Obstacles to Using Interactive Whiteboards for Teachers of Students with Learning Disabilities

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Summary
This study aims to identify the obstacles to using interactive whiteboards for teachers of students with learning disabilities (LDs) in the Makkah region and to delineate any differences in the levels of these obstacles that can be attributed to the study variables: teachers' gender, academic qualifications, age, and years of experience. The researchers applied the descriptive survey approach to a sample of 123 teachers of LD students. To analyze the results, frequencies, averages, standard deviations, and relative weights were calculated. The results of the study indicated that the levels of the obstacles to using interactive whiteboards for teachers of LD students were moderate. No statistically significant differences in the levels of these obstacles were related to the variables of gender or age, whereas significant differences were found based on academic qualifications and years of experience.

Keywords:
Obstacles, Learning Disabilities, Interactive Whiteboard, Teachers

1. Introduction

Through the Vision 2030, the Ministry of Education has paid special attention to persons with disabilities and the development of their curricula, teaching methods, and modern technologies. Students with learning disabilities (LDs) represent one category of persons with disabilities and have been shown to have a remarkable deficit in academic level compared to their neurotypical peers While they may have an average or above average IQ, their disabilities considerably hinder their learning due to problems with basic processes, such as attention, memorization, thinking, and perception, as well as academic disabilities, such as dyslexia, dysgraphia, dyscalculia, spelling problems, and issues with written expression. However, the disabilities faced by LD persons are not caused by hearing, visual, or intellectual impairments; developmental disorders; or environmental or cultural deprivation (Al-Samadi and Al-Shamali, 2017). This category of people requires exciting motivation to learn, a suitable environment that supports them, and high self-confidence to make education effective (Al-Fiqi and Hijazi, 2016). Therefore, it is necessary to adapt the appropriate teaching strategies to suit them and introduce new forms of technology that meet their needs (Pozzi, 2011; Riqa et al., 2017).

Interactive whiteboards are a recent development in the world of educational technology that have had an effective impact on improving educational processes. The results of previous studies confirmed their effectiveness with LD students by altering the roles of teachers and students (Dahlan, 2014) and altering the learning environment to effectively meets the needs of LD students through different audio, visual, and kinesthetic patterns.

Interactive whiteboards are large white touchscreens that users can write on directly using a dedicated stylus. They display animations, graphics, audio, video clips, and other types of educational activities. They are connected to a computer, tablet device, or projector and controlled using the touch feature or with a dedicated stylus (Lai, 2019). Al-Anzi and Al-Omari (2019) highlighted the effectiveness of interactive whiteboards and their impact on learning process and writing skills for LD students with low motivation to learn. Using this exciting technology can enhance this group's motivation through continuous interaction with the ideas presented and the integration of multiple elements, such as images and videos, to teach a topic. This serves the principle of educational integration and enables students to keep pace with educational developments that enrich their knowledge (Al-Qarawi and Ghannam, 2019).

The current study aims to identify the obstacles that teachers face in using interactive whiteboards to teach LD students. This paper delineates any differences in these obstacles that may be attributable to teachers' gender, academic qualifications, age, or years of experience.

2. Literature Review

Khalifa (2020) investigated the most common obstacles facing teachers in using modern technologies for persons with special needs. The researcher used the descriptive approach in the governorate of Abu Arish, Jazan region. The study population consisted of 60 male

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and female teachers. The study results identified several obstacles related to i) special education teachers (teachers' insufficient knowledge of how to use these devices), ii) persons with special needs (problems that may prevent them from using such devices), and iii) school administration (long distances between classrooms and the resource room and the lack of appropriate educational aids). The researchers recommended conducting continuous courses for special education teachers, providing appropriate technologies for persons with special needs, and establishing learning centers.

In the same year, Hakami (2020) conducted a study in the city of Riyadh to identify the obstacles that limit the use of interactive whiteboards among teachers of LD students using the descriptive approach. A questionnaire was administered to 140 male and 175 female teachers. The results revealed that there were no skilled technicians in the field or courses to show teachers how to use interactive whiteboards. Further, teachers were not kept abreast of new developments in the world of modern technologies. The researcher recommended removing the obstacles that limited the use of interactive whiteboards, producing educational materials by securing all necessary material capabilities, and providing a permanent internet connection. The study also suggested publishing a brochure in Arabic on how to use interactive whiteboards, keeping teachers informed of changes, reducing the administrative burden on teachers, and conducting research studies on the effectiveness of interactive whiteboards and their impact on achievement.

Abu Nawwas (2020) investigated the obstacles that hinder teachers of LD students from using interactive whiteboards in Jordan. A questionnaire was administered to a sample of 53 randomly selected teachers of LD students. The results identified several obstacles, including teachers' ignorance of how to use interactive whiteboards, inability to buy the devices for financial reasons, and lack of specialists in this field. The study recommended encouraging all principals, teachers, and supervisors to employ interactive whiteboards in all courses; providing teachers with the necessary knowledge about modern technologies; developing interactive lessons for all educational levels; making the technology available in all schools in the Kingdom of Jordan; and conducting courses for teachers on media and design work.

Al-Sharida (2017) reported on the obstacles facing faculty members in their use of educational technologies. The descriptive approach was used, and a questionnaire was administered to 400 members of Wadi Al-Dawasir colleges. The results indicated that there were statistically significant differences in the obstacles faced by faculty members in terms of training, technical support, and equipment needed based on gender, with females reporting more difficulties than males. There were also statistically significant differences between the obstacles faced based on years of experience, with the more experienced educators having more difficulties.

Al-Qasabi (2017) found that teachers of LD students are aware of the effectiveness of interactive whiteboards and the obstacles to their use. The study sample consisted of 498 male and female teachers of LD students in the Sultanate of Oman According to the questionnaire analysis, the results indicated that teachers' perceptions were high regarding the effectiveness and importance of interactive whiteboards and the obstacles to their use, with no statistically significant differences attributable to the variables of specialization or experience.

3. Methods and Procedures

This study used the descriptive survey method. The study population included 123 male and female teachers of LD students in the Makkah Al Mukarramah region.

3.1 Study Sample

The pilot sample consisted of 34 teachers of LD students. A questionnaire on the obstacles to using interactive whiteboards for teachers of LD students was applied. The final sample included 123 teachers of LD students. Table 1 shows the statistical description of the participants in the study according to the variables studied.

Table 1: The statistical description of the participants in the study according to the variables

Variable	Category	n	%
Gender	Male	70	56.9
	Female	53	43.1
Academic qualification	Bachelor's degree	89	72.4
	Post-graduate diploma	6	4.9
	Master's degree	28	22.8
Age	25–30 years	29	23.6
	31–40 years	68	55.3
	> 40 years	26	21.1
Years of experience	< 5 years	19	15.4
	5–10 years	48	39.0
	> 10 years	56	45.5

3.2 Study Tool

A questionnaire was developed to identify the obstacles that teachers face in using interactive whiteboards to teach LD students in the Makkah region. The final version of the tool consisted of 25 items under two dimensions: obstacles facing teachers of LD students in using interactive whiteboards (11 items) and obstacles to using interactive whiteboards in the resource room (14

items). The independent variables included gender, academic qualification, age, and years of experience. The validity of the study tool was established by calculating the face validity and the internal consistency of the tool using Pearson correlation coefficients. The reliability was calculated using Cronbach's alpha coefficient (0.858) and the half-split method (0.862).

4. Results

To answer the main study question (*What levels of obstacles do teachers face when using interactive whiteboards to teach LD students in the Makkah region?*), the researchers calculated the frequencies, percentages, arithmetic averages, standard deviations, and ranks of teachers' responses to the study tool. Table 2 highlights the results for the first question.

Table 2: Arithmetic means and standard deviations of the dimensions of the study tool on the levels of obstacles teachers face when using interactive whiteboards

Dimension	M	SD	RW	Rank	Level
Obstacles related to the teachers	2.02	0.37	67.31	1	Moderate
Obstacles related to the resource room	1.98	0.22	66.05	2	Moderate
Total	2.00	0.26	66.68	3	Moderate

According to Table 2, the overall mean of the study tool was 2.00, which indicates that the level of obstacles that teachers face when using interactive whiteboards to teach LD students was moderate.

4.1 Study Sub-Questions

To answer the first sub-question (*Do the levels of obstacles that teachers face when using interactive whiteboards to teach LD students differ based on gender?*), the t-test was used to examine the two independent groups (Table 3).

Table 3: T-test results for the differences between males and females regarding the levels of obstacles teachers face when using interactive whiteboards to teach LD students attributable to gender

Dimension	Male (n = 70)		Female (n = 53)		t value	p value
	M	SD	M	SD		
Total	2.00	0.25	2.00	0.28	0.06	0.95

According to Table 3, there were no statistically significant differences at the level of $p < 0.05$ that can be attributed to the gender variable (male vs. female), which indicates that gender does not affect the level of obstacles facing teachers of LD students when using interactive whiteboards.

To answer the second sub-question (*Do the levels of obstacles that teachers face when using interactive whiteboards to teach LD students differ according to academic qualification?*), the Kruskal–Wallis test was used (Table 4).

Table 4: Results of the Kruskal–Wallis test to identify the differences in the levels of obstacles faced by teachers when using interactive whiteboards to teach LD students attributable to academic qualification

Dimension	Academic qualification	n	Rank average	χ^2	p value
Total	Bachelor's degree	89	65.74	6.227	0.044*
	Postgraduate diploma	6	73.58		
	Master's degree	28	47.64		

*$p < 0.05$.

Table 4 shows statistically significant differences at $p < 0.05$ regarding the levels of obstacles facing teachers in using interactive whiteboards, which means that the academic qualification variable affects the levels of these obstacles.

To answer the third sub-question (*Do the levels of obstacles facing teachers when using interactive whiteboards to teach LD students differ according to the age variable?*), non-laboratory tests were needed due to the large discrepancy in the age categories. Therefore, the Kruskal–Wallis test was applied. Table 5 shows the results.

Table 5: Results of the Kruskal–Wallis test to identify the differences in the levels of obstacles facing teachers when using interactive whiteboards to teach LD students based on age

Dimension	Age	n	Rank average	χ^2	p value
Total	25–30 years	29	55.34	1.341	0.512
	31–40 years	68	63.75		
	> 40 years	26	64.85		

Note: χ^2 degrees of freedom = 2.

Table 5 indicates no statistically significant differences at the level of $p < 0.05$, which means that age does not affect the levels of obstacles teachers face when using interactive whiteboards to teach LD students.

To answer the fourth sub-question (*Do the levels of obstacles teachers face when using interactive whiteboards to teach LD students differ according to the years of experience?*), non-laboratory tests were used because of the large discrepancy in the number of individuals in the teaching experience categories. Table 6 shows the results of the Kruskal–Wallis test.

Table 6: Results of the Kruskal–Wallis test to identify the differences in the levels of obstacles teachers face when using interactive whiteboards to teach LD students based on years of experience

Dimension	Years of experience	n	Rank average	χ^2	p value
Total	< 5 years	19	44.34	6.170	0.046*
	5–10 years	48	62.34		
	> 10 years	56	67.70		

*p < 0.05.

Table 6 shows statistically significant differences at p < 0.05 for the levels of obstacles teachers face when using interactive whiteboards, which means that years of experience affects the levels of these obstacles.

5. Discussion

Employing interactive whiteboards requires that teachers acquire the necessary skills to use the technology in addition to effective preparation and qualifications for working with LD persons. This finding is consistent with the results of Al-Muqbel (2019), Hakami (2020), and Khalifa (2020), who concluded that teachers' poor professional skills with using educational technologies have a negative impact on their effective use of interactive whiteboards with LD students. This may be due to insufficient instruction on how to use educational technologies, inadequate and insufficient information about these technologies, and poor understanding of how to employ them in the educational process. Therefore, it is necessary to conduct continuous workshops for teachers to provide them with the knowledge required to acquire the necessary skills. Insufficient material and moral support and the failure of administrations to recognize the effectiveness of interactive whiteboards (and the use of other educational technologies), in addition to the absence of continuous technology courses during the school year, negatively impact the education process.

The results of the current study are consistent with those of Al-Muqbil (2019), who argued that a lack of administrative support for teachers, material or moral, is one of many administrative obstacles. The results of the study also indicated that teachers with a master's degree made greater use of interactive whiteboards than the other groups. The researchers explained that teachers with a master's degree are more research focused and keep abreast of the latest effective methods and techniques in education. Teachers who hold higher qualifications are more aware of how to follow the instructions for working with interactive whiteboards and how to use the devices efficiently. Therefore, teachers should be encouraged to obtain a master's degree. The results also indicated statistically significant differences in the use of interactive whiteboards attributable to the teachers' years of experience. Those with more experience (> 10 years) reported better. Teachers with more years of experience in the educational field have higher skill levels. Thus, they are better at innovating and changing their traditional teaching methods upon hearing of or being introduced to recent technologies.

5.1 Recommendations

The current study recommends urging teachers to pursue further education beyond a bachelor's degree and to obtain their master's or PhD in special education. Additionally, teachers should be educated on the importance of interactive whiteboards in the educational process and their effective impact on the educational process. Furthermore, administrations should be made aware of the effectiveness of teachers' use of interactive whiteboards when working with students and should encourage teachers to use the whiteboards and keep abreast of the most recent developments in education. The appropriate authorities should provide incentives to those teachers who use interactive whiteboards on a regular basis and should employ a specialized technician to address malfunctions and provide courses and workshops for teachers on how to use the technology.

5.2 Suggestions for future research

Similar studies should be conducted to identify the obstacles that teachers in other cities face when using interactive whiteboards to teach LD students. Experimental studies on the impacts of using interactive whiteboards on LD students are also recommended to educate teachers about the importance and impact of interactive whiteboards on the educational process. Finally, other qualitative studies should be conducted to determine the obstacles that teachers face when using interactive whiteboards to teach LD students.

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