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The Impact of Using the Interactive Whiteboard on Phonemic Awareness Instruction among EFL First Graders

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The aim of this paper is to investigate the influence of using the Interactive Whiteboard on phonemic awareness instruction among EFL first graders. For this study, a word recognition test was used as the research instrument. Pre-test, post-test, and delayed-word recognition were administered to 48 first graders, aged 7 on average, to both the experimental and control groups. The experimental group received the treatment for four weeks using IWB, whereas the control group was taught using the chalkboard. Paired sample t-test, independent sample t-test and one-way ANOVA were employed to analyse the data. The findings showed a significant difference in word recognition test scores in favor of the experimental group test ($t = 2.50$, $p < .05$). The mean score of the experimental group was better than that of the control group. The current study proposes some pedagogical implications for curriculum designers and concludes with recommendations and further studies on intervention programs.

Keywords: phonemic awareness, interactive whiteboard, EFL first graders, word recognition test

Introduction

The use of technology plays a critical role in teaching and learning several educational materials, including languages (Ishtaiwa & Shana, 2011). It is interesting to indicate that scholars in the second language learning asserted the importance of the use of innovative technology in different several primary classrooms in order to enhance reading skills and achievement (Barone & Wright, 2008; Chambers et al., 2011; Cheung & Slavin, 2011; Englert et al., 2005). The use of digital technology has been also proposed as a tool to facilitate learning and teaching of EFL reading (Choi & Lee, 2020). Moreover, research confirmed that literacy skills (Kennedy & Deshler, 2010), phonics, and decoding skills (Lenhard et al., 2011) are improved by instructional technology that measures student performance. Parr and Ward (2011) pointed out that one type of instructional technologies entering the education forum is the interactive whiteboard (IWB, hereafter). In the process of learning to read, young learners are required to acquire phonemic awareness skill with the contribution of IWB technology (Alhumsi, 2017).

It should be noted that the phonemic awareness skill and the integration of the IWB as an educational tool of technology will be addressed in this paper within the process of learning to read in order to reach an appropriate level of better readers. According to Yopp (1992), the skill of phonemic awareness represents the ability to hear and manipulate sounds in words; young learners need to fully comprehend those oral words and their syllables are composed of a series of sounds. As for the IWB instrument, Smith et al. (2005) stated that IWB can be described as a pedagogical instrument in a form of a large touch-

sensitive board which is connected to a computer and a digital projector. Images from the computer screen can be displayed on the large board.

Furthermore, other researchers consider IWBs as being interactive tools offered to both teachers and learners who are able to manipulate and control educational programs engaged by a touch sensitive screen (Beauchamp & Kennewell, 2008; Digregorio & Sobel- Lojeski, 2010; Hall & Higgins, 2005). For example, Wall et al. (2005) confirmed that "IWBs can be effective tools for initiating and facilitating the learning process, especially where pupil participation and use of the board is utilized" (p. 866). They concluded that a relationship exists between students' perception of learning and the interactive whiteboards, especially visual and verbal-social learning; the students were motivated by the colour and movement in a manner that reflected their concentration and interest. Interestingly, to make the activities of phonemic awareness instructions more interactive, such instructions in phonemic awareness should be provided via the integration of IWB. Yopp and Yopp (2000) claimed that "phonemic awareness activities should be playful and engaging, interactive and social, and should stimulate curiosity and experimentation with language" (p. 132). This indicates that the IWB can be integrated inside classrooms for the sake of interactive instructions of phonemic awareness skills.

It is noteworthy that phonemic awareness has been consistently characterized as one of the important skills in learning to read and write (Walsh, 2009) as well as an essential predictor of later reading achievement (Kaminski & Powell-Smith, 2017). However, research stressed that a broad gap between research knowledge state concerning learning to read and public understanding condition still exists (Castles et al., 2018). Besides, studies have revealed weak performance in reading and word-reading abilities among Jordanian primary school students (Al-Tamimi & Rabab'ah, 2007). This means that EFL first graders will find difficulty in understanding English skills, particularly reading through every school day. This may force them to be poor readers and drop out and lose potential education opportunities, creating poverty among generation (Gove & Cvelich, 2010).

On the other hand, a number of studies have shown the importance of using the IWB as an instructional tool which is basically a form of interactive technology (Digregorio & Sobel- Lojeski, 2010; Marzano, 2009; Smith et al., 2005). Johnson (2012) contended that there has been a positive relationship between reading achievement and instructional technology since the last two decades. Nonetheless, less is known about incorporating the IWB as an instructional tool into the EFL classrooms to help young learners improve their phonemic awareness skill (Johnson, 2012).

The importance of this study stems from the great public interest regarding the way how young learners learn to read as well as the best strategies that are presented to them (Castles et al., 2018). In addition, this study is crucial due to the fact that there is a remarkable need in Jordanian educational system to shed more light on young learners who are at-risk in reading skill. Therefore, early intervention programs are of paramount importance for all of them, especially those who struggle with reading. For example, Torgesen et al. (2001) confirmed that young learners who struggle with reading skills often experience hardships in the level of phonemic analysis skills. The researchers added that young learners need to have an intensive and systematic program that can terminate the hardships in reading skill. Moreover, it should be noted that curriculum designers, principals, and English teachers should depend on the findings of the research to guide instructional and firm decisions to accelerate the development of reading skill process.

In short, this study will help provide a better understanding of the impact of the use of IWB on phonemic awareness instructions among EFL first graders. Hence, it aims at investigating the impact of using the IWB on phonemic awareness instruction among EFL first graders in relation to the Jordanian educational context. For this study, the research question is as follows: Are there significant differences in the word recognition test scores between EFL first graders taught with phonemic awareness instructions using the IWB and those who are taught with a chalkboard?

Literature Review

Phonemic Awareness and Learning to Read

Phonemic awareness has been identified as pivotal skill in the learning to read process (Hoover, 2002). It is also regarded as single area of literacy that lies under the phonological umbrella, referring to the smaller chunks of speech sounds (Walsh, 2009). Yopp (1992) defined phonemic awareness as the understanding that sequences of speech sounds coins spoken words and syllables. For example, phonemic awareness is to understand that the sounds /r/ /a/ /t/ form the word 'rat' and the word 'car' consists of the sounds /k/ /a/ /r/ (Choe et al., 2020). Once children acquire phonemic awareness skill, they can address the phonemes and manipulate them in spoken words (Adams, 1994; Griffith & Olson, 1992; Liberman et al., 1974).

To recognize and pronounce a word, Morris (1993) noted that that a young learner is probably able to divide words into its smaller chunks to clarify the phonemes (sounds) included in words and eventually link them to graphemes (letters). In a study conducted by Linan-Thompson and Vaughn (2007), the researchers demonstrated that two graphemes may describe one phoneme, some graphemes have more than one phoneme, and letter names do not necessarily represent that letter's main sound. The same researchers concluded that there is an association between phonemic awareness and beginning reading. In another study, Cunningham (1990) examined whether implicit verses explicit phonemic awareness instructions had an impact on young learners' reading achievement. In her study, explicit instruction linking phonemic awareness to the reading skill was more efficient. Young learners also demonstrated further motivation to use phonemic awareness as well as decoding strategies.

Additionally, phonemic awareness skill plays a noticeable role in young learners' reading acquisition. It is critical that there is "compelling evidence" (p. 779) in which phonemic awareness is required to enhance grapheme-phoneme relationships during the learning phases of reading acquisition (Juel, 1991). However, a young learner who experiences difficulties in reading often needs further instructions in literacy skills. Wang (2008) argued that the absence of such literacy instructions can cause a gap that probably deters children from learning to read in their later grades. Besides, inadequate level of phonemic awareness instructions can create hardships in language learning for a large number of young learners, especially in spelling and reading (Berg & Stegelman, 2003).

In order to build a solid literacy education pertaining to learning to read, it is advised that phonemic awareness development in emerging readers is essentially required. Griffith and Olson (1992) posited that once young learners are able to gain a paramount understanding of phonemic awareness, they can fully understand the foundation of speech sounds. Moreover, Edelen-Smith (1997) accentuated the effectiveness of early training in phonemic awareness skill; a skill that is required to help in improving early reading instruction as well as reducing reading failures inside classrooms. All in all, the above-mentioned studies did not address the impact of using the IWB on phonemic awareness instruction among EFL first graders.

Interactive Whiteboard and Learning to Read

The academic literature showed that there are a few studies available on IWB (Smith et al., 2005). In most countries such as USA, Australia and Canada and some developing countries, the growing development of IWB has been slow despite of various project reports conducted in those countries. Such reports have been conducted by faculties in higher education institutions and instructors at schools (Smith et al., 2005). Interestingly, most studies involving surveys and interviews tackled users' views of IWB instructional use. In addition, IWB has been used as an instructional tool in classrooms. For instance, to find out the relationship between learning to read and IWB, Shenton and Pagett (2007) pointed out that in the field of literacy teaching including spelling and phonics in primary schools the IWB has been positively utilized as an instructional tool. In a study conducted by Amiri and Sharifi (2014), the researchers' aim is to determine the effect of the use of the interactive whiteboards in teaching writing.

The researchers compared the traditional methods on teaching adverbs and the use of CALL devices in teaching adverbs as well as their usage in writing. In their study, 80 Iranian EFL male students studying in secondary schools divided into two groups. The results revealed that the adverbs are more accurately used by students in their writing when teachers and students adopted the interactive whiteboard.

In terms of the use of technology in a context where students learn a foreign language, a study conducted by Gray et al. (2005) revealed the effects of IWB on foreign language classrooms. At the end of their studies, the scholars found that using the visual factors involving animation, highlighting and color is the reason leading to have students focus on forms involving negative expressions and reflexive pronouns in addition to various components of sentences, namely nouns, adjectives and question words. This indicates that the IWB can be used inside EFL classrooms.

In Jordanian context, in Jordanian Modern Systems School, Jwaifell and Gasaymeh (2013) conducted a qualitative study to investigate teachers' perceptions toward the IWB use. The researchers adopted the theory of Rogers' (2003) diffusion of innovations in their study. Furthermore, they discussed the features of IWB that leads to a considerable influence on the decisions of the teachers pertaining to adopting and using the IWB. They concluded that training workshops should be given more interests concerning the integration of the IWB inside classrooms. Thus, their research did not address the effect of IWB usage on phonemic awareness instruction.

In a word, a few studies have investigated the impact of the use of the IWB on learners' engagement as well as teaching literacy in general (Smith et al., 2005). However, these studies did not investigate the influence of the use of IWB on phonemic awareness instructions among EFL first graders. Therefore, any activity given in a classroom to boost phonemic awareness skill can be implemented on the IWB. This results in having an interactive and engaging class as well.

Theoretical Framework

Various theories of reading development confirmed that the process of word reading grows in the form of stages or phases (Ehri, 2005; Frith, 1985; Stuart & Coltheart, 1988). For example, Ehri (2005) offered four phases of word recognition. The same researcher affirmed that specific requirements of literacy knowledge is significant for children to completely build grapheme-phoneme associations. These phases can be used in decoding, or in the process of blending and segmenting graphemes in words into its constituent phonemes (Ehri, 2005). Figure 1 demonstrates Ehri's (2005) phases of word recognition development.

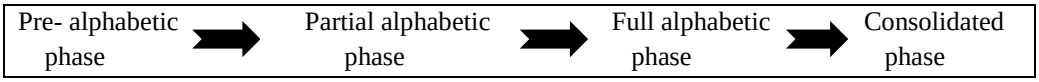

Figure 1. An illustration of Ehri's (2005) phases of word recognition development.

This theoretical framework proposed by Ehri (2005) offers four phases. These phases include pre-alphabetic, partial alphabetic, full alphabetic, and consolidated alphabetic phase. In the process of the pre-alphabetic phase, young learners rely primarily on environmental cue to read words due to their little understanding that the letters in printed words systematically map onto the sounds they hear in spoken language. Once this phase is acquired, they can then move to the next phase. In the second phase, i.e., the partial alphabetic phase, they lack the full knowledge of the alphabetic system, causing hardships in some letter-sound relations. When they are able to construct complete letter-sound relations in pronouncing definite words, they move to the full alphabetic phase. Within this phase, letter-sound relations in words are preserved as larger components in memory. As for the last phase, i.e., consolidated alphabetic phase, Ehri (2005) presented the features of this process in order that memory load can be reduced. For example, the word 'chest' might be processed only as two units 'ch' '-est' compared with four units represented by

the following phonemes (/ch/, /e/, /s/, /t/). In this phase, young learners acquire the full awareness of letter-sound relations.

The current study selected Ehri's (2005) phases of word recognition development since it tackled emerging readers' acquisition of word recognition. This model only refers to emerging readers who are at the word level of text (Beecher, 2011; Ebert, 2009), featuring as a deep detailed model of early word recognition as well (Ebert, 2009).

Methods

A quantitative method design was used since it dealt with numerical data that can be statistically collected and analyzed (Creswell, 2012). The data were obtained from the quasi-experimental design to investigate the impact of using IWB on phonemic awareness instructions among EFL first graders. Two classes chosen randomly represented the two intact groups. The experimental group, known as Group A, received instructions in phonemic awareness through using IWB, whereas the control group represented by group B received instructions in phonemic awareness without the use of IWB.

Sampling

48 male first graders studying at Basic State School for Boys in Jerash represented the target population and their age was 7 on average. They were all Arabic native speakers registered in the first grade. In their EFL first grade classrooms, the participants were regarded as emerging readers who were officially exposed to learning English as a foreign language at their primary schools. It is interesting to consider that the researcher used the convenience sampling in this study. Table 1 demonstrates participants' information.

TABLE 1
Participants' Information

	Group A	**Group B**
Age	7 on average	7 on average
Gender	Male	Male
Language Experience	Beginning readers of English language	Beginning readers of English language
Students No.	24 students	24 students

Research Instrument

The research instrument for this study represented by pre-tests and post-tests was administered to first graders at the first semester of the school year 2015. It should be noted that the word recognition test was adopted from Clay's (1979) Ready-to-Read Word Test (List C). The Clay's (1979) Ready-to-Read Word List C has a noticeable reliability. The cronbach alpha for the word recognition test, list C, was estimated to be .92 (Kim, 2009). Since word recognition test, list C, enjoys a reliability of .92, this qualifies it to be an appropriate instrument concerning any further decisions to be made in relation to the achievement of first graders' test scores. The research instrument was checked for validity through referring to university professors specializing in the field of linguistics.

Research Procedure

The word recognition test was introduced to two groups of 48 EFL first graders as a pretest and posttest instrument. It should be noted that training session was created for the participating teacher. Training included a remarkable discussion of the concept of phonemic awareness instructions. Phonemic

awareness instructions were demonstrated through using IWB as well as the traditional chalkboard. The participant teacher practiced lesson materials for the intervention in the experimental group through the integration of the IWB and presented the lesson materials to the control group through using a traditional chalkboard. Thus, both groups were taught by the same teacher.

Pre-test session

After the end of the participant teacher's training session, the pre-test session started immediately. In the pre-test session, the pre-test was individually given to the participants of the two groups by the researcher who tested them using the word recognition test (List C) (Alhumsi, 2017; Durgunoglu et al., 1993). It is important to note that the word recognition test aimed at identifying young learners' needs of learning and teaching, especially those who have difficulties with reading. Nutbrown (1997) pointed out that this test has been used to gauge emerging literacy development. In addition, this assessment tool (list C) consists of 15 common English words in order to assess how many words the children could already read in English (Durgunoglu et al., 1993). During the first testing session, the researcher gave an explicit instruction in order to tell the first graders that they were going to read English words. He asked each individual to read the fifteen words in list C. The participant student credited one point for each word he correctly read. The instructions were given in English and were translated into Arabic (the first language of the participants). By doing so, any misunderstanding can be avoided in the pre-test sessions.

The intervention session

After the pre-test session, the intervention session was introduced to group A, the experimental group, and group B, the control group. A well-trained teacher presented all tasks concerning the intervention in groups A and B. Group A received instructions in phonemic awareness through using IWB. On the other hand, Group B was taught without the use of IWB. The researcher did the video recordings. It is important to consider that the single intervention session took about 10 minutes in length over four weeks. There were three sessions of treatment in a week for each group. Concerning the intervention, there were two sessions held with respect to the experimental and control groups. The first intervention session involved the experimental group followed directly by the second session that involved the control group.

Phonemic awareness instructions of the experimental group. EFL first graders in the intervention classroom received phonemic awareness instructions with the use of the IWB three days per week. During the intervention, the participant teacher focused on the sound of the language rather than their corresponding letters. For example, he divided the English word "car" into its individual sounds /k/, /a/, and /r/. The students were required to identify the initial, middle and final sounds of the given words. Young learners should understand that words are formed by blending phonemes together. Thus, 'cat' is constructed by blending /k/, /æ/ and /t/. children should also be able to recognize that there is a difference in meaning occurring when the /k/ in 'cat' is replaced with /s/ and a new word, 'sat' is formed.
The participant teacher used Elkonin boxes (or sound boxes) to start breaking words into its individual sounds via using the IWB during the whole intervention lessons. All activities were done through the IWB. Activities included counting the number of different phoneme sounds, manipulating the sounds in a word, recognizing the specific phonemes within a provided word (represented by a picture clue displayed on IWB), matching picture clues with the correct phoneme from a given list, and filling in blanks with missing sounds.

Phonemic awareness instructions of the control group. In the second session, EFL first graders in the control group received phonemic awareness instructions through a traditional teaching method. The same duration applied to group B. The same teacher provided follow-up worksheets and other activities to practice the skill of phonemic awareness during the whole lessons. During this session, the teacher started saying the target word in a normal way (car) and then stretching it in a manner that each sound was made explicit (kkk – aaa – rrr). The students' job was to say the word slowly by stretching it and then saying it in a normal speed. Also, demonstrating the skill of phonemic awareness was through using Elkonin boxes drawn on the traditional chalkboard. After the end of the intervention of the two groups, the post-test session was initiated in the following day by the researcher.

Post-test session

After the completion of the intervention, the post-test instrument was given by the researcher to the EFL first graders in the experimental and control group under the same conditions as the pre-test session in order to evaluate the EFL first graders' progress of the phonemic awareness instruction. Providing the explicit instructions given in the first testing session, the researcher in the second testing session gave the same instructions in which young learners were going to read English words. Each individual was asked to read the fifteen words in list C. The participant first graders gained one point for each word he correctly read.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 22 was used for data analysis in this study. An independent sample t-test is used in the quasi-experimental study. Independent sample t-test is a statistical method used to show the variations among the means of two groups of a variable. It is crucial to note that this statistical method was used in this study to identify the significant differences between the first graders who received phonemic awareness skills via the incorporation of the IWB and those who received the same skills through using the traditional chalkboard. In other words, the reason behind conducting this experimental study was to investigate the impact of the IWB on word recognition test scores when teaching the instructions in phonemic awareness among EFL first graders.

The scores inserted in the SPSS program Version 22 by giving one mark (1) for each correct answer and zero (0) for incorrect answer. An independent samples *t*-test was actually used to check the homogeneity between experimental group and control group in word recognition test before starting the intervention. After the completion of the intervention, the results of post-test have been compared to the results of pre-test by implementing independent samples *t*-test statistical procedure.

In this way, the researcher could investigate the impact of the independent variable (using the IWB in teaching phonemic awareness skill) on the dependent variable (the change or growth of the scores in the word recognition test) by using an independent sample *t*-test. This technique was used in testing the null hypothesis pertaining to the research question.

Findings

The numerical data were analysed using the SPSS programme. The raw scores were analysed to determine if a significant increase was gained in the post-test scores compared to the pre-test scores by using *t*-test. It should be noted that Independent *t*-test results of the pre-tests of the experimental and control groups were examined to determine the initial abilities of the experiment and control groups. Thus, the group statistics and the results gained from both experimental and control groups were demonstrated in the forms of tables.

Pre–word Recognition Tests of the Experiment and Control Groups

Data for a total of 48 first graders were available for this study, consisting of 24 young students in the experimental group and the other 24 young students in the control group. Table 2 demonstrated the group statistics of the word recognition pre-test for the experimental and control groups presented for the EFL first graders. It also showed the number of participants, mean and standard deviation on the word recognition pre-test for each of these two groups.

TABLE 2
Group Statistics of Pre- Word Recognition Tests of the Two Groups

Group	N	*Mean*	*SD*	Std. Error Mean
Experimental	24	2.50	2.22	.454
Control	24	2.17	2.33	.477

The Comparison between the Two Groups in the Word Recognition Pre-tests

Table 3 showed the results of the Pre- Word Recognition Tests presented to the first graders in both groups. The results clearly demonstrated that there was no significant difference between the two groups in the word recognition tests (t = .506, p > .05). This indicates that the abilities of the word recognition tests were assumed to be identical at the beginning of this study in relation to the experimental group and the control group. Hence, any significant differences to be identified after the intervention will be attributed to the impact of the IWB.

TABLE 3
Independent sample T-test Results of Pre-Word Recognition Tests of the Two Groups

Group	N	*Mean*	*SD*	*t*	*p*
Experimental	24	2.50	2.22	.506	.61
Control	24	2.17	2.33		

The Comparison between the Two Groups in the Word Recognition Posttests

According to Table 4, the results indicated that there was a significant difference between the experimental and the control groups in the post word recognition test (t = 2.50, p < .05). The mean score of the experimental group was better than that of the control group. What does that indicate? It indicates that the use of IWB that caused the improvements of the first graders' level in the experimental group was positively confirmed.

TABLE 4
Independent sample T-test Results of Post Word Recognition Tests of the Two Groups

Group	N	*Mean*	*SD*	*t*	*p*
Experimental	24	6.17	4.488	2.50	.016
Control	24	3.46	2.797		

The Results of the Experimental Group in Both Post- and Delayed- Word Recognition Tests

It is interesting to consider that the paired sample *t*-test was run on each group's post and delayed test results to detect whether the same results found in the earlier test maintained the same. The table below demonstrated the paired sample *t*-test results. This test was therefore used to compare the averages of students in the post-test and delayed test of the experimental group. From table 5, the results indicated that there were no statistically significant differences in the average of posttest and the average of delayed

test (t = 1.873, p > .05). This means that the same results found in the earlier test maintained the same; the students have maintained most of the words they have learned (Ramirez & Jones, 2013).

TABLE 5
Paired sample T-test Results of Post- and Delayed-Word Recognition Tests of the Experimental Group

Experimental	N	*Mean*	*SD*	*t*	*p*
Posttest	24	6.17	4.488	1.873	.074
Delayed test	24	6.30	1.70		

The Results of the Control group in Both Post- and Delayed- Word Recognition Tests

Table 6 showed the paired *t*-test results. The test was used to compare the averages of students in the post- and delayed- word recognition tests of the control group. These results revealed that there were no statistically significant differences in the average of posttest and the average of delayed test.

TABLE 6
Paired sample T-test Results of Post- and Delayed-Word Recognition Tests of the Control Group

Control	N	*Mean*	*SD*	*t*	*p*
Posttest	24	3.46	2.797	-.071	.94
Delayed test	24	3.50	2.992		

The Results of Both Groups in the Post- and Delayed- Word Recognition Tests

As for Table 7, it illustrated the paired sample *t*-test results. The paired sample *t*-test was used to compare the averages of students in the post- and delayed-word recognition tests of both groups. These results showed that there were no statistically significant differences in the average of posttest and the average of delayed test. This indicates the effectiveness of the intervention.

TABLE 7
Paired sample T-test Results of Post- and Delayed-Word Recognition Tests of Both Groups

Both Groups	N	*Mean*	*SD*	*t*	*p*
Posttest	48	4.81	3.944	.955	.34
Delayed test	48	4.47	4.242		

It is important to indicate that the results of the quasi-experimental study revealed that using the IWB in learning phonemic awareness instructions has a remarkable impact on word recognition test scores among EFL first graders. The experimental group has achieved a significant progress after receiving the instructions in phonemic awareness via the incorporation of the IWB compared to their control group counterparts (Alhumsi. 2017). In addition, it has been found that both experimental and control group results showed that the participants have maintained most of the words they have learned.

The Results of Experimental, Control, and Delayed Word Recognition Posttest

To determine whether there were any statistically significant differences among experimental, control, and delayed Word Recognition Posttest, a one-way ANOVA was used. Table 8 showed the results of the One-Way ANOVA test analysis regarding experimental and control word recognition posttests as well as the delayed posttest of the experimental group.

TABLE 8
One-way ANOVA test of Experimental, Control, and Delayed Word Recognition Posttest

Groups	N	*Mean*	*SD*	Std. Error	*F*	*p*
Experimental	24	6.17	4.488	.916	2.640	.079
Control	24	3.46	2.797	.571		
Delayed	24	5.46	5.082	1.037		
Total	72	5.03	4.331	.510		

These results showed that there were no statistically significant differences in the average of experimental, control, and delayed word recognition posttest. In a nutshell, the One-Way ANOVA test analysis and independent sample *t*-tests illustrated no significant differences in word recognition posttest. This assuredly accentuates the effectiveness of the intervention (Ramirez & Jones, 2013).

Discussion

At the beginning of this study, EFL first graders of the control and the experimental groups were identical in their word recognition test results ($t = .506$, $p = .61$) based on the independent sample *t*-test. It is critical that the findings obtained from the pre-test session showed an obvious weakness in EFL first graders' word recognition (mean score 2.50/15 for experimental group and 2.17/15 for the control group). This result goes in line with the findings of Brown and Haynes (1985) and Ryan and Meara (1991) regarding noticeable reading problems and difficulties experienced by Arab learners of English. This also gives support to Fender's (2003) conclusion that Arab EFL young learners face difficulties in relation to word recognition acquisition process. Such weakness in word recognition acquisition is not surprising due to the fact that the word recognition pre-test was presented only after four months of the first-hand experience of EFL first graders with English writings. However, these results are still far below the expectations of the Ministry of Education in Jordan because young learners are expected by the end of first grade to read English and show understanding of learned simple words. In addition, EFL learners studying English language in an EFL environment do not usually get an explicit aim of learning that language. They do not dramatically grasp its significance as well (Kobayashi, 2018). Thus, effective and strict procedure should be made in order not to widen the gap between research knowledge state regarding learning to read and public understanding condition (Castles et al., 2018)

Moreover, the comparison between scores in both pre-tests and post-tests showed that experimental group has made a significant advancement after the explicit instructions in phonemic awareness through the integration of the IWB technology. In other words, the IWB significantly helped EFL first graders of the experimental group. This indicates that they did better in the word recognition test than those of the control group who received phonemic awareness instructions through a traditional chalkboard. However, the mean score of the experimental group was still relatively low (6.17/15). This actually offers further support to studies conducted by Fender (2003), Brown and Haynes (1985) and Ryan and Meara (1991). Nonetheless, this result indicates a noticeable development in the word recognition ability of the experiment group.

It is interesting to note that the control group demonstrated significant improvements after the four-week instruction in phonemic awareness. This progression has been in favor of phonemic awareness instruction. The mean score of the control group was (3.46/15) increased though it was very low. Consequently, training in phonemic awareness instruction through integrating the IWB in class explicitly helped the experimental group progress significantly in their word recognition posttest. In a nutshell, the experimental group's word recognition posttest scores were significantly better than those of the control group as illustrated in Table 4 due to the impact of integration of the IWB. Based on these findings, the IWB has tremendously advanced the word recognition test scores of EFL first graders. Thus, one cannot deny that the phonemic awareness instruction was regarded efficacious in facilitating EFL word

recognition of first graders. This result is confirmed by a number of research studies (e.g., Alhumsi, 2017; Al-Tamimi & Rabab'ah, 2007; Ball & Blachman 1991; Ehri et al. 2001).

It is extremely crucial to indicate that the integration of the IWB resulted in better improvements of the experimental group compared to the control group in the word recognition test. This result is not surprising in reference to previous research findings. For instance, it has been found that learners like IWBs since learning will be more fun as a result of the various types of resources and activities offered by such educational technology (Hall & Higgins, 2005). Another study conducted by Gray et al. (2005) confirmed the effects that IWBs have on foreign language classrooms. In sum, literature demonstrated empirical support for the use of IWB in improving reading achievement.

With respect to the delayed post-test, the aim of conducting delayed post-tests was to find out whether the use of the IWB enhanced students with acquisition and maintenance of learning. The results showed that there was an increase of the students' level. This finding could be related to the feature of this tool which enabled students to have more meaningful interactive experiences in the classroom, namely the IWB. When utilized in an enhanced and appropriate interactive way involving students in their learning, the IWB leads to the occurrence of meaningful learning (Wood & Ashfield, 2008). Moreover, the differences between the delayed post-tests and post-tests, although not statistically significant, indicate that both groups maintained their performance over that time period (Ramirez & Jones, 2013). This is a noticeable indication for the development of the acquiring the skills that allow for lifelong learning.

Conclusion

The purpose of this paper is to investigate the influence of using the IWB on phonemic awareness instruction among EFL first graders. It has been found that the experimental group has made a significant development after the explicit instructions in phonemic awareness skill through the incorporation of the IWB technology. By integrating the IWB, young students can eminently benefit from such skill in order to eliminate their chances to struggle with reading. Thus, this study proves the effectiveness of use of IWB. This study provides a remarkable contribution to the growing body of knowledge regarding the field of phonology and technology represented by phonemic awareness skill and the IWB respectively in the world and particularly in the Arab region.

In this paper, two potential implications can be provided. The first implication concerns with theoretical aspect, suggesting that the instruction in phonological awareness can be learnt and taught. This gives support to the view offered by some researchers (e.g., Ball & Blachman 1991; Ehri, 2005; Snow et al., 1998). As for the other implication, it is considered as pedagogical, proposing that explicit phonemic awareness instruction, accompanied by the use of the IWB, can be integrated in Jordanian curricula with respect to Jordanian EFL young learners from the first grade since the experimental group has achieved a remarkable progress in English word recognition test. This probably convinces curriculum designers, English learners, teacher trainers, and textbooks authors to pay more attention to the advantages and benefits of the use of the IWB and the significant role the phonemic awareness skill play in improving EFL first graders' reading achievement. In achieving this purpose, teachers are also required to modify their teaching strategies by doing on-going training on using the IWB that serve their students in acquiring the required skills, particularly the phonemic awareness skill.

Based on the results of the current paper, a variety of suggestions and recommendations can be coined concerning integrating the instructions of phonemic awareness skill through the integration of the IWB into the English curriculum and classrooms respectively in order to attain the required development of young learners in reading skill. A number of propositions can also be made regarding how to help the interested people representing the Ministry of Education in attending the scientific conferences as well as organizing workshops to raise the professional level of the first graders' teachers. It is also recommended that teachers of first graders should support the application of the IWB within their school lessons activities and participate in educational training courses pertaining the phonemic awareness skill. Given

that this research concerns quantitative approach, it would be useful to consider qualitative methodology to gain more potential fruitful results. Finally, this current study was limited to the population from which the sample was drawn. It tackled EFL male first graders studying in the basic primary state school in Jerash, Jordan. Hence, the results of this study cannot be generalized to secondary students. In addition, adopting qualitative or mixed research method could offer more accurate data as quantitative method was only used for this this research.

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