Utilizing PROKET Technology Program: An Evaluation of Assistive Tools in Enhancing Developmental Skills for Students with Specific Learning Disorders

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***Abstract*—This study evaluates the PROKET Technology Program's efficacy in aiding students with Specific Learning Disorders (SLD) in enhancing their developmental skills, focusing explicitly on attention and memory by employing an experimental design and individual case study method. A total of 15 students were enrolled in the study who had specific learning disabilities in Amman, Jordan. PROKET is an interactive digital learning program based on OSMO principles. Additionally, it provides training and assistance with assistive technology. It combines physical action with artificial intelligence to develop confidence, thoughtfulness, and creativity. As part of the PROKET, developmental difficulties in attention and memory are targeted and measured specifically. As a result of the study, it has been shown that PROKET has a significant positive effect on students with specific learning disabilities with regards to arithmetic means on pre- and post-tests for each of the performance measures on developmental difficulties as a whole.**

***Keywords*—assistive technology, PROKET technology program, specific learning disorders, attention and memory**

I. Introduction

Technology has become an integral part of all aspects of modern life as a result of the rapid development of technology-based knowledge. In addition to being a fundamental human right, education is also part of the fourth sustainable development goal, and it is unquestionably one of the most critical sectors that should receive attention at the national level. A distinguished education based on technology will create generations capable of innovation and leadership, contributing to the prosperity of civilization [1, 2]. Moreover, it is essential for the education system to extend beyond just ordinary students and must provide all students with special needs, especially those with specific learning disabilities, a safe and integrated learning environment. This approach is a foundational pillar in the evolution of education. Hence, the appropriate education will undoubtedly contribute to the development of their cognitive, social, functional, and professional abilities, which will enable them to be active participants in the development of their societies in the future. Assistive technologies are crucial for enhancing educational processes, especially for individuals with disabilities, and this is no longer a secret to anyone.

What is more, it contributes to the creation of modern educational environments that fit their abilities as well as their development of their knowledge growth and skills: mental, sensory, linguistic, and motor skills. It contributes to the improvement and quality of education. As a result, many countries around the world are racing to develop and employ assistive technology in their various programs [3, 4].

As defined by the American Psychiatric Association [5], a learning disorder is a neurodevelopmental disorder that adversely affects one's ability to learn or apply specific academic skills (such as reading, writing, or arithmetic) in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition. A defect in the nervous system is also believed to be responsible for specific learning disabilities. The nervous system is the foundation for academic success. Information is received, processed, or transmitted as a result of this defect. Several researchers (American Psychiatric Association, DSM-5, 2013) [5] have identified specific learning disorders as difficulties related to reading, writing, arithmetic, spelling, and oral expression [6–8]. Additionally, most children with academic learning difficulties are characterized by developmental difficulties. Developmental difficulties include disorders of attention, perception, memory, thinking, and language, and are often overlooked when identifying children in modest educational systems. As a prerequisite for academic success, a person must possess essential development skills such as attention, memory, perception, motor coordination, and eye-hand coordination. Initially, attention is the first step towards learning; however, if students do not pay attention, they cannot comprehend material that they do not already comprehend or know [9, 10].

An estimated 20% of children with learning disorders have attention-related issues, which are characterized by difficulties such as inability to focus, increased activity, and impulsiveness [11]. As part of the learning process, cognitive processes and memory play an important role in applying, storing, processing, and retaining information as well as implementing some important logical processes and modifications to that information. Learning is entirely dependent on retaining information, which is facilitated by both short-term and long-term memory [12–14]. As a result of memory impairment, children suffer from problems in thinking, poor reception, a lack of attention, and insufficient language development. Moreover, these children have difficulty recalling what they have seen visually due to their poor visual memory. They are also incapable of utilizing

memory techniques. Furthermore, they are unable to retain new information as well as mathematical facts. Specific learning disorders are characterized by these characteristics, which necessitate cutting-edge educational programs that are current with the times, their needs, and the children's needs [15–17].

Many developing countries, including Jordan, are experiencing significant challenges in teaching students with specific learning disorders. This difficulty stems primarily from the limited availability of assistive technologies and the challenges associated with their application, a situation that several studies have confirmed [18–22]. Additionally, studies such as Abu-Hamour and Al-Hmouz [23] indicate that 33.3% of Jordanian school-age children have learning difficulties, with most students showing a combination of all learning conditions. As well, a study by Abu-Hamour [24] showed that approximately half of the students in Jordan with Learning Difficulties exhibit challenging behaviors. Due to Jordan's current economic and political situation, it is extremely difficult to provide and utilize assistive technology to children with specific learning disorders, and it is not a priority for education at this point in time. This lack of emphasis will adversely affect their learning and development, as they require a variety of learning approaches, teaching methods, and programs in order to succeed. Due to these challenges, the purpose of this study is to demonstrate the effectiveness of PROKET Technology in developing the developmental learning skills of students with specific learning disabilities.

II. Literature Review

The increasing adoption of assistive technology in educational settings has elevated its significance to one of the foremost global issues. A number of studies have examined how assistive technology can be utilized in education, especially among people with disabilities. As well, there have been several studies evaluating the effectiveness of assistive technology in assisting students with a particular learning disorder in various countries, such as [25–27]. There have been very few studies that have examined assistive technology in the Arab world and related it to major issues. Several aspects of the importance of implementing assistive technology in the learning environment are discussed in literature [28]. As well as highlighting the key components of inclusion achieved by utilizing assistive technology, the study suggests that assistive technology can be an effective tool for students with learning disabilities due to its potential contribution. Additionally, the current study concluded that assistive technology can improve the academic performance of students with disabilities by implementing a variety of technologies.

There has been a substantial effect on the academic achievement and motivation of students with learning difficulties in primary school in Doha, State of Qatar, by utilizing educational technology in the fourth grade for mathematics, as well as improving their motivation to learn. Those students with learning difficulties who were included in the study population were enrolled in recourse rooms in their first semester of the 2019/2020 academic year. The mathematics achievement test also revealed a statistically significant difference between the experimental and control groups, which indicates that the participants were highly motivated to learn mathematics [21].

An evaluation of the effectiveness of a computerized program in improving reading comprehension among students with learning disabilities was conducted by Al-Ramamneh and Al-Hadidi [22] The study consisted of a sample of 40 students living in Salt residential rooms. Post-test results demonstrated significant differences between experimental and control groups, both in terms of overall scores as well as literal, deductive, and applied scores. Additionally, the results showed no significant differences in reading comprehension between males and females. A study by Tawat [29], aimed at determining whether the proposed therapeutic program is effective in treating developmental difficulties (attention, perception, memory, and language) as well as in preventing academic difficulties (reading, writing, and arithmetic). Moreover, it was found that the program demonstrated distinct effectiveness both in a curative and a preventive capacity.

By increasing or improving functional ability, assistive technology is one of the integrated support systems that allows people with special needs to access the world around them. As well, specialist or educator must consider the individual needs of each individual when determining the need for assistive technology services. such as self-care, sensory information processing, communication, and mobility. References [1, 30, 31] define assistive technology as the technology that enables people with special needs to perform activities that they would not be able to perform without using these tools, such as talking books, talking computer programs, electronic applications, etc. Furthermore, assistive technology is divided into two categories: assistive technology tools and assistive technology services.

Over the last few decades, assistive technology has undergone numerous developments. Each disability has its own specific assistive tool. Broadly, it is possible to divide these tools into two categories: the first is simple technology; these devices lack technological advancement, do not require electricity or specialized programming, and are relatively inexpensive. Sticks for the visually impaired and grips for pen-holding are examples of devices that are still in use today as they provide independence through straightforward means and are readily available. As for the second type, it is an advanced assistive technology that relies on smart, complex, and highly complex technology to compensate the individual for the missing organ in a manner that allows him to continue living his normal life, but these technologies are expensive and not available to everyone, such as performing surgery for cochlear implants. Each of these programs is designed to provide opportunities for people with special needs to interact with their surroundings so that they can progress and become independent, and that disability does not prevent them from moving forward with their lives [31–34].

Through the use of assistive technologies, students with specific learning disorders have been able to develop their academic and social skills, which has contributed to their psychological and social adjustment by allowing them to study more and gain diverse experiences. Assistive technology has been utilized to enhance the lives of

individuals with specific learning disorders through the use of the following examples. With the use of assistive technology for teaching reading and writing, written text is presented in an audible manner by means of computerized devices or programs that convert written text into audio. This includes talking electronic pens and computer programs that enlarge printed text or read it automatically. Children learn basic skills by making use of a computer or any device that assists with writing by making some modifications to it to provide the process of correcting spelling errors, especially in the elementary level. As well as recording and storing text or lessons, there are also many devices that have the feature of enabling people with learning disorders with perception and memory difficulties to refer to the recordings at any time, etc. [31–37].

In the Jordanian context, studies as Al-Dababneh and Al-Zboon [38] indicated that the teachers' self-reported use of assistive technologies in children with SLD's curriculum was high. As well, improvements in students with specific learning disorders were seen when assistive technology was implemented properly. As well, teachers with positive beliefs and sufficient training to teach students were employed and encouraged to do so. Furthermore, Alanazi [39] examined the use of assistive technologies in special education contexts in Arab speaking countries and concluded that assistive technologies have become an essential component of encouraging inclusive education, thereby helping and supporting students in learning. However, this issue remains unaddressed due to a lack of resources, awareness, and training. Further, countries such as Morocco, UAE, and Tunisia have established and developed centers and programs to assist students who are having difficulty learning in general by implementing assistive tools. Although more efforts should be made and more research studies should be conducted to benefit teachers, students and specialists in this field, assistive technologies should be included in special education. It was found that Khalil and Yasmeen [40] reviewed the role of assistive technology in aiding children with disabilities in the middle east and north Africa. As a result, there are barriers, including the absence of appropriate learning environments that can facilitate student performance, as well as a lack of awareness and governance within this context. Therefore, more studies and projects should be conducted to improve the use of assistive technologies by students who have specific learning disorders.

The OSMO Program [41]: Foundation for the PROKET Technology Program—was created in 2013 by Pramod Sharma and Jerome Scholler. In designing something that inspires the youngest generation and offering a creative solution that addresses parents' concerns regarding getting their children to interact with technology while still promoting hands-on play, they attempted to address those parents' concerns. Furthermore, Tangible Play Inc. was established and operated under the OSMO brand. Using brain research and educational psychology, the program was designed with technology in mind. And as part of OSMO program, the iPad camera is used for technology, artificial intelligence, and simulation, and sensory elements accompanying each game are included, including puzzle pieces, picture pieces, colored pens, sticks, and other objects. Thus, the program activates the use of sensory, visual, and auditory skills simultaneously and strengthens the connection between technology and sensory perception. Furthermore, two categories of children are targeted by the OSMO program:

1) A beginner's category containing four games: The Visual-Kinetic Synergy Game, the Letter Recognition Game, the Perception of Clothes and Colors, and the Stories.
2) There are four games in the expert category, each game contains a set of levels ranging from the easiest to the most difficult, as well as other games included in the program that have been added and updated.

III. Materials and Methods

A. Method and Research Sample

The current study utilized a combined methodology comprising a one-group experimental research design and an individual case study approach where an observation checklist was used. This study included 15 students (8 males and 7 females), all of whom had been formally diagnosed with a specific learning disability. At the Education Challenges Center in Amman in the primary stage. In addition to this, the Education Challenges Center and Amman Arab University approved the study for the academic year 2021 to 2022, in which the students participated in a training program. Moreover, written consents were obtained from the parents and guardians of the participating students before the acquisition of students' information and prior to the acquisition of the data. The anonymization of student information also ensured that academic confidentiality was maintained. What is more, the number of the participants was limited due to the specify of the diagnosis since the focus on the study was on the students diagnosed with specific learning disorder which could ensure a homogenous group, as well, PROKET Technology Program was able to achieve maximum benefit for each student with a limited number of students, while maintaining the integrity and validity of the program.

B. Construction and Implementation of Study Tools

1) Diagnostic rating scales battery for learning disabilities

For the purpose of achieving the objectives of the study, a diagnostic rating scale battery for learning disabilities was developed based on AL-Zayyat [42] and based on observed classroom behavior, this battery was used as an evaluative instrument. The battery was modified and developed to include two scales for measuring personal development skills: The Attention Difficulties Scale and the Memory Difficulties Scale.

2) Validity and reliability of the scale

The scale used in the study was evaluated based on the clarity of its words and the meaning they convey in the paragraphs that are part of its dimensions. Moreover, a comprehensive process was undertaken by a panel of six experts in special education, educational psychology and educational measurement and evaluation were selected based

on their extensive experiences in the field. As well, an in-depth review of the scale was conducted by them in order to ensure the relevance and appropriates of the scale for the target population of the study. The items were revised and edited by the experts' comments. As indicators of validity of the internal consistency of the items on the scale and its dimensions, Pearson correlation coefficients as well as Corrected Item-Total Correlations (Bierial) were calculated for the relationship between the items and the scale and its dimensions. Table 1 shows Pearson and Biserial Correlation Coefficients of Scaled Items with Their Dimensions.

Table 1. Pearson and Biserial Correlation Coefficients of scaled items with their dimensions

The dimension and items		Pearson		Biserial	
		dimension	Scales	dimension	Scales
Attention Difficulties	1	0.85*	0.82*	0.81*	**0.81***
	2	0.83*	0.74*	0.77*	**0.69***
	3	0.85*	0.69*	0.81*	**0.68***
	4	0.69*	0.57*	0.60*	**0.54***
	5	0.93*	0.81*	0.90*	**0.79***
	6	0.89*	0.81*	0.86*	**0.79***
	7	0.79*	0.63*	0.74*	**0.62***
	8	0.75*	0.63*	0.66*	**0.62***
	9	0.69*	0.49*	0.61*	**0.47***
	10	0.90*	0.78*	0.86*	**0.76***
Memory Difficulties	1	0.75*	0.71*	0.68*	**0.69***
	2	0.87*	0.75*	0.83*	**0.73***
	3	0.76*	0.76*	0.68*	**0.73***
	4	0.70*	0.63*	0.61*	**0.60***
	5	0.88*	0.81*	0.82*	**0.78***
	6	0.87*	0.70*	0.85*	**0.69***
	7	0.76*	0.73*	0.72*	**0.70***
	8	0.70*	0.65*	0.64*	**0.61***
	9	0.88*	0.67*	0.83*	**0.63***
	10	0.89*	0.89*	0.86*	**0.88***

*Significant statistically (α = 0.05)

Considering the findings presented in Table 1, it is evident that the items within the scale are valid and consistent based on their dimensions. As a result of the statistical significance of the items within the scale dimensions, it is evident that they are qualitatively sound and valid. As shown in Table 1, the items of the scale show a strong correlation with their dimensions. And the correlation coefficients exceed the threshold of significance (α = 0.05), indicating that the scale has a high level of validity. Additionally, the Cronbach's alpha equation and the test-retest method were used to assess the reliability of the study tool. Moreover, Table 2 illustrates an assessment of the scale's internal consistency in terms of stability.

Table 2. Reliability measures: Cronbach's Alpha and test-retest for the scale

Scale dimensions	Items	Stability coefficient	
		re-test	Cronbach's alpha
Attention Difficulties	10	0.88*	0.95
Memory Difficulties	10	0.84*	0.93
Total	20	0.87*	0.97

*Significant statistically (α = 0.05)

In the test-retest application, the correlation coefficients for the scale items ranged from 0.84 to 0.88, with an overall correlation coefficient of 0.87. These figures are considered appropriate for the study's objectives. For the items of the diagnostic rating scale battery for learning disabilities, Table 2 indicates Cronbach's alpha values ranging between 0.93 and 0.95, with a composite score of 0.97. In accordance with Vaske *et al.* [43], a Cronbach's alpha value over 70% indicates a test is reliable, valid, and stable.

C. Correction of Diagnostic Rating Scales Battery for Learning Disabilities

Taking into account the validity findings for the construction, the final form of the scale included twenty items, which were assessed with a "Likert scale" consisting of five alternatives to assess the degree to which the item content could be applied to the student assessed by the researcher. They are: (always), which is given a score of (4) when corrected. (often), which is given a score of (3) when corrected. (sometimes), which is given a score of (2) when corrected. (rarely), which is given a score of (1) when corrected, or (not applicable), which is given a score of (0) when corrected. In this study, the raw scores for developmental learning difficulties in students with specific learning disorders ranged from 20 to 80. And they ranged on two dimensions between 10 and 20 on the scale. Based on study findings, high raw scores on the scale, along with related dimensions of attention and memory difficulties, correlate with greater developmental learning challenges. Therefore, lower raw scores indicate fewer developmental difficulties and less severity in the measured dimensions.

Accordingly, the researchers determined that the raw scores from the assessment could be classified into four diagnostic conclusions regarding the performance of students with specific learning disabilities on the scale and its dimensions. The relative scaling model has been employed. As follows: "extreme" for those with a raw score ranging between (60–80), category length (15.0–20.0). In addition, "intermediate" for those with a raw score ranging between (40–60), category length (10.0–15.0). "Simple" is for those with raw scores between (20-40), category length (5.0–10.0), and "normal" or "no difficulty" for those with raw scores between (0–20), category length (0–5.0). This is determined by the degree to which the paragraphs of the scale with dimensions are answered correctly.

D. Introduction to the PROKET Technology Program

The study aims to design an educational and training program based primarily on the use of technology. In addition, the program was built based on an international program (OSMO). It has been named the "PROKET Technology Program". Moreover, children with specific learning disabilities will be able to improve their attention and memory skills, the program will also increase their sensory and technical interaction and motivate them to learn.

As part of the global OSMO program, the researchers selected a group of games based on the opinions of specialists and experts in psychology, educational technology, special education, curricula, and teaching methods who confirmed their suitability. Additionally, following a review of educational literature demonstrating that the games contained in the program are suitable for improving children's developmental skills, the program was chosen. In particular, those targeted in the study were downloaded on iPads after they had completed Arabizing. In addition to the practical parts, the child can also play with them as he simulates the

basic game he watched through the iPad. There were 12 games identified in this project, divided into two skills, "Attention and Memory", graded from easy to difficult and in stages, and each skill was divided into eight games. Additionally, a set of training sessions were designed based on a specific program, with specific time periods ranging from 35 minutes to 45 minutes for each session. For the best possible implementation of the sessions, a set of general procedures and rules was developed. Furthermore, appropriate evaluation methods were developed to evaluate students' performance after each session to provide continuous feedback.

E. The Observation Checklist

A group of six experts in special education, educational psychology, and educational measurement and evaluation, chosen for their comprehensive field experience, validated the items on the observation checklist. They also thoroughly reviewed the checklist to verify its suitability and applicability for the intended study group. The purpose of employing the observation checklist was to document and track the aspects of the students' interactions with PROKET Technology Program such as students' concentration and inattention as well as their abilities to recall information during the learning sessions. What is more, the observation checklist helped to notice the aspects of the observed behaviors such as attention and memory which helped to draw conclusions about the impact of the PROKET Technology Program.

For the purpose of verifying the validity of the proposed training program, a group of experts, researchers, and specialists were consulted from special education, psychology, educational technology, curricula and teaching methods, and measurement and evaluation. A variety of educational sectors, including universities, research centers, and research centers, are represented among these professionals. In addition to providing feedback on the program's objectives, content, session details, titles, durations, implementation procedures, and evaluation methods, they also provided feedback on the training program's implementation procedures. The program included observations that were agreed upon by at least 85% of the arbitrators.

IV. Result and Discussion

In this section, the results of the study are examined and discussed, attempting to answer the hypothesis of the study, which states: demonstrate the effectiveness of the PROKET Technology Program in developing students with specific learning disabilities' developmental learning skills (attention and memory). A t-test was performed for correlated samples in order to determine the significance of a difference between pre- and post-measure arithmetic means in terms of the development difficulties in their dimensions (Attention and Memory) in light of their two standard deviations for students with specific learning disorders. Using Hedges' g correction for samples smaller than 50 individuals, the Cohen's effect size was adjusted for the Standardized Means Difference. Then, the explained variance was calculated of this effect size and compared the improvement in performance between pre and post measures, considering the highest degree of developmental difficulty and its dimensions, as presented in Table 3. This table presents the results of a t-test comparing the arithmetic means of pre- and post-measurements for students with specific learning disabilities on developmental difficulties and their dimensions. In addition to the corrected effect size, the variance explained, and the percentage improvement between the pre- and post-tests are included.

Table 3. The results of a t-test comparing the arithmetic means of pre- and post-measurements

Observation checklist	Measurement	Arithmetic average	Standard deviation	T	Hedges' g correction Cohen's effect size			Correlation coefficient	Improvement ratio
					V	Variance	R		
Attention	Pretest	25.07	6.62				a huge	0.98	
	Follow up testing	21.00	7.28	9.97*	2.42	77.26			10.18
Memory	Pretest	28.40	6.03				a huge	0.93	
	Follow up testing	24.69	5.89	6.34*	1.55	61.16			9.33
Total scale	Pretest	77.87	16.87				a huge	0.97	
	Follow up testing	63.96	17.50	11.96*	2.94	82.5			11.62

*Significant statistically ($\alpha = 0.05$)

The pre- and post-measurement arithmetic means of students with specific learning disorders differ significantly in regard to developmental difficulties in both attention and memory dimensions. The post-measurement performance showed 63.96 for overall developmental difficulties, 21.00 for attention difficulties, and 24.69 for memory difficulties, all lower than the respective pre-measurements. The values indicate a pronounced positive trend, with a total of 2.94 for developmental difficulties overall, 2.42 for attention, and 1.55 for memory. Based on these results, 11.62% of all difficulties were improved, 10.18% were improved for attention, and 9.32% were improved for memory. The results of this study align with those of Bryant *et al.* [44], who advocated the use of assistive technology devices and services to enhance access to the general education curriculum for learners with disabilities. Students diagnosed with specific learning disorders (Attention) are provided with pre- and post-measurement results, as well as their respective improvement percentages in Table 4.

According to Table 4 above, all improvement rates were positive. The student (No. 1) had the highest improvement rate, and the two remaining students (Nos. 2 and 5) had the lowest improvement rates. Fig. 1 illustrates the results of the pre- and post-measurements of students with a specific learning disorder on (Attention) and the percentages of improvement on the post-measurement in comparison to the pre-measurement.

Table 4. Pre- and post-measurement results of students with specific learning disorder (attention): Individual performance and percentage improvement

No.	Pre-measurements	Post-measurements	The percentage of improvement (%)
1	13	20	17.6
2	34	36	5.0
3	14	17	7.5
4	17	23	15
5	11	13	5.0
6	32	35	7.6
7	19	24	12.8
8	27	30	7.6
9	14	20	15.2
10	23	26	7.7
11	16	22	15.0
12	29	33	10.0
13	19	23	10.0
14	27	30	7.8
15	20	24	10.0

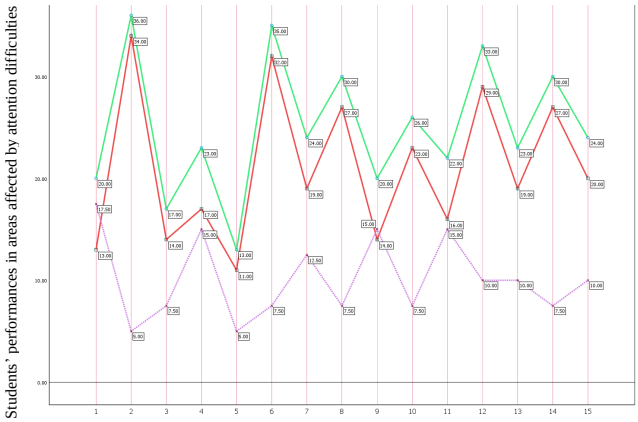

Fig. 1. The pre- and post-measurements of the performance of students with a learning disorder of attention and the rates of improvement for it.

In Table 5 below, the results of the pre- and post-tests of the memory performance of students with a specific learning disorder are presented for each student and the percentage improvement in the post-test compared to their pre-test.

Table 5. Results of pre- and post-measurements for students with specific learning disorder (memory): Individual performance and percentage improvement

No.	Pre-measurements	Post-measurements	The percentage of improvement (%)
1	30	33	7.6
2	25	30	12.5
3	15	18	7.5
4	28	30	5.0
5	15	20	12.5
6	34	35	2.6
7	22	28	15.0
8	32	37	12.5
9	19	22	7.7
10	23	26	7.5
11	23	23	0
12	32	34	5.0
13	24	30	15.0
14	21	24	7.6
15	**27**	**36**	**22.5**

According to Table 5, all improvement rates were positive. The student with the highest improvement rate (No. 15) and the lowest improvement rate (No. 6), with the exception of the student with the lowest improvement rate (No. 11), who had no improvement or decline in his post-measurement memory difficulties. Fig. 2 illustrates the results of the pre- and post-measurement performance of students with learning disorders in memory and their improvement rates.

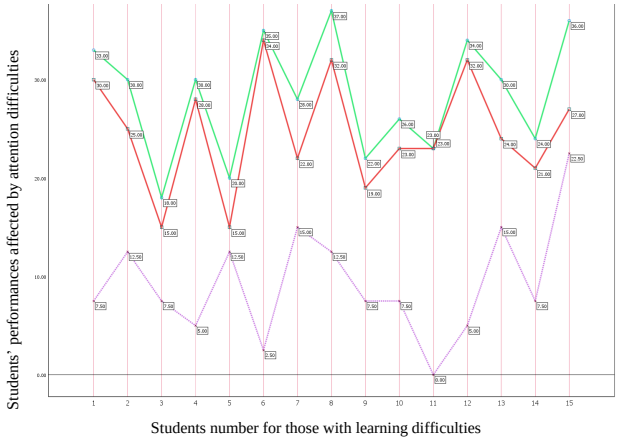

Fig. 2. Pre- and post-measurement performance of students with learning disorders in memory and their improvement rates.

As well, the analysis of the data obtained from the observation checklist showed that there was improvement in the students' attention and memory as it were assessed before and after the intervention as shown in Table 6 below.

Table 6. PROKET program impact on attention and memory: Pre vs. Post intervention

Observation checklist	Pre-intervention		Post-intervention		*p*-value
	Mean	SD	Mean	SD	
Attention	2.4	0.6	3.1	0.4	<0.001
Memory	2.2	0.7	2.9	0.5	<0.001

Based on Table 6 above, it is clear that the obtained data from the observation checklist of post intervention which is 3.1 for Concentration and Attention are higher than the pre which are 2.4, as well, the results of post intervention on the recall information and memory are higher than the pre-intervention. As well, the results of the *p*-value which are (<0.001) for both items indicate that the differences between pre- and post-intervention mean scores are statistically significant which supports the pervious results.

Based on the previous results, it is clear that the application of the PROKET Technology Program had a significant and statistically significant effect, based on the average rankings of the pre- and post-measurements on the developmental difficulties scale as a whole and its dimensions (Attention and Memory), which were applied to students with specific learning disabilities which align with studies stating that employing assistive technologies with people with specific learning disorders and people with disabilities can improve their skills and improve their skills [26, 45, 46]. In addition to taking into account the characteristics of students with specific learning disorders, the program contains a variety of exercises designed to improve basic cognitive skills and higher mental skills, critical for the development of academic performance. This program is effective since it takes into account the characteristics of students with specific learning disorders. The majority of students in this sample were not trained in these skills prior to being diagnosed with a specific learning disorder; rather, they focused on academic skills.

In addition to taking individual differences into consideration in the training program, the student can move in the program according to his abilities and preparations and avoid attempts to fail as much as possible. As a result, the group of children targeted in this study displayed distinct

differences in their ability to acquire skill. As well, in addition to the novelty and the use of iPads for learning, the program is also based on fun educational games that provide immediate reinforcement, stimulate the desire to learn in students, attract their attention, and motivate them to learn more knowledge by stimulating their desire to win. What is more, during the implementation of the program, it also significantly impacted their happiness and enjoyment. Interestingly, the program used the senses of hearing, vision, and touch together at the same time in order to stimulate more than one sense. As well as being a fundamental principle and basic of active learning, it is considered one of the most important ways to motivate and teach students with a specific learning disorder. There is some congruence between the findings of this study's hypothesis and the subsequent studies [21, 22, 28, 29].

In this study, the integration of PROKET Technology Program significantly improved the development of students with specific learning disorders in terms of attention and memory, particularly for students with specific learning disorders. Moreover, it is imperative in future research to consider external factors that may contribute to the improvement of students, including teachers' support and learning environments. As well, the encouraging results of this study suggest exploring more assistive technologies that can increase students' motivation and engagement. In addition, we suggest combining assistive technologies with other educational strategies to enhance students' developmental learning skills by enhancing the development of assistive technologies.

V. Conclusion

In this study, the role of assistive technology in improving the educational experiences of students with specific learning disorders was illuminated, especially in light of the challenges posed by COVID-19. The present study demonstrated that students' skill and abilities improved significantly across several educational contexts through the use of technologies such as virtual reality, augmented reality, holograms, mixed reality, and educational games. In addition, utilizing the PROKET Technology Program has led to a remarkable development, showing a customized approach to accommodating learners with specific learning disabilities by utilizing a multifaceted approach to developing skills for learners. It was found in this study that assistive technologies contribute to improving the attention and memory skills of students by bridging the gap between traditional and modern teaching methods. However, the study acknowledged that one of its limitations is that its results may not be generalizable as they are limited to a specific demographic. The study also recommended that a larger sample size be used and that comparative studies be conducted to compare the PROKET technology program against other programs in order to facilitate student learning as well. These efforts will be crucial to the further validation of the effects of assistive technologies, such as the PROKET program, on students with learning disabilities.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

S.A., H.A.G., and A.H. were responsible for conducting the research and collecting data. Together with W.A.E., they also wrote and developed the literature review. The data analysis was carried out by S.A and A.H. Additionally, S.A., H.A.G., and A.H. were involved in developing the study instruments. The discussion of the results was written by S.A., A.H., H.A.G., and W.A.E., who also collectively revised all sections of the manuscript. All authors have reviewed and approved the final manuscript for publication.

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