)
	Poor physical facilities (Richardson & McLeod, 2011)
	Inadequate technology infrastructure (Leonard & Leonard, 2006)
	Inadequate facilities (Thomas & Kzenek, 1991)
	A dearth of technology coordinators (Richardson & McLeod, 2011; Thomas & Kzenek, 1991)
	Outdated technology (Richardson & McLeod, 2011)
Equity	Concerns about equity (Flanagan & Jacobsen, 2003)
	Isolation and poverty (Richardson & McLeod, 2011)
Bureaucracy	Bureaucracy (Nance, 2003)

not be feasible to expect the same outcome when technology leadership is at stake. School principals work under different conditions and encounter different challenges in each country. Thus, it is essential to investigate the nature of challenges school principals experience in diverse conditions. The significance of the present study is to explore how the NETS*A framework explains the Turkish education context which has not been studied via the NETS*A perspective. Within the scope of the present study, the challenges that Turkish school principals face in technology leadership context are determined and discussed. Potential findings of the study are likely to inform our conception of and practices in technology leadership in Turkey.

Method

A qualitative research methodology (Cresswell, 2007) was conducted to determine the challenges that school principals face in the context of technology leadership. In this qualitative research, the participants were selected via the use of maximum variation sampling technique, which is utilized to reach an appropriate sample that represents the population.

Participants and Data Collection

The findings are based on the interviews conducted during the first half of 2012with six elementary public school principals from a large city in southeastern Turkey. In order to reach maximum variation in the sample, first the school district was divided into three areas with respect to the socio-economic level of the school location: low, medium, and high. Then, a total of 15 school principals equally representing each socioeconomic level (5 schools in each) were contacted by phone. School principals were informed about the research, and invited to participate into the study. Following the calls, five principals declared that they did not want to take part in the study. The remaining ten school principals accepted the invitation for participation. While arranging possible interview dates, one of the principals indicated that he would not be available for the interview for his busy schedule. Thus, interview appointments with a total of nine school principals were set.

The researcher conducted face-to-face interviews with the nine participants at their schools. While six interviews were audio recorded, three participants did not want the interviews to be recorded. The researcher took notes of what the three participants shared during the interviews. However, three school principals who were voluntary at the beginning either did not want to answer most of the questions or abstained from giving in-depth answers which resulted in low-quality data. Thus, the data obtained from these three school principals were excluded. Consequently, only the data obtained from six school principals were actually used. Each participant was given a code to keep their identities confidential. Table 2 shows that characteristics of the schools the six participants were working.

Table 2.
The Characteristics of the Schools Where the Participants Work

	Codes of the Participants					
School Characteristics	P1*	P2	P3	P4	P5	P6
Socioeconomic status	Low	Low	Medium	High	High	Low
Number of students	900	520	600	850	1200	2000
Number of teachers	33	20	27	34	49	61
Number of assistant principals	2	1	1	2	2	4
Number of computer labs	-	1	-	1	1	1
Number of computers	6	20	5	50	37	30
Number of projectors	3	1	19	28	16	30
Number of smart boards	1	-	1	1	1	16
Number of photocopiers	1	1	4	2	1	1
Wireless network connection	Available	Available	Available	Available	Available	Available

*P1 (Participant #1)

Data Collection and Analysis

Data were collected by means of face-to-face interviews. A semi-structured interview form was used in the interviews. To prepare the interview form, expert opinions of three education faculty members were received, and the relevant literature was reviewed. The interview form was created in consideration of the opinions obtained from the faculty members and through the literature review. In particular, statements and questions in the form were constructed based on the criticisms, opinions, and recommendations of two specialized faculty members. Then, the opinions of a faculty member were received, and necessary corrections were made in order to ensure clarity, comprehensibility, and orthographic correctness of the statements in the interview form. The form consisted of three sections. The first section contained an introduction text including purpose, scope, and motivation of the study as well as the average interview duration. The second section was made up of 37 main questions and 34 sub-questions to help principals provide in-depth answers to the main questions. Finally, the third section consisted of an information form aimed at collecting descriptive characteristics of participants and of the institutions where they were working.

Pilot interviews were conducted with two school principals with characteristics similar to the actual six participants in order to test whether the items could thoroughly examine the issues expected to be elucidated. Then, the interview form was finalized based on expert opinions. Prior to the interviews, the interview form was sent to participants via e-mail to inform them about the process. The researcher explained the participants that an audio recording system would be used during the interviews, the audio recordings would be transcribed later on, and the research data would be obtained through the analysis of transcribed texts.

For data analysis, content analysis was performed via carefully examining the transcriptions of the interviews. Subsequently, the codes constituting the research framework were formed (Boyatsiz, 1998; Cresswell, 2007; Patton, 2002; Strauss & Corbin, 1990). Validity and reliability of the findings were investigated through peer debriefing, member checks, and inter-coder reliability processes (Boyatsiz; Cresswell; Lincoln & Guba, 1985; Miles & Huberman, 1994).

Peer Debriefing

A peer is a person who is outside the context of the research and is not interested in the topic under examination: but, is knowledgeable about educational research methods and capable of discussing problems about the research process with the researcher (Lincoln & Guba, 1985). The researcher and the peer can talk about data collection process, findings, results, and conclusions. Discussions conducted with the peer can introduce the researcher to diverse ideas that force the assumptions of researcher in regard to findings. Inclusion of a peer in the research process does not only ensure a more comprehensive data analysis, but also introduces a critical point of view (Lincoln & Guba). Two education faculty members who are specialized in qualitative research methods took part in the present study as peers. At this stage, the transcriptions of the interviews were examined by the researcher and the peers independently. In addition, the participants' responses were examined by the peers, and discussions were held in regard to possible codes and themes.

Member Checking

Member checking refers to the process where the participants examine the transcribed data and reflect on the researcher's conclusions and interpretations based on the data. This process allows researchers to determine whether their interpretations accurately reflect the participants' real experiences and feelings (Lincoln & Guba, 1985). In the present study, for member checking, interview transcripts were sent to the participants for their confirmation that the transcripts reflect their actual statements.

Inter-Coder Reliability

Inter-coder reliability refers to the degree to which two coders come to agreement in regard to the quality of any data coding (Boyatsiz, 1998; Miles & Huberman, 1994). Both coders must have comprehensive knowledge and competence about educational research methods and the research topic. The researcher and a faculty member specialized in the field of educational administration took part in the present study as the data coders. The researcher and the second coder independently examined and coded the transcripts of the interviews. At this stage, the codes formed by reading the transcripts were compared twice at different times. An inter-rater consistency of 83% was reached. This level of agreement is a considerably high value for inter-coder reliability studies (Boyatsiz; Miles & Huberman).

Results

This section presents the challenges that six elementary school principals facing in the context of technology leadership. The findings are formed under the five themes; bureaucracy, lack of resources, resistance to innovation, lack of in-service training, and poverty.

Bureaucracy

The findings show that school principals face various bureaucratic obstacles as they acquire and integrate technology. All participants stated that their attempts to integrate technology in educational contexts have always been delayed or prevented by the bureaucracy. They also noted that it was mostly difficult to overcome bureaucratic obstacles. Some extracts from the interviews are as follows:

> Let's suppose that I need equipment. I convey my request to higher authorities through necessary correspondences. My request reaches the ultimate decision-maker through certain bureaucratic stages, but the responsible person does not give me the equipment. I ask for help from people who can have influence over that authority. I try to receive this equipment by having them call that authority. This is really bad. I have to have friends who can pull strings in order to bring the equipment of state to the school I work. The bureaucracy of state raises difficulties for itself (P2).

> would like to bring more technological devices to my school. For example, I want every classroom to have a smart board. However, the Ministry has sent a letter (official letter) recently. It says, "Do not turn schools into technological garbage dump, we will give necessary support through a project". We have given up our target due to this letter. We were about to receive 3 smart boards and 3 projectors prior to this letter. Then, we gave up. What happened? The Ministry sent another letter, and said that the equipment would be delayed somewhat. What can I do now? If we received these devices, both teachers and students would be using up-to-date technologies now. However, it did not come true. We are waiting for nothing. We must make a move (P4).

Another research finding is that bureaucracy prevents or delays introduction of up-to-date technologies into schools due to planning errors. In this regard, most participants (N=5) stated that they missed several opportunities, which inflicted a heavy blow in the quality of education. Views of a participant about this topic are as follows:

> Last year, a company was going to establish a lab at our school. The company was planning to purchase and donate many computers and related devices to our school. However, the Ministry did not approve purchasing or donating computers to schools due to one of the Ministry's recent projects. It was reported that a tablet PC would be provided to each student, and related materials would be prepared within the scope of that project. However, there has been no progress for us so far. If they had allowed establishment of the lab last year, students could have taken more lessons including technology until the products were delivered within the scope of the project. Now we have learnt that tablet computers would be given to high schools in the first place. It means that tablet computers will be delayed for at least four years. This is bureaucracy. It does not serve, but blocks our attempts. (P5).

Participants (N=4) also mention that bureaucracy raises difficulties about not only the fulfillment of equipment demands, but also the consideration of educational demands concerning technology. According to the participants, this situation leads to dismay, especially among the teachers and administrators who want to develop themselves. Views of a participant about this topic are as follows:

> I personally went to the Provincial Directorate of National Education one day. I told them, "I demand a basic computer course for teachers at my school. A computer teacher who works at another school will help us voluntarily for this course project. Please show us a school with a lab so that we can receive training by using the facilities there." The officers gave me the following answer: "The Ministry of National Education is currently doing the necessary planning. However, all demands have been rejected this year. We cannot carry out an activity which is not included in our in-service training plan just because you demand it." You see. We would like to improve ourselves, and find a trainer for this purpose, but it is rejected due to bureaucracy. What can I do more? (P3).

Another adversity caused by bureaucracy for school principals was delays in the evaluation process of the technological demands coming from schools. Some participants (N=3) said that bureaucratic mechanisms extended the evaluation process of the demands coming from schools over a long period of time, and mostly rejected these demands. It is emphasized by the participants that this situation prevents creation of a vision concerning the use of technology in education, and adversely affects the motivation of teachers. Views of a participant about this topic are as follows:

> We depend on the Ministry in almost all aspects. We can work as much as the Ministry supports us. We demand computers, projectors, printers, etc., but the Ministry does not send them. Under these circumstances, we cannot develop a vision concerning the use of technology at our school. We deliver our demands, but we receive an unfavorable reply after months. We lose time for nothing. Courses are somewhat dry without technology. We have made so many demands for the introduction of technology and in-service training, but they have always served unfavorable replies. Therefore, all of the staff at school comes to have a poor motivation (P1).

Lack of Resources

Research findings indicate that one of the challenges facing school principals in the context of technology leadership is lack of resources. Participants stated that the Ministry of National Education did not give adequate support to schools. Participants also highlighted that schools did not have any budget for necessary expenditures in this regard. Most of the technologies used by them were old, and there was no technical personnel to support schools in case of problems. Most participants (N=5) have a common ground in this matter. Views of a participant about this topic are as follows:

> We need a big number of computers and technological tools. We have insufficient number of projectors. Teachers use blackboards during lessons. The Ministry (what is meant here is the Ministry of National Education) does not give adequate support. I can even say that it does not give any support in this matter. Current devices are very old. We have an inadequate infrastructure. We cannot have the broken computers repaired. Let alone technology, we do not have any budget allocated to us for fulfilling any need of the school. Parent-teacher association does not have any money, either. We put aside the broken devices. If we could have them repaired, they would definitely serve everyone at the school. The school has no technical personnel for it (P2).

Most participants (N=5), who could not receive adequate support from the Ministry of National Education for the introduction of technological tools into their schools, mentioned that they made demands from different organizations in the school surroundings in order to purchase the tools they needed. However, these kinds of demands were usually rejected. Some extracts from the interviews are as follows:

> One day, I went to meet the mayor of our region to ask him to donate computers to our school. I talked with him for almost one hour. I made detailed explanations about the needs of our school. As I was very insistent, he said that he would contribute to us. However, while I was waiting for a lab, he told me that he would grant a computer. I felt as if I had been belittled at that moment. After days, he sent the computer to our school. I was shocked because the computer was very old and poor. I was so angry that I sent it back. If our school had a budget, I would not have to demand anything from anyone (P1).
>
> When I came into office, there was just one computer and one projector at the school. Now, each

> classroom has one computer and one projector (there are 30 classrooms in total). We achieved it through sponsorship. It was not possible to receive so many devices from the state. Moreover, the poorest people of the city live in the area where the school is located. So, I visited many factories in order to find a sponsor. People compete to help when you properly communicate with them though sometimes you may be treated like a bagger. (P6).

All participants expressed that the support of parents is the most important factor to overcome the difficulties caused by lack of resources in the process of introducing educational technologies into schools. The participants stated that the Ministry's banning of accepting donation from parents during matriculation posed a risk for them, but taking such risks in search of quality in education was more important than their own careers. Views of a participant about this topic are as follows:

> Our school currently has 19 projectors in total. I can say that this is a noteworthy number for a state school. Of course, all these projectors are purchased by parents. Thus, we try to explain parents that the use of technology in education is critical for our students' success then, we demand support from them. However, we cannot demand money from them. Consequently, parents with a good economic condition come together to purchase and donate to school some technological tools including projectors, computers, etc. Otherwise, we would not have them because our school does not have any budget to purchase these kinds of technological tools (P3).

Some participants (N=3) told that the support of parents and people or organizations in the school surrounding sometimes caused problems for school administrators. Participants mentioned that the Ministry of National Education instructed schools not to receive any donation from parents during the matriculation process. So, donations provided without their approval or outside their knowledge mostly harmed school administrators' careers. Views of a participant about this topic are as follows:

> There are old technologies at my school. The newest one is 5 years old. However, I cannot purchase new technologies because we do not have any allowance. The father of one of the students donated some money in this regard. He directly deposited money in the bank account of the school. An investigation was launched against me on the grounds that I had received donation. The reason of higher authorities is that no donation can be received at matriculation period even if such donations are provided voluntarily. What can I do now? The parents deposit money in the bank account of the school outside my knowledge. Then, I am punished on the grounds that voluntary donation has been provided to the school. This is really ridiculous. The Ministry prevents the donations provided by the parents of the students while not giving up-to-date technologies to the school (P5).

Resistance to Innovation

Research findings show that teachers resist to the attempts made by school principals in the context of technology leadership. All participants stated that especially the teachers who were close to retirement avoided the use of technology in education. Views of a participant about this topic are as follows:

> I can say that almost all teachers at my school have got into the habit of using technology in education. Just a couple of teachers are unwilling to use technology. They are already close to retirement (P3).

Participants (N=2) also stated that teachers resisting to the use of technology at school adversely also affected young teachers' behaviors in particular. Views of a participant about this topic are as follows:

> A large majority of teachers lean towards the use of technology in education. Especially young teachers are very good in this matter. They trust in this practice. However, experienced teachers, those who are close to retirement in particular, are very resistant, and adversely affect other teachers, too. Some of the teachers with a long period of service decrease motivations of the teachers who are open to change. Their make very discouraging statements, such as "use or non-use of technology will not bring about any progress in careers of teachers, thus it is meaningless to make an effort to use technology" (P1).

On the other hand, half of the participants mentioned that they purchased the technological tools most appropriate for the teachers who resisted to the use of technology in education in order to motivate them. The participants also encouraged those teachers to cooperate with young teachers who were competent in the use of technology and would guide them. However, they achieved no result at the end of this process. Statements of a participant about this topic are as follows:

> I can say that almost all teachers at our school are open to innovation. We share ideas when we find an opportunity. However, the teachers who have a very long period of service, are unfamiliar with technology, and do not support the use of technology in education. For example, we have provided one of these kinds of teachers with a new laptop, just recently. Our primary purpose was to increase his/her motivation. We wanted him/her to understand that we cared about him/her. In addition, young teachers told that they would help him/her prepare course materials. However, this teacher does not use computer in his/her lessons. When we ask him/her why s/he does not use it, s/he says that it is broken or makes up different excuses (P4).

Another research finding is that some teachers who were quite competent in the use of technology in education did not make an effort to provide higher quality education or perform their tasks better. Most participants (N=4) expressed this situation as indifference, but stated that there was nothing to do with the teachers armored with the "civil service" position in this connection. Views of a participant about this topic are as follows:

> There is a teacher at my school. S/he can play all kinds of games and tell fortunes at computer, but s/he does not use technology in his/her lessons. S/he resists to the usage of technology in education. S/he prefers to use traditional methods. I have failed to have him/her use technology. We cannot send him/her to another school as s/he is a civil servant (P5).

Participants highlighted that the teachers resisting to innovation and giving people around negative messages in this matter, were isolated at schools. It was emphasized by a couple of participants (N=2) that the fact that some parents insistently wanted their children to be taught at classes of the teachers who conducted different activities including the use of technology in education. On the other hand, the teachers resisting to innovation were not preferred by anyone, thus be considered "bad teachers". Statements of a participant about this topic are as follows:

> If an educator is open to change, s/he does not resist to it. However, if an educator is closed to change, s/he resists to every innovation. It is similar in case of technology, too. Of course, as we increased the number of technological devices at our school, the teachers willing to renew themselves started to use these tools straightaway. In the beginning, they had difficulty in it, but they developed themselves later on. However, some of teachers have never used the new technological tools at the school. As the achievement level increased in the classes where technology was used, teachers of these classes started to be preferred by both students and parents. Naturally, the teachers rejecting to use technology became isolated for a while. In a sense, they were excluded. They began to feel pressure on themselves (P6).

Lack of In-Service Training

Another research finding is that one of the challenges facing school principals in the context of technology leadership is lack of in-service training. All of the participants stated that they needed training about the use of technology in both administration and education, but they could not find any solution to this problem through their personal attempts. Some extracts from the interviews are as follows:

> Most of the teachers at my school -except for those who resist- try to use technology in their lessons. However, I have recently noticed that most of the teachers read the lesson content from a Word page or a presentation file reflected onto the curtain. I think this is not appropriate, but we do not know how to do it right as we have not been trained about the use of technology in education. I personally do not intervene in the subjects about which I have no idea. I cannot say to teachers that they misapply technology because I do not know the correct way. We need to receive training in this matter (P6).

> Firstly, I am not competent in the use of technology. I have attended computer courses several times, but the issue is not about the use of computer, it is about having knowledge about how to use technology in education. I am uneducated in this matter. Naturally, I cannot guide teachers. It should not be in this way, but we should be honest and tell the truth when required (P2).

Most of the participants (N=4) stated that the job of a school principal was very hard, they worked too much, they spent almost all of their time to solve a big number of problems at their schools, thus they failed to allocate time for their own personal development. Statements of a participant about this topic are as follows:

I cannot allocate time for improving myself due to heavy workload. There are so many problems at school. A big number of matters including violence between students, parental problems, and problems about physical structure of the school keep me busy.

I do not have enough time to deal with the educational process at the school. In this regard, I can say that I need to improve myself about not only technology, but also every topic about education. Training needs to be provided to us on this topic, and attending this training must be compulsory (P5).

All participants stated that especially the teachers needed to be educated in the context of technology leadership, but they did not have necessary skills on this topic. The participants highlighted that these kinds of skills could be acquired through either the personal efforts of teachers or in-service training activities. However, the participants told that the fewness of the number of in-service trainings to ensure professional development of teachers was an obstacle in front of the use of technology in education. Some extracts from the interviews are as follows:

> Unfortunately, we cannot do any planning about the training of teachers. However, these kinds of training activities can be conducted out of working hours if teachers are voluntary and can allocate time for them. It has not become possible up to now. Indeed, we are not authorized to conduct in-service training. It can be organized by the Ministry and the Provincial Directorates of National Education. The Ministry opens a limited number of in-service training courses. Voluntary teachers apply for these courses. There is no compulsory training. On the other hand, the number of training programs opened remains insufficient as there are hundreds of thousands of teachers in our country. The high number of personnel is a serious problem for us. There is no facility to provide in-service training (P4).

> I mostly want the teachers at my school to learn the new applications concerning the use of technology in education. However, there is not sufficient number of in-service trainings in this matter. A very limited number of in-service training courses are opened, and there are approximately 130,000 teachers in this city. The number of in-service training activities fails to fulfill the needs of such a large group of teachers. This situation inflicts a heavy blow in the development of teachers. Since our school does not have any budget, we cannot receive support from private companies, either. Consequently, we continue to work in this way (P2).

Poverty

The issue of poverty was emphasized by the school principals working in low-income areas (N=2). It was emphasized that poor families did not have facilities including computer, internet, etc., which prevented students from using technology outside the school. These participants also stated that limited and inadequate facilities at schools caused children to fall behind concerning the use of technology. Some extracts from the interviews are as follows:

> Poor families have neither a computer nor an internet connection. Children even do not have any room or table to study. Normally, we must be the party requesting something from them. However, it is they who always demand some things from us. Poverty is at the highest level. Conditions are quite limited. Teachers sometimes bring children to teachers' lounge or my room for them to benefit from computer. We try to provide as much service as possible through a limited number of computers (P1).

> Since most of the families are poor, they cannot purchase technological tools for school or their own children. In fact, they just try to survive because they have serious economic problems. It is even unfair to expect them to support their children. Only one or two of the students has a computer. Families invest in one or two cows, but they do not make any investment in their children. They may not have money for it. However, even when they have money, they do not spend it for education of their children (P2).

Discussion

Although technology leadership is defined within the scope of particular standards to be held by school administrators (NETS*A), the number of studies on this topic appears to be few in comparison to the developments in the use of technology in education (McLeod, Bathon, & Richardson, 2011). Particularly, the number of studies focusing on the challenges school principals facing in the context of technology leadership is rare in the field (Dawson & Rakes, 2003; Flanagan & Jacobsen, 2003; Leonard & Leonard, 2006; Nance, 2003; Richardson & McLeod, 2011; Schiller, 2003; Thomas & Kzenek, 1991; Wang, 2010) and this limitation generates a restriction for recommendations to be made and steps to be taken in this matter. Still, the findings obtained from these studies, which have been conducted in different educational environments, seem to support one another. On the other hand, even though these studies conducted in international contexts, they have similar results.

This study made an attempt to examine the challenges school principals facing in the context of technological leadership in the schools in Turkey. In the end, it was determined that school principals encountered five main challenges in the context of technology leadership. The first research result is that bureaucracy prevents school principals from integrating technology into schools, and restricts the movement area of school principals through different hierarchical practices. Among the complaints of school principals about bureaucracy is that demands concerning technologies needed in schools are ignored, delayed, and rejected in the bureaucratic process. This result shows parallelism with the results of the study conducted by Nance (2003). The second research result is that there is a lack of resources at schools that makes things difficult for the principals who want to integrate technology into schools. This result is parallel with the results of some studies conducted in international contexts (Leonard & Leonard, 2006; Richardson & McLeod, 2011; Thomas & Kzenek, 1991). Lack of a budget that can be directly used by the elementary schools within the body of the Ministry of National Education brings the fulfillment of the needs of schools only through parent-teacher associations and donations of parents. In fact, this situation can be considered a reflection of the structure of the Turkish National Education System when it is addressed together with bureaucracy. As a matter of fact, the Ministry of National Education, which intends to provide service by centralizing all authorities, controls innovations, and expenditures to be made in education. This can be regarded as the biggest obstacle in front of the school principals who want to make innovation-related decisions. The third research result is resistance to innovation. Especially the teachers with a long period of service resist to the use of technology in education, which adversely affects some teachers who are normally open to change. The resistance to innovation is the finding that shows most parallelism with the results of the studies conducted in international contexts (Dawson & Rakes, 2003; Leonard & Leonard; Richardson & McLeod; Wang). The fourth challenge facing school principals in the context of technological leadership is lack of in-service training. The number of in-service training activities to fulfill the needs of school principals and teachers concerning the use of technology in education is not sufficient, and the organized training activities have not a continuous nature. The fifth research result is about poverty. The biggest obstacle in front of the fulfillment of technology-related needs of the students attending schools in low-income areas is poverty.. Low-income families cannot provide their children with facilities including computer, internet, etc., and some schools currently do not have these kinds of facilities, either. Students have almost no opportunity to use technology, and school principals have difficulty in generating a solution to this problem. This result is similar to the results reported by Richardson and McLeod.

In conclusion, this study is considered to be significant in that it has determined the challenges school principals facing working within the scope of the Turkish National Education System in the context of technology leadership. Although the concept of technology leadership is accepted in the international context, the existence of a unique social structure, education system, thus different practices in every country causes school principals to encounter different challenges during activities carried out in the context of technology leadership. In this respect, the challenges faced in different countries should be evaluated under the circumstances of their unique contexts, and solution suggestions should be developed in this regard.

The present study has certain limitations due to the nature of research subject. The most important limitation is lack of diversity in terms of data collection tool, and the implementation of semi-structured interviews alone. Furthermore, the specific nature of the research subject has caused just a limited number of participants to be included in the research process. In this regard, a more comprehensive research can make a significant contribution to the literature.

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