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## The Use of the Interactive White Boards in Tatweer Primary Schools in Saudi Arabia

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**ABSTRACT:** This paper is a part of a larger study aimed at investigating the use of the Interactive White Boards (IWBs) in primary schools that participated in the Tatweer project in the city of Jeddah in Saudi Arabia. 587 teachers (301 females and 286 males) completed a self-report questionnaire specially designed for this study, but also drawing on earlier research. Twenty teachers (10 female and ten male) were interviewed, of these seven female teachers were also observed teaching in their classrooms or the learning resources rooms. The majority of teachers in this study reported that they used IWBs infrequently and only with a few interactive features, indicating that their choices were limited by their current technical capability. Moreover, they presented only a basic repertoire of pedagogy with technology because they mainly used IWBs for whole class teaching. They occasionally varied this, such as when groups of students used the boards. Therefore, they showed a limited range of IWBs use in their classrooms. However, in this study, teachers' experience in using IWBs and the opportunity to receive training were the two important factors to determine teachers' capability in using IWBs.

**KEYWORDS:** Effective use of IWBs; Pedagogical change; Student engagement.

### I. INTRODUCTION

The effectiveness of using IWBs is limited by the ability of educators in choosing suitable pedagogical methods more than just technical interactivity[40, 20]. Effective pedagogical interactivity necessitates teachers being able to plan effective and organized lessons that are focused on cognitive development and pace of activity, and which aim to achieve the teaching and learning objectives[21]. Therefore, teachers should change their pedagogy and allow their students to participate more in classrooms[19]. Students are usually willing to use IWBs by themselves[33, 38]. Consequently, preventing students from using IWBs may lead to a decrease in their motivation and achieving a more student-centred approach. When students interact with IWBs, according to Beauchamp [8], this could create an environment where students are the centre of the learning process, whereas teachers, in this case, are classified in more progressive phases of using IWBs. However, IWBs generally stimulate a teacher-centred instructional style where students have a low-level of dynamic contribution[39]. Indeed, students' use of the board in classrooms is not enough for the effective use of this technology; what is more important is how teachers organize their use of the board and plan activities to enable a wider range of pedagogical uses for students. Thus, effective teaching basically relies on the teachers' skills and how they incorporate IWBs in their pedagogy[21]. The capability and experience of educators are the main factors that lead to pedagogical change[32] and better lesson quality[42].

Several studies have indicated that teacher-centred approaches are still highly supported in Saudi classrooms[1, 2, 3, 6], where a traditional teaching style is the standard method. Thus, the Ministry of Education in Saudi Arabia has launched several projects and programs to increase the quality of teaching methods to become more student-centred. The Tatweer project is one such project, which concentrates on training teachers and encouraging them to use various teaching methods. This large-scale project was launched in 2007 and aimed to improve the quality of education in public schools in Saudi Arabia, to meet the requirements of the 21st century[35]. Therefore, this paper aims to examine teachers' use of IWBs in Tatweer primary schools in Saudi Arabia, using a questionnaire, classroom observations, and

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semi-structured interviews. The questionnaire used in this study was completed by a large number of primary teachers (n=587). Accordingly, the importance of this study appears from its contribution to produce useful information and knowledge that could be used to support future improvement in the use of IWBs in Saudi Arabia by providing new information about the primary school teachers in how they use this technology. Moreover, twenty teachers (10 female and ten male) who taught a variety of subjects were interviewed as well as seven female teachers were observed teaching in their classrooms or the learning resources rooms. Thus, it is the first study in which female teachers were observed regarding their use of IWBs in Saudi primary schools participating in the Tatweer project.

## II. TEACHERS AND EFFECTIVE USE OF IWBs

IWBs should be used in different ways from any other kind of technology[27]. Consequently, for more effective use of IWBs, teachers should use them daily in the classroom[7] so that they become confident and fluent in their use and will lead to developing educators' skills[16]. Jwaifell and Gasaymeh[26] conducted a study to investigate English female teachers' use of IWBs in Jordan. The authors applied a qualitative case study approach with just four female English teachers. Data were gathered using semi-structured interviews, observations, and document analyses. Teachers' daily use of IWBs in this study shifted their teaching methods from traditional to more interactive methods, using conversations, group work, and open educational sources. Indeed, it seems likely that the daily use of IWBs could be guaranteed when IWBs are installed in classrooms[24]. However, daily interaction and consistent use of IWBs may not be reached when IWBs are not located in classrooms, for instance, in the learning resource rooms[4, 24]. A study conducted by Alghamdi[4], to investigate the use of Saudi primary teachers of IWBs in Yanbu city in Saudi Arabia using mixed methods (questionnaire and semi-structured interview) to gather data. The findings of this study showed that teachers acknowledged the influence of using IWBs on teaching and learning processes. However, they did not have regular use of IWBs in their lessons and that mostly due to the location of this technology in the learning resources rooms. Indeed, this is the case in most schools in Saudi Arabia where the majority of them have an IWB installed in resource rooms[4, 5]. Moreover, the lack of teacher training in using IWBs caused the limited use of IWB features.

To increase the teaching effectiveness when using IWBs, educators should consider two essential elements: the length and the frequency of using IWBs[23]. Therefore, time and practice should be offered to ensure the effective use of IWBs. Consequently, teachers need consistent training and more time for practice to become fluent and confident in using IWBs [34]. Beauchamp [8] examined teachers' use of IWBs in UK primary schools, and found both that there was an association between the attitudes of teachers towards IWBs and the regularity of using IWBs, and that the period of using these technologies was significant. Similarly, the same findings were confirmed in another study[37]. According to De Vita *et al.* [14] in their review of the literature, many teachers still use IWBs as traditional white/blackboards or just as presentational devices. Indeed, using IWBs as presentational tools, especially in a context in which educators control the learning environment, could lead to a reduction in student motivation and their ability to reflect [19]. Consequently, this could negatively affect the effectiveness of teaching (*ibid.*). Therefore, teachers should be aware of the interactive features of IWBs[18], which is a significant element that distinguishes this technology from other educational technologies. Educators should also contemplate improving their IWB technical and pedagogical skills for more effective use of these technologies and improvement in their teaching quality[9, 21, 30, 31, and 36]. Jang and Tsai[25] state that expert teacher should have better knowledge to demonstrate the subject content by using effective pedagogical teaching approaches more than novice teachers. Advanced teachers were more effective at using IWBs than novice teachers, possibly because progressive teachers usually use high-scale features of IWBs, in an interactive approach, to present their lessons when communicating with IWBs; in contrast, beginner teachers use IWBs as an ordinary whiteboard[8].

Several studies have proven that instructional technology does not always change teachers' traditional style, as they alternatively fit the technology into their current pedagogical methods[13, 29, 41, 42, and 43]. Indeed, this might be explained by the fact that educators could be inspired by the technical possibilities of IWBs more than their pedagogical affordances[22]. A study conducted by Manny-Ikan *et al.* [30] to evaluate a SMART project that was installed in six middle and secondary schools. Data were collected from 24 lessons observations, interviews, student focus groups, and questionnaires. The outcomes revealed that the motivation and engagement of students improved

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when using IWBs. The main uses for the IWBs as indicated by educators were using the Internet, giving presentations, and engaging students in lessons. It seems likely that these teachers used IWBs in a basic way, and they still needed to improve their technical skills with IWBs. They used IWBs to aid their existing teaching rather than transform it, and collaborative learning groups were ignored in their lessons.

Another study conducted by Kneen [28], which focused on examining how English skills and content can be supported using IWBs in secondary classrooms in the UK. A case study approach was applied where seven experienced teachers were observed during their lessons. The findings indicated that the participating teachers were active users of IWBs, and they delivered significantly organized resources. Teachers successfully integrated IWBs into their lessons because IWBs offer chances for educators to design the curriculum content. Nevertheless, IWBs were used in limited ways, and program selections limited the IWB affordances. Additionally, there was a lack of multimedia resources, training programs, and student interaction. In the majority of the observations (80%), teachers were the main users of IWBs, but students' use was approximately 19% of the total use of this technology. This was followed by the use of both the teacher and students (0.5%) and then the group of students (0.3%). Moreover, the whole class was the main audience for most of the observations (88%). Then, the teacher was the audience for 10% of the lessons, where students presented to their instructor alone and a smaller percentage, approximately 2%, was for using IWBs with a group of students. Thus, traditional approaches clearly appeared in this study and affected both content and pedagogy as indicated by teachers.

However, a study conducted by Blau [10] reported that the majority of the time in all the lessons for whole class teaching was only 50%. This was followed by individual learning (28%), and then small group activities (22%). This study investigated to what extent teachers in primary schools employed an IWB professional development program in their instructional practices. 43 primary teachers, who were inexperienced in using IWBs, attended this training course and they frequently applied the fundamentals learned and experienced during the training course into their lessons. Their role in most of the lesson time supported student-centred learning (57.3%), where the teachers are not the main sources of knowledge. In contrast, teacher-centred education accounted for 42.7% of the lesson time, and was thus reduced in this study. Indeed, this study proved that the adequate training of teachers during the IWB training program led to the successful employment of IWB technology in the lessons prepared by the teachers. Therefore, progressive change can be achieved using technology in classrooms and providing teachers with effective professional development programs [17].

## III. RESEARCH METHODOLOGY

### A. Research Design

The current study is a quantitative-dominant mixed methods research study that mainly used a sequential explanatory strategy, in which quantitative data were collected and analysed, followed by the collection and analysis of qualitative data. This approach was chosen to gain a broad understanding of teachers' use of IWBs by collecting the quantitative data and then using qualitative methods to improve and explain the numerical results by discovering the views of participants, as recommended by Creswell *et al.* [12]. Data were collected in this study using questionnaires, classroom observations, and semi-structured interviews. The SPSS software program was used to analyze the quantitative data while thematic analysis was used with the qualitative data.

### B. Sample

Twenty primary schools participating in the *Tatweer* project, distributed equally between boys and girls in the city of Jeddah. Some of these schools were equipped with IWBs in all classrooms. Whereas, others had IWBs in few classrooms and for some schools in the learning resource rooms only. However, some of these schools had three learning resource rooms supported with IWBs. 587 teachers (301 females and 286 males) completed a self-report questionnaire. Twenty teachers (10 female and ten male) who taught a variety of subjects were interviewed, of these seven female teachers were also observed teaching in their classrooms or the learning resources rooms. Classroom observations were conducted only with females because of the Saudi culture where the educational system is based on single-sex schools. Regarding the interviewees, fifteen had more than one year of experience using IWBs, while only

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five were novice female teachers. 15 teachers had IWBs in their classrooms, and five teachers had IWBs only in learning resource rooms. Moreover, three male teachers reported that they had IWBs in both laboratories and classrooms.

### C. Reliability and Validity

The questionnaire's reliability was first tested when piloting the questionnaire with fifteen Ph.D. students for both face-validity and content-validity. Then, the internal consistency was tested for the entire sample using Cronbach's Alpha coefficients [11, 15]. Thus, an acceptable level of reliability ( $\alpha = 0.876$ ) was indicated.

## IV. RESULTS

### A. The Quantitative Results

According to Table 1, the majority of teachers within the sample (52%) had employed IWBs in their lessons for a period of 1-5 years, 31% of teachers sometimes used IWBs in their lessons, 43% of them used IWBs with a few interactive features, 43% of these teachers revealed that students occasionally use the IWB in their lessons, and 90% of them used IWBs for whole class teaching.

**Table 1: The quantitative results regarding the use of IWBs**

The Use of IWBs	N	The Majority of Teachers		The Rest of Teachers	
<i>The experience of using IWBs</i>	587	51.6%	1-5 years	42.6 %	Less than one year
				5.8%	More than five years
<i>The frequency of using IWBs</i>	587	31%	Sometimes	23%	Seldom
				29%	Often
				18%	Always
<i>Using IWB features</i>	587	43%	A few interactive features	18%	Use the IWB as an ordinary white/ blackboard
				39%	Use the IWB with most of the interactive features
<i>The users of IWBs</i>	587	43%	Students occasionally use the IWB	18%	Teachers only use IWBs
				39%	Students frequently use the IWB
<i>Audiences</i>	587	90%	Whole class teaching	20%	Small groups
				8%	With individuals

Moreover, Chi-square test was applied to clarify the significant differences between some selected variables: the location of IWBs, the frequency of use of IWBs, the experience in using IWBs, and using IWB features (see Table 2).

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Table 2: The associations indicated between some selected variables

First variable	Second variable	Type of Association	Level of Significance
<i>The frequent use of IWBs in lessons</i>	Location in classrooms	$[\chi^2 (3, N=587) = 52.39; p < 0.001]$	0.001
	Location in resource rooms	$[\chi^2 (3, N=587) = 56.05; p < 0.001]$	0.001
<i>Teachers' experience in using IWBs</i>	The frequency of use	$[\chi^2 (6, N=587) = 211.23; p < 0.001]$	0.001
	Using IWB features	$[\chi^2 (4, N=587) = 150.96; p < 0.001]$	0.001

## B. Summary of the use of IWBs by the seven female teachers

All seven observed female teachers used IWBs to present and review the content of their lessons, but they varied in applying IWBs during activities and at the start of their lessons. Additionally, the use of IWB features and allowing students to use the board were considered differently by the teachers observed, depending on their experience in using IWBs. The teachers who had more than one-year experience in using IWBs used several interactive features and allowed their students to use the board more than the novice teachers allow. Moreover, the majority of the time in the seven observed lessons approximately (63.57%) was spent on whole class teaching, followed by 28.86% of the lesson time for individuals. A smaller proportion of the lesson time, about 7.57%, was for small groups. Thus, the teachers observed in this study generally preferred whole class teaching more than teaching to individuals or small groups when using IWBs. Furthermore, 80% of the lesson time in all seven observed lessons in this study was for teachers' use, compared with students' use, which was only 20%. Consequently, teachers were also the main users of IWBs in this study.

## V. DISCUSSION

### A. The Frequency of Using IWBs in Lessons

The majority of respondents (31%) indicated that they sometimes used IWBs in their lessons. Only 18% of teachers reported that they had daily use of IWBs in their lessons (see Table 1). This is inconsistent with the findings of a study conducted by Jwaifell and Gasaymeh (2013), where all the teachers in this study used IWBs daily and this helped them to shift their teaching methods from traditional to more interactive methods. However, the participants were only four teachers compared to the large sample (n=587) in the current study. For more effective use of IWBs, teachers should have daily use of these technologies in classrooms [7] to become confident and fluent in their use [16].

However, teachers' frequent use of IWBs in the current study differed based on the location of IWBs and teachers' experience in using IWBs. Regarding the location of IWBs, it appears that for those teachers who had regular and daily use of IWBs in their lessons, these technologies were placed in their classrooms or learning resources rooms in schools that have more than one learning resources room. This suggestion was statistically confirmed by a highly significant association between the frequent use of IWBs and their location in classrooms and learning resources rooms  $[\chi^2 (3, N=587) = 52.39; p < 0.001]$  and  $[\chi^2 (3, N=587) = 56.05; p < 0.001]$ , respectively (see Table 2). When IWBs are placed in each classroom, teachers seem to be encouraged to use them daily. Similarly, when they are also placed in the learning resources rooms, teachers (who are working there) or teachers (in schools that had more than one resources room) tend to employ them in their lessons constantly.

In the current study, teachers who had IWBs in their classrooms indicated that they used these technologies daily in each lesson. For instance, one observed teacher said, "I am lucky because I have the IWB in my classroom, so I use it every day in all my lessons." Similarly, another observed teacher, who was from a school that had three learning resources rooms, indicated that she used IWB daily, "Although the IWB is located in the resources room, I like to use it in all my lessons because my students like to use it." However, some teachers indicated that they sometimes used the IWB in their lessons because of the location of this technology in the learning resources room. They had only one

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learning resources room in their school with one IWB. For example, one teacher said, “*I did not use the IWB in all my lessons because it is in the resources room which was far away from my classroom.*”

Similarly, teachers’ frequent use of IWBs and the location of these technologies were also closely associated in an earlier study[4]. Therefore, IWBs should not be fitted in a computer room but inside classrooms to be used as a tool for simplifying curriculum learning and to encourage teachers to use them fully[24]. The second explanation for the frequent use of IWBs could be related to educators’ experiences. Those teachers who indicated that they often and always use IWBs in their lessons could be expert teachers, whereas those teachers who reported that they sometimes and rarely used IWBs were likely to be beginner teachers. This explanation is confirmed statistically in Table 2, which shows a highly significant association between the experience of teachers in using IWBs and their frequency of use [ $\chi^2(6, N=587) = 211.23; p < 0.001$ ].

## B. The Use of Interactive Features

A high number of respondents (43%) in this study used IWBs with a few interactive features (see Table 1). Similarly, the findings of a study conducted by Manny-Ikan *et al.*[30] indicated that the majority of teachers used a few features. Thus, it likely seems that those teachers in the current study used IWBs in a basic way, and they still need to improve their technical skills of using IWBs. Indeed, two potential connections are associated with more efficient use of IWB features in classrooms. These two possibilities could relate to teacher training and their experience of using this technology.

The first possibility seems to be confirmed by the interviewees’ reports. For instance, one teacher reported that she used few interactive features because she had not had any training courses. She said, “*I use some of the IWB features in my lessons because I have limited knowledge in using IWBs because of a lack of training.*” In contrast, another teacher reported, “*I always use most of the features of the digital board based on my lessons*” because “*I participated in three training courses relating to the use of IWBs.*”

Moreover, the suggestion regarding the second possibility (teachers’ experience), is also statistically supported by Table 2. There was a highly significant association [ $\chi^2(4, N=587) = 150.96; p < 0.001$ ] between the experience in using IWBs and the use of IWB features, confirming that teachers with more experience in using IWBs tend to be more active users of the interactive IWB features in their lessons. This result is consistent with Beauchamp [8], who found that advanced teachers were more effective in using IWBs than novice teachers. Similarly, the interviewees in this study with more than one year’s experience in using IWBs (15 teachers) reported more use of the interactive features than the five novice female teachers did.

## C. The Audience

In this study, the majority of teachers (90%) indicated that they use IWBs for whole class teaching followed by 20% of teachers who employed these technologies in small groups. In contrast, 8% of respondents revealed that they use IWBs with individuals (see Table 1). This result is in line with other research studies indicating that the IWB lessons are more regularly controlled by whole-class instruction[22, 28, and 43]. Moreover, through classroom observations in the current study, the majority of the time in the seven observed lessons approximately (63.57%) was spent on whole class teaching, followed by 28.86% of the lesson time for individuals. A smaller proportion of the lesson time, about 7.57%, was for small groups. Similarly, this outcome is consistent with the results of a study conducted by Kneen [28], which indicated that the whole class was the main audience for most of the observations. However, a study conducted by Blau[10] reported that whole class teaching only took half of all lesson time. Thus, most of the observed teachers in the current study preferred whole class teaching to teaching either individuals or small groups when using IWBs.

However, the capability and experience of educators are the main factors that lead to pedagogical change[32] and increased lesson quality[42]. Indeed, this seems to be confirmed in the current study, where the observed female teachers used the IWB for whole class teaching more often than for both small groups and individuals. Interestingly, only one teacher used the IWB to present activities for both individuals and small groups. Thus, it seems that this teacher successfully changed her pedagogy to involve more students in her lesson. Indeed, this teacher was an expert in using IWBs (seven years’ experience in using IWBs) and used this technology daily. She had also had three training courses in her school, as she indicated in her interview, “*I had three training courses in my school when this technology*

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was installed in the school.” Therefore, she combined two important factors that helped her to transform her pedagogy; sufficient experience and training.

## D. The Users of IWBs

82% of teachers in this study reported that they allowed students to use IWBs in their lessons compared to only 18% of teachers who did not (see Table 1). Moreover, 80% of the lesson time in all seven observed lessons in this study was for teachers’ use, compared with students’ use, which was only 20%. As a result, teachers were the main users of IWBs in this study and this finding, interestingly, is also found in a study conducted by Kneen [28]. Indeed, IWBs generally stimulate a teacher-centred instructional style where students have a low-level of dynamic contribution[39]. However, this finding is inconsistent with a study conducted by Blau[10], in which the role of the teachers in most of the lesson time supports student-centred learning (57.3%) where teachers guide their students and scaffold their learning. In contrast, teacher-centred education (42.7%) of lesson time was reduced in this study. In other words, although the teachers employed pedagogical approaches, they widely used constructivist activities in their lessons. However, students did not have a chance to use IWBs by themselves in other studies[22, 43]. Allowing students to use IWBs could be connected to two important factors, teachers’ experience in using IWBs and the availability of training.

The first factor could be confirmed through the seven observed teachers in this study, who had more than one-year’ experience in using IWBs and who allowed their students to use the board. Conversely, the novice teachers were the only users of this technology in their lessons. For example, one novice teacher stated,

*I never permit my students to use the board because I am not an expert in using this technology, and I am still learning. Therefore, I did not train my students to use it; alternatively, they use the ordinary whiteboard to solve exercises.*

In contrast, the expert teachers tended to allow their students to use IWBs. For example, an expert teacher said,

*I frequently allow my students to use the IWB in my lessons because I noticed that how they are excited to touch the board and motivated to participate in activities presented via this technology.*

This finding agrees with Jang and Tsai[25] who stated that expert teachers should have better knowledge to demonstrate the subject content by using effective pedagogical teaching approaches more than novice teachers.

Moreover, those teachers who were the only users of IWBs, or their students had infrequent use of the IWB in classrooms, seem to be more likely to have had a lack of training. This explanation was supported through classroom observations. The observed teachers, who had not had any training courses related to the use of IWBs, did not allow their students to use the board. This association was also confirmed during the interviews, for instance, one novice teacher said,

*Actually, I never allow my students to use the IWB because I am suspicious that students might disrupt the board, and then the school administration will blame me.*

Then, she explained this during the interview when she stated, “I am a beginner teacher in using this technology, and I have not received any formal training courses.” Thus, the lack of training perhaps led to a lack of confidence in using IWBs, and consequently limited students’ experience of these technologies in classrooms.

## VI. CONCLUSION

The conclusions drawn from this study provide evidence about the range of teachers’ technical and pedagogical skills of using IWBs in Saudi Arabia. Most teachers within the sample reported that they used IWBs infrequently and only employed a few interactive features, indicating that their choices were limited by their current technical capability. However, teachers’ frequent use of IWBs in the current study differed based on the location and teachers’ experience in using IWBs. Moreover, the majority of teachers presented only a basic knowledge of pedagogy because they used IWBs for whole class teaching and only occasionally varied this, such as when their students used the board. Similarly, most teachers in the classroom observations were the main users of IWBs in their lessons, and they preferred whole class teaching over teaching either individuals or small groups. However, in this study, teachers’ experience in using IWBs and the opportunity to receive training were the two important factors determining teachers’ effectiveness in using IWBs. Hence, pedagogical change seems to be crucial for the efficient use of IWBs. Consequently, teachers in

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Tatweer schools should develop their pedagogy to support more student-based learning, and this can be only achieved by providing them with appropriate training.

## REFERENCES

- [1] Al-Aklobi, M., The effectiveness of using the cooperative learning strategy in teaching the prophet's hadith and Islamic culture on the educational achievement and critical thinking of first-year secondary students. Doctoral thesis. Umm Al-Qura University, Makkah, Saudi Arabia, 2008
- [2] Al-Nefaie, N., To what extent science teachers have practiced some critical thinking skills in teaching middle school students in Riyadh. Master thesis. Imam Muhammad bin Saud Islamic University, Saudi Arabia, 2010
- [3] Al-Saadi, M., The effectiveness of teaching a unit on environmental pollution using the problem-centered learning strategy for developing the critical thinking of first secondary school students in Bisha. Master thesis. King Khaled University, Abha, Saudi Arabia, 2007
- [4] Alghamdi, A., An Investigation of Saudi Teachers' Attitudes towards IWBs and their Use for Teaching and Learning in Yanbu Primary Schools in Saudi Arabia. Master thesis. Newcastle University, UK, 2013
- [5] Alghamdi, A., "An Investigation of Saudi Teachers' Attitudes towards IWBs and their Use for Teaching and Learning in Yanbu Primary Schools in Saudi Arabia", International Journal of Arts & Sciences, vol. 8, no. 6, pp. 539-554, 2015
- [6] Alzaidi, A.M., 'Secondary School Head Teachers' Job Satisfaction in Saudi Arabia :The Results of A mixed Methods Approach ', ARECLS, vol. 5, pp. 161-185, 2008
- [7] Armstrong, V., Barnes, S., Sutherland, R., Curran, S., Mills, S. andThompson, I., "Collaborative research methodology for investigating teaching and learning: the use of interactive whiteboard technology", Educational Review, vol. 57, no. 4, pp. 457-469, 2005
- [8] Beauchamp, G., "Teacher use of the interactive whiteboard in primary schools: Towards an effective transition framework", Technology, Pedagogy and Education, 13(3), pp. 327-348, 2004
- [9] Beauchamp, G. andParkinson, J., "Beyond the 'wow' factor: developing interactivity with the interactive whiteboard", School Science Review, vol. 86, p. 316, 2005
- [10] Blau, I., "Teachers for "Smart Classrooms": The Extent of Implementation of an Interactive Whiteboard-based Professional Development Program on Elementary Teachers' Instructional Practices", Interdisciplinary Journal of E-Learning and Learning Objects, vol. 7, pp. 275-289, 2011
- [11] Cohen, L., Manion, L. andMorison, K., "Research Methods in Education". 6th edn. London: Routledge, 2007
- [12] Creswell, J.W., Plano Clark, V.L., Gutmann, M. andHanson, W., "Advanced mixed methods research designs", in Tashakkori, A. and Teddlie, C. (eds.) Handbook of mixed methods in social & behavioral research. Thousand Oaks, CA: Sage, pp. 209-240, 2003
- [13] Cuban, L., Kirkpatrick, H. andPeck, C., "High access and low use of technologies in high school classrooms: Explaining an apparent paradox", American Educational Research Journal, vol. 38, no. 4, pp. 813-834, 2001
- [14] De Vita, M., Verschaffel, L. andElen, J., "Interactive whiteboards in mathematics teaching: A literature review", Education Research International, vol. 2014, pp. 1-16, 2014
- [15] Gay, L.R. andAirasian, P.W., "Educational research, competencies for analysis and applications". New Jersey: Merrill/Prentice Hall, 2003
- [16] Glover, D. andMiller, D., "Running with technology: the pedagogic impact of the large-scale introduction of interactive whiteboards in one secondary school", Journal of Information Technology for Teacher Education, vol. 10, no. 3, pp. 257-278, 2001
- [17] Glover, D. andMiller, D., "Optimising the use of interactive whiteboards: an application of developmental work research (DWR) in the United Kingdom", Professional Development in Education, vol. 35, no. 3, pp. 469-483, 2009
- [18] Glover, D., Miller, D., Averis, D. andDoor, V., "The evolution of an effective pedagogy for teachers using the interactive whiteboard in mathematics and modern languages: an empirical analysis from the secondary sector", Learning, Media and Technology, vol. 32, no.1, pp. 5-20, 2007
- [19] Hall, I. andHiggins, S., "Primary school students' perceptions of interactive whiteboards", *Journal of Computer Assisted Learning*, vol. 21, no. 2, pp. 102-117, 2005
- [20] Hennessy, S., Deaney, R., Ruthven, K. andWinterbottom, M., "Pedagogical strategies for using the interactive whiteboard to foster learner participation in school science", Learning, Media and Technology, vol. 32, no. 3, pp. 283-301, 2007
- [21] Higgins, S., Beauchamp, G. andMiller, D., "Reviewing the literature on interactive whiteboards", Learning, Media and technology, vol. 32, no. 3, pp. 213-225, 2007
- [22] Higgins, S., Falzon, C., Hall, I., Moseley, D., Smith, F., Smith, H. andWall, K., "Embedding ICT in the literacy and numeracy strategies: final report". Newcastle: DU. [Online]. Available at: <http://dro.dur.ac.uk/1899/>, 2005
- [23] Hodge, S. andAnderson, B., "Teaching and learning with an interactive whiteboard: a teacher's journey", Learning, Media and Technology, vol. 32, no. 3, pp. 271-282, 2007
- [24] Hunt, M., Davies, S. andPittard, V., "The Becta Review 2006: Evidence on the progress of ICT in education". Coventry, England: British Educational Communications and Technology Agency (BECTA), 2006
- [25] Jang, S.-J. andTsai, M.-F., "Exploring the TPACK of Taiwanese elementary mathematics and science teachers with respect to use of interactive whiteboards", Computers & Education, vol. 59, no. 2, pp. 327-338, 2012
- [26] Jwaifell, M. andGasaymeh, A.-M., "Using the diffusion of innovation theory to explain the degree of English teachers' adoption of interactive whiteboards in the modern systems school in Jordan: A case study", Contemporary Educational Technology, vol. 4, no. 2, pp. 138-149, 2013
- [27] Kennewell, S. andHiggins, S., "Introduction to IWBs", Learning, Media and Technology, vol. 32, no. 3, pp. 207-212, 2007
- [28] Kneen, J., An exploration of how interactive whiteboard technology is being utilised in secondary English classrooms. Doctoral thesis. the University of Leicester, UK, 2014



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- [29] Knight, P., Pennant, J. and Piggott, J., "What does it mean to 'use the interactive whiteboard' in the daily mathematics lesson?", *Micromaths*, vol. 20, no. 2, pp. 14–16, 2004
- [30] Manny-Ikan, E., Dagan, O., Tikochinski, T.B. and Zorman, R., "Using the Interactive White Board in Teaching and Learning – An Evaluation of the SMART CLASSROOM Pilot Project", *Interdisciplinary Journal of E-Learning and Learning Objects*, vol. 7, no. 1, pp. 249-273, 2011
- [31] Moss, G., Jewitt, C., Levačić, R., Armstrong, V., Cardini, A. and Castle, F., "Interactive Whiteboards, Pedagogy, and Pupil Performance: An Evaluation of the Schools Whiteboard Expansion Project (London Challenge)". Department for Education and Skills/Institute of Education, University of London, 2007
- [32] Rogers, L. and Finlayson, H., "Developing successful pedagogy with ICT – How are science teachers meeting the challenge?", *Technology, Pedagogy and Education*, vol. 13, no. 3, pp. 287-305, 2004
- [33] Schmid, E.C., "Investigating the use of interactive whiteboard technology in the English language classroom through the lens of a critical theory of technology", *Computer Assisted Language Learning*, vol. 19, no. 1, pp. 47-62, 2006
- [34] Shenton, A. and Pagett, L., "From 'bored' to screen: the use of the interactive whiteboard for literacy in six primary classrooms in England", *Literacy*, vol. 41, no. 3, pp. 129-136, 2007
- [35] Tatweer, King Abdullah Project for General Education Development. Available at: <http://www.tatweer.edu.sa/Pages/home.aspx>, 2014
- [36] Turel, Y.K. and Demirli, C., "Instructional interactive whiteboard materials: Designers' perspectives", *Procedia-Social and Behavioral Sciences*, vol. 9, pp. 1437-1442, 2010
- [37] Turel, Y.K. and Johnson, T.E., "Teachers' Belief and Use of Interactive Whiteboards for Teaching and Learning", *Educational Technology & Society*, vol. 15, no. 1, pp. 381–394, 2012
- [38] Wall, K., Higgins, S. and Smith, H., "The visual helps me understand the complicated things': pupil views of teaching and learning with interactive whiteboards", *British Journal of Educational Technology*, vol. 36, no. 5, pp. 851-867, 2005
- [39] Way, J., Lilley, E., Ruster, C., Johnco, S., Mauric, L. and Ochs, L., "Symposium: Interactive white-boards and pedagogy in primary classrooms", Annual Conference of Australian Association for Research in Education. Canberra, Australia. pp. 1-18, 2009
- [40] Webb, M.E., "Affordances of ICT in science learning; implications for an integrated pedagogy", *International Journal of Science Education*, vol. 27, no. 6, pp. 705–735, 2005
- [41] Windschitl, M. and Sahl, K., "Tracing teachers' use of technology in a laptop computer school: The interplay of teacher beliefs, social dynamics, and institutional culture", *American Educational Research Journal*, vol. 39, pp. 165-205, 2002
- [42] Wood, R. and Ashfield, J., "The use of the interactive whiteboard for creative teaching and learning in literacy and mathematics: A case study", *British Journal of Educational Technology*, vol. 39, no. 1, pp. 84-96, 2008
- [43] Zevenbergen, R. and Lerman, S., "Pedagogy and interactive whiteboards: Using an activity theory approach to understand tensions in practice", *Mathematics: Essential research, essential practice*, vol. 2, pp. 853-862, 2007