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Technology readiness of primary school teachers: A case study in Turkey

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Abstract

The purpose of this paper is to assess the technology readiness of the primary school teachers in Gaziantep, Turkey. Also, the demographics of the teachers were examined to determine the effect of demographics on the technology readiness level. The Technology Readiness Index developed by Parasuraman was adopted to measure technology readiness of the teachers. Sample of study was 207 teacher in 11 different schools. The teachers' overall technology readiness level was moderate (mean: 2.96). There are no significant differences in terms of technology readiness acrosss age and subject area of the teachers but significant difference between technology readiness and gender.

Keywords: Technology Readiness Index; technology integration; teacher; primary school; Turkey.

1. Introduction

Since the beginning of the information age, ICT has maintained a crucial role in improving the quality of education. Policy makers recognize and realize the significance that ICT should be integrated in education systems (UNESCO, 2003). Integration of ICT into education is defined as using ICT effectively and efficiently in all dimensions of the educational process including the necessary infrastructure, curriculum and teaching-learning environments (Earle, 2002).

Integrating technology into teaching and learning is a complex process which requires readiness and may encounter a number of difficulties. These difficulties have been identified as lack of computers, lack of time, technical difficulities, poor funding, resistance to change, poor administrative support, low levels of computer literacy technology misaligned with the curriculum, lack of incentives, poor training opportunities, and lack of vision as to how to integrate technology into learning processes and, teacher related difficulities such as negative attitudes, beliefs and unwillingness towards technology (Hadley & Sheingold, 1993; Anderson et al.1998; Jacobsen, 1998; Ertmer et al., 1999; Beggs, 2000; Pelgrum, 2001;Snoeyink & Ertmer, 2002; Bariso, 2003). Indeed studies indicate that "teachers are more hesitant and less likely to embrace computer technology than other professionals" (Paprzycki &Vidakovic, 1994). And also some researchers believe that teachers play an important role in integrating

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technology into teaching and learning processes. Success of technology integration and effective use of technology in education mostly depend on teachers' willingness to adoption, and attitudes toward technology (Becker, 1994; Christiensen, 2002; Hew & Brush, 2007; Jacobsen et al. 2002; Yıldırım, 2007). In other words, teachers' embrace, and willingness to adopt, directly affect their success in technology readiness and integration. At this point, the concept of technology readiness needs to defined; the technology-readiness is a construct which refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work (Parasuraman, 2000). The construct can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's tendency to use new technologies (Parasuraman, 2000).

The TRI (Technology Readiness Index) identifies four dimensions of technology belief that impact an individual's level of techno-readiness (Elliott et al., 2008).

1. Optimism: A positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.
2. Innovativeness: A tendency to be a technology pioneer and thought leader.
3. Discomfort: A perceived lack of control over technology and a feeling of being overwhelmed by it.
4. Insecurity: Distrust of technology and skepticism about its ability to work properly.

Of these four dimensions, optimism and innovativeness are drivers of technology readiness, whereas discomfort and insecurity are inhibitors (Parasuraman, 2000).

Technology readiness has emerged from studies of how new technologies are adopted. This work began with studies of telecommunications technologies (Parasuraman, 2000). The technology readiness concept are widespread, particularly in the business marketing domain where research focuses on identifying segments of the market who are likely to adopt new technologies such as mobile data services (Massey et al., 2005), distance education (Hendry, 2000), and online insurance (Taylor et al., 2002), among others. In each of these studies, the authors found the technology readiness model to be effective for studying respondents' propensity to adopt new technologies (cited in Caison et al., 2008).

The TRI can be used to assess the technology readiness of employees (i.e. teachers). As in the case of external customers, gaining a good understanding of the technology readiness of employees is important for making the right choices in terms of designing, implementing, and managing the employee-technology link (Parasuraman, 2000).

Parallel to international interests in educational technology, ICT in education were emphasized in national planning documents in Turkey. Some objectives regarding education system in the Ninth Development Plan indicate strengthening ICT infrastructure in schools and developing methods for supporting to use ICT in classrooms (The Offical Gazette, 2006). The MoNE (Ministery of National Education) has financed number of projects to achieve technology integration in educational settings in Turkey. The first one, Computer-Aided Education (CAE) Project was started in 1984. Later, MoNE continued to execute other projects such as **"**Catching the Epoch 2000", "Improving the National Education" supported by World Bank, "Basic Education Project, Phase-I" and **"**MoNE Internet Access Project". Within the scope of these projects, 2837 technology classrooms were established in 2451 schools. And about 50.000 computers were offered at a special rate for administrators students, and teachers at schools. And also at the enf of 2008, approximately 38.000 school computers have been connected to Internet via broad-band connection (MoNE, 2009a; MoNE, 2009b). These projects and objectives show that MoNE attaches importance to the integration of ICT into education.

Altough there are some ongoing projects and national objectives in Turkey, technology integration has not been taken into consideration by researches (Cavas et al., 2009). In the scope of technology readiness literature, there are not enough studies about teachers' technology readiness both in international and dometstic literatures. Therefore this study is important in creating a general awareness and this way, contributing to the related literature.

The main aim of this study was to find out technology readiness level of Turkish primary school teachers in the province of Gaziantep, then identify the relationship between teachers' technology readiness level and their demographic variables such as gender, age, and subject matter specialization .

2. Method

Quantitative descriptive method was used in this study. The target population for this study was Turkish primary school teachers during the school year 2009-2010. Randomly selected 11 primary schools were used to obtain data from 207 teachers in city of Gaziantep . An official permission was attained from the Turkish MoNE and the

questionnaires were officially posted to schools by the Provincial Directorate of National Education in Gaziantep. The questionnaires were administered to 250 teachers in selected schools and 207 questionaries (return rate of 83 %) were valid.

A 36-item TRI was used in this study with written permission of A. Parasuraman and Rockbridge Associates, Inc., 1999. TRI was adapted into Turkish language-translation, reverse translation,and reliability analyses. The translation process was performed Turkish Phd. students has perfect English. In order to analyses reliability, cronbach alpha coefficients were calculated. The scale was high coefficient alpha score .73.

The TRI is a Likert type scale with responses ranging :

- Strongly disagree (1): mean values between 1.00 and 1.80
- Disagree(2): mean values between 1.81 and 2.60
- Undecided(3): mean values between 2.61 and 3.40
- Agree(4): mean values between 3.41 and 4.20
- Strongly agree(5): mean values between 4.21 and 5.00

The data collected were analyzed in SPSS 14.0 for Windows. Mean scores, and standard deviation for all respondents were calculated for each of the four dimensions of the TRI scale. Also, t-test and one-way anova were conducted to assess significance differences in terms of gender, age, and subject area across the four TRI dimensions. A level of 0.05 was established a priori for determining statistical significance. Discomfort and insecurity components' scores were reversely coded due to the negative meaning of their statements.

3. Results

Table 1 shows the profile of the participants in this study. The 55.1% of the subjects were male (n=114) and 44.9% were female (n=93). In terms of the age variable, 34.3% of the subjects was between 31 and 37 years-old. 7.2% of teachers were 52 years-old or over. Most of the teachers (67.6%) were in social sciences (n=140). Only 8.2% of the teachers' were of foreign languages origin.

Table 1. Demographic Profiles of the Particapants

	Frequency	Percent(%)
Genders		
Female	93	44.9
Male	114	55.1
Ages		
≤30	49	23.7
31-37	71	34.3
38-44	46	22.2
45-51	26	12.6
≥52	15	7.2
Subject Areas		
Social Sciences	140	67.6
Mathematical Sciences	32	15.5
Arts and Phisical Education Fileds	18	8.7
Foreign Languages Fields	17	8.2

In table 2, mean scores of each dimension of TRI were shown. Optimism was rated with the highest mean score of 4.17. The next highest dimension was innovativeness (3.28). These were drivers of TRI. It means that optimism and innovativeness dimensions positively affect TRI. In the mean time teachers' optimism level was found to be higher than their innovativeness.

Table 2. The obtained mean Scores on the TRI Dimensions

Dimen ions	N ean	Standard Devia ion (SD)
Optimism	4.17	.53
Innovativen ss	3.28	.76
Discomfort	2.13	.59
Insecurity	2.26	.47
TRI(Overall	2.96	.37

As we looked at discomfort and insecurity dimensions, inhibitors of TRI in table 2, mean value of insecurity dimension (2.26) was higher than discomfort (2.13). Mean of all dimensions of TRI, overall, was 2.96. This value indicated that the participants' technology readiness level was moderate.

Table 3.Independent-Samples t- test: Between Dimensions of TRI and Gender

Dimensio ıs	t	Sig. (2 -tailed)	] lean Di 'erence	Sto Error Di 'erence
Optimism	-2.264	**.025**	-.16604	.07335
Innovativ ıess	-2.775	**.006**	-.29179	.10513
Discomfo :	-1.854	.065	-.15160	.08178
Insecurity	.082	.935	.00526	.06441
TRI(overa l)	-2.958	**.003**	-.15104	.05106

p<.05

An independent-samples t-test was conducted to compare level of technology readiness of teachers in terms of gender. As seen in table 3, there was significant difference in scores for female and male teachers. For the dimensions, we found significant difference in optimism, innovativeness, and overall TRI whereas we did not find any significant difference in discomfort, and insecurity.

In this case, males reported a significantly higher mean value for optimism, and innovativeness than females. Male teachers also demonstrated a significantly higher overall technology readiness score than female teachers.

Table 4.One-way Anova: Between Dimensions of TRI and Age and Subject Area

	Age		Subject Ar(a	
Dime sion	F	Sig.	F	Sig.
Optimism	.57	.67	.10	.95
Innovative ess	1.1 3	.34	.33	.79
Discomfor	.26	.89	1.3 4	.24
Insecurity	.60	.66	1.1 3	.31
TRI(Overa l)	.51	.72	.56	.64

p>.05

One-way Anova was used to explore relationships between the dimensions of technology readiness and variables of age and subject area. As seen table 4, no significant relationship was found between the four dimensions of technology readiness and these two variables.

4. Discussion and Conclusion

Integrating ICT into all educational process is very important for education systems in these days. In Turkey, MoNE has allocated and spent budget to support technological infrastructure for ICT integration into education.

While integrating technology into education, some critical factors were focused. Teachers, one of the critical factors in technology integration, play important role in ICT integration. Their attitudes, beliefs, perceptions, and behaviors toward technology are considerable.

This research aims to measure teachers' technology readiness by using TRI. TRI which is a scale consists of four dimensions: optimism, innovativeness, discomfort, and insecurity.

As a result of this study, the teachers' optimism level was higher than their innovativeness, and mean value of insecurity dimension was higher than discomfort. And also the participants' technology readiness level was moderate. A TRI researches was performed to assess TRI of the managers of Malaysian construction companies. In this study, the overall TRI score of participants 3.18. (Jaafar et al., 2007) This value very closed to mean score of overall TRI obtained our study (2.96). In the same study, Mean value of optimism (4.11) was higher than innovativeness (3.51). This result also was consistent with our finding. In some researches reported that attitudes of teachers' toward technology were favorable (Ozgen & Obay,2008; Deniz, Gorgen & Seker, 2006).

In terms of demographic variable, age and subject area, there was no significant difference between technology readiness of participants and these demographics. Some studies reported that there is no significant difference between attitudes and age (Woodrow, 1992; Handler, 1993).

But only significant difference was found in gender. Male teachers demonstrated a higher overall technology

readiness score than female teachers. Similarly, some studies indicated that male teacher' attitudes toward computer technology more positive than females (Dupagne, & Krendi, 1992; Ertmer et al., 1999).

In conclusion, this study showed that teachers' technology readiness level was not high. This can cause some problems in the integration process. We recommend that ministerial, local, and school level administrators should design some activities to increase teachers' readiness of technology. These can contribute the success of technology integration and may contribute to the quality of education.

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