

Research Article

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Self-Efficacy of the Social Studies Teachers in Using the Interactive Whiteboards*

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Abstract

The aim of this study is to analyse the self-efficacy of the social studies teachers in regard to the use of smart whiteboards. In the study the self-efficacy of the social studies teachers in regard to the use of smart boards was examined based on some variables (i.e., gender, age and receiving training on the use of information technologies). The study was designed according to the survey design and the participants were 101 social studies teachers working at public secondary schools in Afyonkarahisar province of Turkey. The data of the study were collected using the Self-Efficacy Scale in Using the Interactive Blackboard developed by Yalçınkaya and Özkan (2014). The data collected were analysed with the descriptive statistics, independent group's t Test and one-way analysis of variance. The findings indicate that the self efficacy of the social studies teachers participated in the study was at the level of "agree" suggesting that they perceived themselves competent in using the interactive blackboard. It was found that their self-efficacy in using the interactive blackboard did not vary based on the variables of gender and age, but prior training on information technologies had positive effects on their self-efficacy in using the interactive blackboard.

Keywords

Smart/Interactive whiteboard; Self-Efficacy; Social Studies Education

In our time it has become very important to reach the information in the shortest and fastest way. In line with this situation many projects in different countries are being

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implemented to employ the information technologies in educational settings and to integrate such technologies into educational process. Previously some educational materials such as chalkboard, books and maps were employed in the educational process. However, these materials are now being replaced by information technologies. Through projects as mentioned above, schools have had high-level access to information and communication technologies, such as interactive boards, tablets, laptops, projectors, and software, Internet infrastructure and various equipment (Koçak, 2013; Falloon, 2015; MoNE, 2017; Pamuk, Çakır, Ergun, Yılmaz and Ayas, 2013). Such changes and developments in educational technologies have created new attitudes, new functions and roles for teachers and increased their importance in the teaching process. In order to meet the needs of the information societies and to prepare our students better for the future, it is necessary to educate them well on how they will learn, how they will think and how they will use the necessary educational technologies. Teachers' ability to perform their duties effectively in teaching processes depends on their competences. More qualified students can be educated as teachers' competencies increase (Gözütok, 1995; Mentiş - Taş, 2004).

The use of technology in the education and learning process improves the quality of education, student attendance and persistence of knowledge. Therefore, both teachers and students should be competent in using educational technologies. Such competency makes it possible to easily learn and evaluate the information given in school and to utilize this new information gained in school life (Boyraz, 2008; Akkoyunlu, 2002). Educational technology has many positive effects such as supporting individual learning, increasing interest in the course and facilitating teaching (Lortoğlu, 2008). The use of technology in education helps students and teachers in the learning process, prioritizes the student and positively affects students' learning according to their individual learning styles. It also makes it possible to repeat the topics to be taught whenever it is necessary and to offer individual studying opportunities to students which may produce the desired level of student achievement. In addition, it contributes positively to students' thinking skills and helps students to learn by understanding and understanding instead of memorizing information (Taşlibeyaz, 2010; Atman, 2005).

When educational technologies are used, students can easily reach knowledge which improves learning. In order to increase the level of learning, educators should pay attention to the use of those learning and teaching materials that bring the students to the forefront while preparing the course materials. In order to realize an effective learning, it is necessary to use various software and hardware and to make information concrete. In addition, teachers should have a positive attitude towards technology due to the fact that it allows for using several teaching-learning activities and games. They should also have necessary knowledge and skills about the educational materials. Teachers should therefore be trained in the use of modern technologies in educational settings (Yalçınkaya and Özkan, 2014; Zengin, Kırılmazkaya and Keçeci, 2011; Cavas et. al., 2009).

One of the earliest examples of the use of technology for educational purposes was computer aided education. Following this approach the use of technology for educational purposes became much more widespread. Following the widespread use of various

technological tools and materials in the classroom, at the beginning of the 1990s interactive whiteboards began to be used (Şad, 2012). Interactive or smart whiteboards are one of the educational equipment which include the functions of many different materials and tools, the course content covered addresses different senses of students and teachers may access various distinct sources through a single touch (Qirim, 2011; Erduran and Tataroğlu, 2009). Using the touch screen both teachers and students may intervene and make changes in course delivery and problem solving. Another point is that topics are made concrete through sounds and animations and emphasizing the significant sections (Lewin, Somekh and Steadman, 2008). Therefore, the smart whiteboards which support distinct techniques improve the motivation of the students and their attention and also, student achievement by making the lessons more enjoyable and interesting (Barak, 2007; Levy, 2002). In addition, it makes it possible to have Internet access to find further written and visual sources about the courses and for teachers to save the course notes for future uses. Teachers may use these saved notes with students who may use them later if they could not attend courses or if they want to repeat the course content (Starkings and Krause, 2008).

The importance of educational technologies has increased. In Turkey there are some initiatives to integrate technology into education. The FATİH Project (which is Turkish abbreviation of ‘The Action for Increasing Opportunities and Improvement of Technology’) initiated by the Ministry of National Education (MoNE) in Turkey increased the use of smart whiteboards at schools. On the other hand, the skills part of the education program for the social studies courses was expanded to include digital literacy and search skills using technological devices. One of seven learning domains for the social studies courses is stated as science, technology and society. In addition, one of the particular goals of the program is to make students recognize the development process of science and technology and its effects on social life and to consciously use the information and communication technologies.

Although there are many studies on the use of smart whiteboards, it is only in recent period that such studies have increased in Turkey. Most of the latter studies are generally about the views of the students about the smart whiteboards and the effects on students (Kefeli, 2013). There are not enough studies on teacher competency which is very important for the successful use of smart whiteboards in educational environments. (Yalçınkaya and Özkan, 2014; Doğan-Yılmaz, 2014; Kocaoğlu and Akgün, 2015; Betoncu, 2017). This study specifically attempts to fill the gap through the analysis of self-efficacy of social studies teachers in using smart whiteboards. Therefore, the aim of this study is to analyse the self-efficacy of the social studies teachers in regard to the use of smart whiteboards. In line with this aim, the study attempts to answer the following research questions:

- 1) What are the self-efficacy levels of social studies teachers in using the smart whiteboards?

2) Does the self-efficacy level of social studies teachers in using the smart whiteboards significantly differ by gender?

3) Does the self-efficacy level of social studies teachers in using the smart whiteboards significantly differ by age?

4) Does the self-efficacy level of social studies teachers in using the smart whiteboards significantly differ by the factor of receiving or not receiving training on information technologies?

Method

The study which aims at analysing the self-efficacy of the social studies teachers in regard to the use of the smart whiteboards is designed based on the survey design which is part of descriptive research types. This model is a model where a group of the community is selected as a working group to describe the characteristics of a large community, such as a topic or event, or features of interest, skill, ability, attitude, etc. and where the data of the research are based on the answers of these participants (Fraenkel and Wallen, 2006). The individuals, objects or events to be analysed are described in their own conditions (Karasar, 2012).

Participants

The participants of the study were 101 social studies teachers working at public secondary schools in Afyonkarahisar province during the school year of 2016-2017. Of 101 participants 59 were female and 42 male. Some personal information about the participants is given in Tablo 1.

Table 1

Personal Information about the Participants

Gender	n	%
Female	59	58,4
Male	42	41,6
Age		
25 and younger	22	21,8
26-30	29	28,7
31-35	30	29,7
36 and older	20	19,8
Prior training on information technologies		
Yes	78	77,2
No	23	22,8
Total	101	100

Data Collection Tool

The data of the study were collected using the Self-Efficacy Scale in Using the Interactive Blackboard developed by Yalçınkaya and Özkan (2014). The scale is consisted of 23 items and five factors. These factors are as follows: “use”, “competency”, “problems and solutions”, “use in different settings” and “learning”. The answers to the

items are given on a 5-point likert type scale: completely agree (5), agree (4), no idea (3), disagree (2), and completely disagree (1). All items in the scale are positive statements. The original Cronbach alpha coefficient of the scale was reported to be 0.94. In the current study the Cronbach alpha coefficient of the scale is found to be 0,97.

Data Collection and Data Analysis

In analysing the self-efficacy of the participants in using the smart whiteboards the arithmetic mean and standard deviation values based on their scores from the Self-Efficacy Scale in Using the Interactive Blackboard. The t-test for independent groups and one-way analysis of variance were used to analyse whether or not gender, age and prior training on information technologies created any significant effect on their self-efficacy in using the smart whiteboards. The significance level was set at .05. A statistical package program was used in all statistical analyses.

Findings

Findings on the Self-Efficacy Levels of the Social Studies Teachers in Using Smart Whiteboards

The scores of the social studies teachers participated in the study from the scale of the self-efficacy in using the smart whiteboards were analyzed. In the analysis the arithmetic means of their scores from the scale was employed. The results of the analysis are given in Table 2.

Table 2

Results of the Participants' Scores from the Scale of the Self-Efficacy in Using the Smart Whiteboards

Scale of the self-efficacy in using the smart whiteboards	N	X	Sd	Min.	Max.
General	101	3,754	0,811	1,480	4,960
Use	101	3,770	0,867	1,400	5,000
Competency	101	3,726	0,886	1,000	5,000
Problems and solutions	101	3,795	0,836	1,330	5,000
Use in different settings	101	3,670	0,964	1,000	5,000
Learning	101	3,786	0,890	1,000	5,000

As can be seen in Table 2 the mean self-efficacy score of the participants in regard to the use of smart whiteboards is 3.754. Therefore, the self efficacy of the social studies teachers participated in the study was at the level of “agree” suggesting that they perceived themselves competent in using the interactive blackboard. The mean scores for the dimensions of the scale are found to range between 3,795 and 3,670. The lowest mean score was for the dimension of the using smart whiteboards in different settings ($X=3,670$). The highest mean score is found for the dimension of “problems and solutions” ($X=3,795$).

Findings on the Self-Efficacy Levels of the Social Studies Teachers in Using Smart Whiteboards by Gender

The effects of gender on the self-efficacy mean scores of the participants in using the smart whiteboards were analysed through the t-test for independent samples. The results of the analysis are given in Table 3. More specifically, it shows the mean scores of the participants based on gender for both the scale as a whole and for the dimensions of the scale.

Table 3

Results of the Participants' Scores from the Scale of the Self-Efficacy in Using the Smart Whiteboards by Gender

Scale of the self-efficacy in using the smart whiteboards	Group	N	X	Sd	t	p
General	Female	59	3,643	0,823	-1,642	0,104
	Male	42	3,910	0,777		
Use	Female	59	3,654	0,867	-1,606	0,111
	Male	42	3,933	0,852		
Competency	Female	59	3,610	0,845	-1,570	0,120
	Male	42	3,889	0,926		
Problems and solutions	Female	59	3,706	0,873	-1,274	0,206
	Male	42	3,921	0,774		
Use in different settings	Female	59	3,492	1,018	-2,248	0,027
	Male	42	3,921	0,832		
Learning	Female	59	3,718	0,868	-0,909	0,366
	Male	42	3,881	0,922		

Table 3 indicates that the self-efficacy mean scores of the female participants in using the smart whiteboards ($X_{59}=3,643$) is lower than those of the male participants ($X_{42}=3,910$). However, it is found that this difference is not statistically significant. Therefore, it can be argued that the self-efficacy mean scores of the participants in using the smart whiteboards do not differ by gender [$t(-1,642) = 0,104, p>.05$] and that gender is not a significant variable in terms of the self-efficacy in using the smart whiteboards.

The same result was also found for the dimensions: Use [$t(-1,606) = 0,111, p>.05$], competency [$t(-1,570) = 0,120, p>.05$], problems and solutions [$t(-1,274) = 0,206, p>.05$] and learning [$t(-0,909) = 0,366, p>.05$]. In other words, the mean scores for these dimensions are found not to be significantly affected by gender. However, the mean score of the male participants for the dimension of using the smart whiteboards in different setting ($X_{42}=3,921$) is higher than the female participants ($X_{59}=3,492$). This difference is found to be statistically significant [$t(-2,248) = 0,027, p<.05$]. On the other hand, the self-efficacy levels of both male and female participants are at “agree” level.

Findings on the Self-Efficacy Levels of The Social Studies Teachers in Using Smart Whiteboards By Age

The effects of age on the self-efficacy mean scores of the participants in using the smart whiteboards were analysed through the one-way analysis of variance. The results of the analysis are given in Table 4.

Table 4

Results of the Participants' Scores from the Scale of the Self-Efficacy in Using the Smart Whiteboards by Age

Scale of the self-efficacy in using the smart whiteboards	Group	N	X	Sd	F	p
General	25 and younger	22	3,818	0,521	0,532	0,661
	26-30	29	3,846	0,856		
	31-35	30	3,746	0,857		
	36 and older	20	3,563	0,951		
Use	25 and younger	22	3,855	0,691	0,243	0,866
	26-30	29	3,752	0,911		
	31-35	30	3,813	0,879		
	36 and older	20	3,640	1,000		
Competency	25 and younger	22	3,788	0,722	0,265	0,851
	26-30	29	3,810	0,962		
	31-35	30	3,678	0,894		
	36 and older	20	3,608	0,966		
Problems and solutions	25 and younger	22	3,977	0,607	1,428	0,239
	26-30	29	3,914	0,845		
	31-35	30	3,744	0,853		
	36 and older	20	3,500	0,978		
Use in different settings	25 and younger	22	3,652	0,488	1,024	0,386
	26-30	29	3,874	0,998		
	31-35	30	3,678	1,070		
	36 and older	20	3,383	1,125		
Learning	25 and younger	22	3,667	0,823	0,505	0,680
	26-30	29	3,908	0,890		
	31-35	30	3,844	0,852		
	36 and older	20	3,650	1,040		

As can be seen in Table 4 the mean self-efficacy scores of the participants based on age groupings range between 3,846 and 3,563. The lowest mean self-efficacy score was found for the group of 36 and older age. However, it is found that the differences in the mean self-efficacy scores of the participants based on age groupings are not statistically significant for the scale and its dimensions ($p > 0.05$).

Findings on the Self-Efficacy Levels of the Social Studies Teachers in Using Smart Whiteboards Based On Prior Education on Communication Technologies

The effects of prior training on information technologies on the self-efficacy mean scores of the participants in using the smart whiteboards were analysed through the t-test for independent samples. The results of the analysis are given in Table 5.

Table 5

Results of the Participants' Scores from the Scale of the Self-Efficacy in Using the Smart Whiteboards Based on Prior Education on Communication Technologies

Scale of the self-efficacy in using the smart whiteboards	Group	N	X	Ss	t	p
General	Yes	78	3,858	0,747	2,422	0,017
	No	23	3,403	0,934		
Use	Yes	78	3,823	0,831	1,128	0,262
	No	23	3,591	0,981		
Competency	Yes	78	3,846	0,798	2,580	0,011
	No	23	3,319	1,055		
Problems and solutions	Yes	78	3,927	0,755	3,038	0,003
	No	23	3,348	0,956		
Use in different settings	Yes	78	3,774	0,945	2,017	0,046
	No	23	3,319	0,967		
Learning	Yes	78	3,885	0,802	2,096	0,087
	No	23	3,449	1,095		

Table 5 indicates that the mean self-efficacy scores of the participants who received training on information technologies ($X_{78}=3,858$) are much higher than those of the participants who did not receive such an education ($X_{23}=3,403$). It was found that this difference is statistically significant [$t(2,422) = 0,017, p < .05$]. Therefore, it is possible to argue that prior training is one of the significant factors in terms of the self-efficacy in using the smart whiteboards. In addition, the mean scores of the following dimensions are found to be significantly affected by the prior training on information technologies: competency [$t(2,580) = 0,011, p < .05$], problems and solutions [$t(3,038) = 0,003, p < .05$] and the use of the smart whiteboards in different settings [$t(2,017) = 0,046, p < .05$]. However, the mean scores for the following dimensions are found not to be affected by the prior education on communication technologies: Use [$t(1,128) = 0,262, p > .05$] and learning [$t(2,096) = 0,087, p > .05$].

Conclusions and Discussion

The study examined the self-efficacy of the social studies teachers in regard to the use of smart whiteboards. The findings indicate that the self efficacy of the social studies teachers participated in the study was at the level of “agree” suggesting that they perceived themselves competent in using the interactive blackboard. This findings is

similar to those found in the studies by Akkoyunlu, Orhan and Umay (2005), Yalçinkaya and Özkan (2014), and Doğan-Yılmaz (2014). Yalçinkaya and Özkan (2014) also found that the self efficacy of the participants was at the level of “agree” suggesting that they perceived themselves competent in using the interactive blackboard. Similarly, Doğan-Yılmaz (2014) found that the self efficacy perceptions of the secondary school teachers participated in the study were at the medium level. Therefore, they perceived themselves generally competent in using the smart whiteboards. In addition, Orhan and Umay (2005) concluded that pre-service computer education teachers had very high levels of self-efficacy in using the smart whiteboards.

The self-efficacy mean scores of the female participants in using the smart whiteboards ($X_{59}=3,643$) is lower than those of the male participants ($X_{42}=3,910$). However, it is found that this difference is not statistically significant. This finding is similar to the previous findings reported by Doğan-Yılmaz (2014), Kocaoğlu (2013) and Şensoy (2004). Doğan-Yılmaz (2014) found that there was no significant differences between the mean self-efficacy scores of male and female secondary school teachers. Similarly, Kocaoğlu (2013) concluded that there was no significant differences between the mean self-efficacy scores of male and female high school teachers. In addition, Şensoy (2004) argued that self-efficacy of the teachers in relation to computer use did not significantly differ by gender. However, Yalçinkaya (2013) found that the self-efficacy of the male teachers in using interactive whiteboards was much higher than that of the female teachers.

The mean self-efficacy scores of the participants based on age groupings range between 3,846 and 3,563. However, it is found that the differences in the mean self-efficacy scores of the participants based on age groupings are not statistically significant for the scale and its dimensions. This finding is similar to those reported in the studies by Doğan-Yılmaz (2014) and Koçak (2013). Doğan-Yılmaz (2014) found that there was no significant differences between the mean self-efficacy scores of younger and older secondary school teachers. Similarly, Koçak (2013) concluded that there was no significant correlation between teachers' age and their attitudes. However, Yalçinkaya (2013) argued that there was a significant correlation between the self-efficacy of secondary school teachers in using the interactive whiteboards and their age.

The mean self-efficacy scores of the participants who received training on information technologies ($X_{78}=3,858$) are much higher than those of the participants who did not receive such training ($X_{23}=3,403$). It was found that this difference is statistically significant. The findings reported by Doğan-Yılmaz (2014) were similar to the findings of the present research. More specifically, Doğan-Yılmaz (2014) found that the self-efficacy of the secondary school teachers in regard to the use of interactive whiteboards improved after they attended in-service training activities on the use of the communication or educational technologies. However, Sağlam (2007) found that prior education on communication technology did not have a significant effect on the participants' self-efficacy in using it in educational settings.

Based on the findings of the research, the following suggestions have been made:

1. This study is based on a sample of secondary school teachers. Similar studies can be conducted with teachers working at the high school and higher education levels.
2. In-service trainings may be organized concerning the use of the smart boards.
3. Materials and educational software can be developed for teachers from different educational levels.
4. Teacher training programs may include courses about the use of smart whiteboards.

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