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INVESTIGATING HOW TEACHERS IN PRIMARY SCHOOLS IN SAUDI ARABIA WERE TRAINED TO USE INTERACTIVE WHITEBOARDS AND WHAT THEIR TRAINING NEEDS WERE

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***Abstract*— The aim of this paper is to present some of the quantitative findings from a PhD study related to teachers' training in using IWBs in primary schools which participated in *Tatweer* project in the city of Jeddah, in Saudi Arabia. Therefore, this paper concentrates on investigating how Saudi teachers in primary schools were trained to use IWBs and examines gender differences, extent of training, the types of training they need, and their training preferences. The sample of this study consisted of 587 teachers (286 males and 301 females) from primary *Tatweer* schools in the city of Jeddah during the academic year 2014-2015. The quantitative findings of this study indicated that the lack of providing training courses to Saudi teachers had an important effect on their IWB skills and satisfaction about their level of training, leading them to depend on themselves or their colleagues to improve their capabilities. Moreover, training in both technical and pedagogical skills as well as providing support from the school administration is essential for effective integrating of IWBs in classrooms. Female teachers' responses in this study indicated greater need for training in effective teaching techniques using IWBs and greater preference for self-training methods than males.**

***Keywords*— Interactive Whiteboards; Saudi teachers; Teachers' training; *Tatweer* project.**

I. INTRODUCTION

The presence of Interactive whiteboards (IWBs) in schools has encouraged many researchers to examine their effects on instruction and learning processes [1]. Therefore, there are many studies that have examined the usage of IWBs in the classroom and their effects on education [2]. IWBs have a number of advantages agreed in the literature for both educators and learners. According to Glover, Miller, Averis, and Door [3], although teachers may take longer to arrange their lessons by using IWBs, the positive effects of using IWBs in teaching and learning process are valuable. IWBs increase students' motivation and focus, introduce different learning methods whether visual or audio, enable importing various resources, offer greater lesson planning, and present learning resources obviously [3]. The effective use of IWBs requires educators to understand the methods of interactive teaching by using technology to have remarkable effects on student learning. However, this needs more appropriate training courses for teachers that focus on changing their pedagogy [2]. Nevertheless, if there were no provision of these courses, the outcome could be very unsatisfactory [2]. Moreover, previous studies have indicated that instructive innovations failed when educators have not been supported with suitable skills to use them effectively [4]. Therefore, teachers need continuing professional development (CPD) to ensure their growth and improvement. Importantly, it is important to connect professional development programs with students' syllabus, effective teaching strategies, teachers' real needs, and school objectives to improve CPD programs in Saudi schools. However, according to Alharbi [5], "professional development programs in Saudi Arabia are designed nationally and delivered through Local Education Authorities (LEAs) with an absence of the voice of others."(p. 53).

Thus, the views of teachers in Saudi schools towards their current skills and their real needs should be investigated to support the design of successful training courses relating to the use of IWBs. There are only a few studies that have investigated IWBs in Saudi Arabia [6; 7; 8; 9; 10; 11]. All these studies agree about the limited skills of Saudi teachers in using this technology. However, no single study has investigated how Saudi teachers have been trained to use IWBs, what are their sources of training, their satisfaction about their training, their training methods preferences, and

their IWB training needs, therefore, this calls for a study that aims to contribute to this field by adding new knowledge in this area and fill the gap in Saudi literature specifically and the international literature more broadly.

Moreover, several educational studies relating to IWB technology [12;13;14] investigated students' gender differences and other studies [15;16] examined teachers' gender differences regarding their attitudes towards using IWBs. However, there are a lack of studies that investigate teachers' gender differences, in relation to the number of training courses, the types of training they need, and their training methods preferences. Thus, this study contributes to filling this gap in the literature. Especially, the educational system in Saudi Arabia is only based on single-sex schools and therefore, there are separate and different training courses for male and female teachers with different coaches.

In 2007, a large-scale project called the King Abdullah Project for General Education Development (*Tatweer* project) was launched aiming to improve education in public schools in Saudi Arabia. This project aims to train teachers in Saudi schools through improving continuing professional development programs. However, teachers' training can either meet the real needs of teachers or fail to reach these needs and consequently, increase their dissatisfaction and prevent them from improving their skills effectively [17]. Therefore, the views of teachers in Saudi schools towards their current training and their real needs should be accurately investigated for designing successful training courses relating to the use of IWBs.

II. The Importance of Training Teachers to Use Interactive Whiteboards

The professional development of teachers is an important factor to ensure the production of active lessons [18]. Professional development programs enhance teachers' satisfaction and consequently increase their desire for teaching [19]. They are also considered an important factor that help schools in improving the quality of teaching and learning [20] and that because they increase teachers' confidence, skills, and enjoyment [21]. Many opportunities can be offered to teachers when new technologies introduced in classrooms, and this can lead to enhancing their teaching abilities as well as improving their creativity [22]. However, incorporating new kinds of technology into classrooms is regarded as a vital issue for all teachers in the twenty-first century [23]. Therefore, it is essential to examine precisely the professional development of teachers and how this relates to technology [24]. Indeed, training courses act as a moderator that aids educators to be autonomous and self-guided learners, so developing their IWB skills and gaining in confidence with this technology [25].

There is no doubt that introducing innovative technologies in schools could create conflict and problems, and consequently instructors and learners could be affected [26]. Therefore, providing educators with appropriate skills and approaches to face technology obstacles is essential for more effective use of technology [27]. Teacher training should be considered when using IWBs to improve the quality of their teaching [28].

Educators should have suitable technical and pedagogical skills in using IWBs in classrooms to enhance their performance [29]. Therefore, they need more than installing IWBs in their classrooms; they need adequate training and support [30]. When educators have suitable training, they can integrate IWBs into their lessons to improve the value of interactions in classrooms [30]. Moreover, communal preparation time with colleagues could be essential in the effective use of the technology [31]. Shenton and Pagett [32] conducted a study that aimed to explore the use of IWBs in the UK. The results of this study indicated that self-training and collaborating with colleagues were the most appropriate teacher training sources, and they could be more efficient factors in improving teachers' skills for best use of IWBs. In contrast, a study carried out by Turel and Johnson [33] revealed that most educators (67%) gained their training by the educational institution or by the provider of IWBs. The lower percentage (26%) of teachers were self-trained. However, Higgins, Falzon, Hall, Moseley, Smith, Smith, and Wall [12] conducted a study to evaluate the UK's pilot project (*Embedding ICT in the Literacy and Numeracy Strategies*), where IWBs installed in more than 80 primary schools in England. This study showed that 81% of the instructors had trained via their colleagues and by their local IWB consultants. Furthermore, training courses were the most common IWB training sources for the majority of teachers (86%) in this project (ibid.).

To sum up, the necessity for continual, cooperative training is not only required for basic use, but is also needed to develop the full potential of IWBs, as well as it should concentrate on improving teachers' effectiveness [34]. However, educators lack technical and instructional abilities for more active use of IWBs, despite their constant training [35]. Additionally, educators frequently lack training courses from providers and these courses only focus on the basic skills of IWBs [36].

III. The King Abdullah Project for General Education Development (*Tatweer* project)

In 2007, the Saudi Council of Ministries launched a large-scale project called the King Abdullah Project for General Education Development (*Tatweer* project). The budget of this project was approximately SR 9 billion [37] which is equivalent to $ 2.4 billion and £1.5 billion. The planned duration of this project was six years from 2007 to 2013 [37]. Interestingly, in 2014 King Abdullah supported this project with SR 80 billion (which is equivalent to approximately £13.5 billion) to improve Saudi public schools in the next five years [38].

This massive project aimed to improve the quality of education at all levels of public schools in all cities in Saudi Arabia to meet the requirement of the 21st century. It focused on five critical areas which are: 1) training Saudi educators through improving the regular professional development programs in order to successfully accomplish their tasks in

classrooms; 2) developing educational curricula to be more suitable for social, mental, psychological, and the needs of students; 3) improving learning environment in all Saudi schools to motivate students and achieve high scores; 4) employing ICTs for increasing the quality of learning and teaching processes; and 5) supporting students' extracurricular activities aiming to improve their creativity, self-confidence, and social skills. The environment in classrooms has been enhanced by introducing modern technologies such as IWBs, demonstrating technologies, communications systems, and web services [39]. With regard to educator training, *Tatweer* project has several goals which are: introducing suitable training courses for all teachers, arranging for providing computer knowledge learning for educators as well as training them in integrating technology effectively in teaching, and preparing high skilled trainers [37].

Fifty Saudi secondary schools (25 male schools and 25 female schools), were selected to be involved in this project in the first stage, from different educational regions in the Kingdom of Saudi Arabia [40]. The number of schools participated in *Tatweer* project are significantly increased around the country. For example, the number of *Tatweer* schools in the city of Jeddah, in Saudi Arabia, until 2014 was 30 schools (ten primary schools, ten intermediate schools, and ten secondary schools). Then, in 2015 this number has doubled to be 60 *Tatweer* schools (twenty primary schools, twenty middle schools, and twenty secondary schools) [41].

IV. Purpose of the Study

This study aims to investigate how Saudi teachers in primary schools were trained to use IWBs. It aims also to examine teachers' gender differences, according to the number of training courses, the types of training they need, and the training methods preferences.

V. Questions of the Study

1) How Saudi teachers in primary schools were trained to use IWBs?
2) Are there any statistically significant differences between male and female Saudi teachers in terms of the number of IWB training courses they had received?
3) Are there any statistically significant differences between male and female Saudi teachers in terms of the types of training they need?
4) Are there any statistically significant differences between male and female Saudi teachers in terms of their training methods preferences?

VI. Methodology

The sample

The sample of this study consisted of 587 teachers (286 males and 301 females) from primary schools participated in *Tatweer* project in the city of Jeddah, in Saudi Arabia. This work conducted during the academic year 2014/2015 (*more details about the participants indicated in Table 1*).

Table 1: Number/percentage of the participants

		N	Percent
Gender	Male	286	49
	Female	301	51
Fields of teaching	Mathematics	110	19
	Science	100	17
	Social Sciences	54	9
	Computer Sciences	16	3
	Foreign Language (English)	74	13
	Islamic Sciences	94	16
	Arabic Language and Literature	99	17
	Special needs	11	2
	other	29	5
Teachers' workload	Less than 10	103	18
	10-19	257	44
	20-24	223	38
	More than 24	4	1
Experience of using IWBs	Less than one year	250	43
	1-5 years	303	52
	More than five years	34	6

Data collection

The mixed methods approach employed in this study. Data were collected by using a questionnaire, classroom observations, and semi-structured interviews. However, the findings from the utilization of the questionnaire will be only presented in this paper. The questionnaire consisted of two sections. The first part involves general information about the participants such as availability of IWBs, gender, teachers' experience, fields of teaching, teachers' workload, and the location of IWBs in schools. The second section consisted of eight multiple-choices questions to address teachers training regarding IWBs. Some of these questions adapted from two studies [33;42].

Validity and Reliability of the Instrument

The questionnaire was piloted with 15 Ph.D. students, in the UK, in the field of educational technology for both *face-validity* and *content-validity*. Therefore, some changes were done to produce the final version of the questionnaire. Additionally, Cronbach's alpha (α= 0.876) was calculated to ensure the *internal reliability* of the questionnaire.

Data analysis

The quantitative data was analyzed by using the Statistical Package for Social Sciences (SPSS v 21). Descriptive statistics

were used in this study as well as Chi-Square test to identify any significant differences relating to gender.

VII. FINDINGS

1) How Saudi teachers in primary schools were trained to use IWBs?

a) Training Sources

Table 2 indicates the training sources of Saudi teachers in *Tatweer* primary schools in Jeddah. Self-trained teachers had the highest mean score (*M*=0.41, *SD*=0.49), followed by training by colleagues (*M*=0.32, *SD*=0.47). Whereas, training from the education department (*M*=0.26, *SD*=0.44) was in the third place. The option of "no training" (*M*=0.15, *SD*=0.36) was in the fourth place, and the lowest mean scores were in favor of training by private organizations (*M*=0.06, *SD*=0.23).

Table 2: Descriptive statistics

	Mean	Std. Deviation
Self-trained	0.41	0.49
By a colleague	0.32	0.47
By the education department	0.26	0.44
No training	0.15	0.36
By private organizations	0.06	0.23

b) The number of IWB training courses

Table 3: The number of IWB training courses

	N	Percent
None	349	60
1-3	230	39
More than 5	8	1
Total	587	100

Table 3 present the number of IWB training courses that obtained by Saudi teachers in primary schools participated in *Tatweer* project. Fascinatingly, the majority of these teachers (60 %) did not receive any training courses, neither by the education department nor by private organizations. While 39% of teachers had training courses between 1-3 courses. However, only eight teachers (1%) who received more than five training courses relating to the use of IWBs.

c) Reasons that prevent Saudi teachers from attending training courses

Table 4 clarifies the reasons that prevent Saudi teachers, in *Tatweer* schools in the city of Jeddah, from attending training courses regarding the use of IWBs in classrooms. Remarkably, unavailability of IWB training courses was chosen by most teachers (52%) while the rest of the reasons had a very low percentage. The lowest percentage (1%) was in favor of (*I dislike attending courses that relate to technology use*) which was only selected by eight teachers.

Table 4: Reasons that prevent teachers from attending training courses

	N	Percent
Unavailability of IWB training courses	304	52
Attending training courses are time-consuming	39	7
These courses held in other cities	36	6
IWB training courses are not necessary	23	4
I have appropriate skills in using IWBs	20	3
IWB training courses do not improve my teaching	16	3
I dislike attending courses that relate to technology use	8	1

d) Saudi teachers' satisfaction towards their level of training

Table 5: Teachers' satisfaction towards their level of training

	N	Percent
Very satisfied	58	10
Satisfied	130	22
Neutral	332	57
Dissatisfied	67	11
Total	587	100.0

Table 5 shows teachers' satisfaction towards the level of training they had received. Interestingly, a large portion of Saudi teachers (57%) in the sample were neutral about showing their satisfaction towards their level of training while 22% of them were satisfied. A further 10 % were very satisfied. However, 11% of the respondents were dissatisfied.

e) Saudi teachers' answers regarding receiving assistance when they encounter any difficulties relate to the use of IWBs?

Table 6 presents Saudi teachers' replies to the availability of assistance in the event of problems regarding the use of IWBs. The majority of respondents 49 % indicated that they sometimes were provided by assistance, while, 24% of teachers revealed that they rarely find support. Only 14% of teachers who always find help. In contrast, 13% of Saudi teachers had never provided with any assistance when problems occur.

Table 6: Teachers' answers regarding receiving assistance when using IWBs

	N	Percent
Always	82	14
Sometimes	288	49
Seldom	143	24
Never	74	13
Total	587	100.0

f) Saudi teachers' answers regarding the need for further training in using IWBs?

Table 7: Teachers' answers regarding the need for further training

	N	Percent
A lot of needs	323	55
little need	236	40
No need	28	5
Total	587	100.0

Table 7 shows the responses of teachers regarding their needs for further training. Most teachers in the sample (55%) responded that they comprehensively need further training relate to the use of IWBs followed by 40% of teachers with little need for training. Nevertheless, a few percentage (5%) of teachers revealed that they did not need any more training, indicated that those teachers were proficient teachers in using this technology.

g) Saudi teachers' answers relating to the types of training they thought they needed to be effective users of IWBs?

Table 8 clarifies the type of training that chosen by Saudi teachers in primary schools for best and more efficient use of IWBs in classrooms. The option of "*Technical skills in the use of IWB*" (*M*=0.66, *SD*=0.47) had the highest mean scores. Then "*Effective teaching techniques by using IWB*" (*M*=0.56, *SD*=0.50) option, and finally "*designing educational resources compatible with IWBs*" (*M*=0.47, *SD*=0.50) option.

Table 8: Descriptive statistics

	Mean	Std. Deviation
Technical Skills in the use of IWB	0.66	0.47
Effective Teaching Techniques by using IWB	0.56	0.50
Designing Educational Resources compatible with IWBs	0.47	0.50

h) Teachers' training methods preferences

Table 9: Descriptive statistics

	Mean	Std. Deviation
Attend training courses and workshops	0.71	0.45
Observe lessons of skilled educators	0.53	0.50
Collaboration with colleagues	0.36	0.48
More time for self-training	0.25	0.43

Table 9 presents the most training methods favored by Saudi teacher in *Tatweer* primary schools. Remarkably, "*attend training courses and workshops"* (*M*=0.71, *SD*=0.45) had the highest mean scores. Followed by "*observe lessons of skilled educators"* (*M*=0.53, *SD*=0.50), while "*collaboration with colleagues*" option (*M*=0.36, *SD*=0.48) was in a third place. Finally, "*self-training"* (*M*=0.25, *SD*=0.43) had the lowest mean scores.

2) Are there any statistically significant differences between male and female Saudi teachers in terms of the number of IWB training courses they had received?

Table 10 presents the results of a cross tabulation between teachers' gender and the number of the received IWB training courses. Chi-square [$\chi 2$ (2, N=587) =4.177 and p=0.124],

indicated that there was not a significant association at the 0.05 level in this case.

Table 10: Chi-Square test between teachers' gender and the number of IWB training courses

Gender	Number		Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	2	4.177	0.124
Female	301				

3) Are there any statistically significant differences between male and female Saudi teachers in terms of the types of training they need?

a) The technical skills in the use of IWBs

Table 11: Chi-Square test between teachers' gender and their choice of technical skills in the use of IWBs

Gender	Number		Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	2.219	0.136
Female	301				

Table 11 shows that a cross tabulation between teachers' gender and their choice of technical skills in the use of IWBs. Chi-square [$\chi 2$ (1, N=587) =2.219, and p= 0.136] indicating a no significant association at the 0.05 level for this type of training.

b) The effective teaching techniques by using IWBs

In Table 12, Chi-square was $\chi 2$ (1, N=587) =9.256, and $p<0.05$ indicating there was a significant association between teachers' gender and their reported need for effective teaching techniques using IWBs. As indicated in Table 13, 331 Saudi teachers from both gender selected training in effective teaching techniques by using IWBs. Thus, female teachers (57%) reported a greater need for improving their skills in this type of training courses than males (43%).

Table 12: Chi-Square test between teachers' gender and their choice of effective teaching techniques by using IWB

Gender	Number		Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	9.256	0.002
Female	301				

Table 13: Teachers' gender and their choice of effective teaching techniques by using IWBs

		Effective teaching techniques by using IWB		Total
		No	*Yes*	
Gender	male	143	143	286
	female	113	188	301
Total		256	331	587

c) The designing educational resources compatible with IWBs

Table 14: Chi-Square test between teachers' gender and their choice of designing educational resources

Gender	Number		Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	0.007	0.934
Female	301				

In Table 14, Chi-square was $\chi 2$ (1, N=587) =0.007, and p= 0.934. Therefore, this association was not significant at the 0.05 level in terms of male and female teachers relating to their needs for training courses focused on designing educational resources compatible with IWBs.

4) Are there any statistically significant differences between male and female Saudi teachers in terms of their training methods preferences?

a) Attend training courses and workshops

Table 15 indicates the results of Chi-square [$\chi 2$ (1, N=587) =3.201, and p= 0.074] through a cross tabulation between teachers' gender and their preference for attending training courses and workshops. Therefore, there was not a significant association in this case (at the 0.05 level).

Table 15: Chi-Square test between teachers' gender and their preference for attending training courses and workshops

Gender	Number		Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	3.201	0.074
Female	301				

b) Observe lessons of skilled educators

Table 16: Chi-Square test between teachers' gender and their preference for observing lessons of skilled educators

Gender	Number	Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	0.000	0.998
Female	301				

p= 0.998 indicating that there was not a significant association between these two elements at the 0.05 level.

c) Collaboration with colleagues

Table 17 indicates that Chi-square was $\chi 2$ (1, N=587) =0.436, and p= 0.509. Therefore, no significant difference was found between teachers' gender and their preference for collaboration with colleagues at the level of 0.05.

Table 17: Chi-Square test between teachers' gender and their preference for collaboration with colleagues

Gender	Number	Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	0.436	0.509
Female	301				

d) More time for self-training

Table 18: Chi-Square test between teachers' gender and their preference for self-training

Gender	Number	Degree Of Freedom	Value Of (Chi-Square)	Statistical Significance
Male	286	587	1	6.740	0.009
Female	301				

Table 19: Teachers' gender and their preference for self-training

		More time for self-training		Total
		No	*Yes*	
Gender	male	228	58	286
	female	212	89	301
Total		440	147	587

Chi-square between teachers' gender and their preference for self-training was indicated in table 18, [$\chi 2$ (1, N=587) =6.740, and p<0.05]. Therefore, a significant association was shown in this case at the level of 0.05. According to Table 19, 147 Saudi teachers from both genders revealed that they were in line with self-training for improving their competence when using IWBs. As a result, female teachers approximately (61%) were considerably more than males (39%) in preferring self-training to develop their abilities to use IWBs.

VIII. Conclusions and Discussion

This paper has described the quantitative findings of a study carried out in primary schools participated in *Tatweer* project in the city of Jeddah in Saudi Arabia. It aims to investigate how teachers were trained to use IWBs and identify their training needs. The findings of this study indicated that the majority of Saudi teachers had been trained through two kinds of training (self-training (*M*=0.41, *SD*=0.49) and via their colleagues (*M*=0.32, *SD*=0.47)).Teachers who had trained from the education department (*M*=0.26, *SD*=0.44) was in the third place. The lowest percentage of teachers had trained by private organizations (*M*=0.06, *SD*=0.23).

Surprisingly, the reason that prevented most Saudi teachers within the sample from attending IWB training courses was lack of availability of these courses, which was chosen by most teachers (52%). Whereas, the rest of the reasons had very small percentages. Although a large portion of Saudi teachers (57%) in the sample were neutral about showing their satisfaction towards their level of training, 22% of them were satisfied with their level of training. A further 10 % were very satisfied. However, 11% of the respondents were dissatisfied about the level of training they had received and that because of the lack of training courses provided for those frustrated teachers. There is no doubt about the usefulness of training courses in enhancing teachers' satisfaction and increasing their confidence, skills, and pleasure.

Most teachers in the sample (55%) reported that they need further training relate to the use of IWBs. Nevertheless, only a few percentage 5% of teachers did not need any more training, indicating that these teachers were probably proficient teachers in using this technology. In addition, most teachers in the sample (49 %) sometimes found assistance, only 14% of them always finds help when problems occurred, 13% never got any assistance, and 24% rarely found support. Indeed, teachers need adequate training and support to increase the efficiency of using these technologies in schools.

With regards to the types of training they need, technical skills in the use of IWBs (*M*=0.66, *SD*=0.47) was ranked with the highest mean scores. Followed by effective teaching techniques by using IWBs (*M*=0.56, *SD*=0.50), and finally designing educational resources compatible with IWBs (*M*=0.47, *SD*=0.50). Thus, Saudi teachers have a high training need in all these three types of training; thought there was a slight difference regarding their needs. When teachers can successfully gain IWB technical skills, they are stimulated to improve their teaching methods [43]. Therefore, Saudi teachers should be highly trained to use IWBs effectively in order to be dynamic users of these technologies.

The most favoured training method indicated by teachers was attending training courses and workshops (*M*=0.71, *SD*=0.45). Observing lessons of skilled educators (*M*=0.53, *SD*=0.50) ranked next highest. Then, followed by collaborating with colleagues (*M*=0.36, *SD*=0.48). Finally, more time for self-training (*M*=0.25, *SD*=0.43) has received a low ranking from teachers. In this study, there was no difference between female and male teachers in terms of the number of IWB training courses and the types of training (*IWB technical skills* and *designing educational resources compatible with IWBs)*. Nevertheless, female teachers' responses indicated that they saw themselves as more need of further training than males in the effective teaching techniques by using IWBs. Although female teachers more desired self-training method than men, other training methods (attending training courses, observing lessons of skilled educators, cooperating with colleagues) were equally favored by both genders.

The conclusions drawn from this study provide evidence about the lack training courses from the education department. As indicated by the majority of Saudi teachers within the sample (60 %) who reported that they did not receive any training courses, neither by the education department nor by private organizations. Consequently, this has had an important effect on Saudi teachers' IWB skills and their satisfaction about their level of training, leading them to depend on themselves or their colleagues to improve their abilities.

Therefore, training Saudi teachers in both technical and pedagogical skills as well as providing support from the school administration are essential for effective integrating of IWBs in classrooms. In this study, attending training courses and workshops was the most training method favored by teachers for training. However, the lack of availability of these courses was identified by most teachers as the most important reason that prevented them from attending IWB training courses.

No significant differences were found between male teachers and females relating to the following variables (*the number of IWB training courses*, *IWB technical skills*, *designing educational resources compatible with IWBs*, *attending training sessions*, *observing lessons of skilled educators*, *cooperating with colleagues*). However, significant differences were indicated relating to the two variables (*effective teaching techniques by using IWBs* and *self-training method*) which were more favored by female teachers.

To sum up, based on these findings the views of teachers in Saudi schools towards their current training and their real needs should be highly considered in designing successful training courses relating to the use of IWBs in the future.

IX. Suggestions for Future Research

In this study, the training needs of teachers in schools participated in *Tatweer* project were based on their perceptions. Therefore, it is suggested that conducting similar study targeting to explore teachers' training needs based on the views of school administrations and educational supervisors. Moreover, further research needs to be carried out to investigate the effect of school culture and technical support on teachers' use of IWBs in *Tatweer* schools and their professional development programs. Furthermore, the effectiveness of an IWB training course designed using the findings of this study could be used to explore effects on the teachers' use of IWBs in classrooms.

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