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ARTICLE

The Impact of Multiple Intelligences Strategy on Enhancing Reading Comprehension Skills among Students with Learning Difficulties

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ABSTRACT

While multiple intelligences theory has been widely utilised in a variety of educational contexts, its application to students with reading comprehension challenges is a relatively new field of research. This study investigates the impact of using the multiple intelligences strategy on improving reading comprehension skills among students with learning difficulties in the English reading subject. The total population was 412, from which a sub-sample of 62 students was selected and randomly assigned to the experimental and control groups. The results showed statistically significant differences between the performance of the experimental group, which was taught using the MI strategy, and the control group, which was taught using the traditional method, on the post-test of reading comprehension in the domains and the total score, in favor of the experimental group. This indicates the effectiveness of using the MI strategy in improving reading comprehension skills among students with learning difficulties. The study helps better understand how multiple intelligences can be used in the classroom to improve learning outcomes for these students. It contributes to the current body of knowledge by providing

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empirical evidence of multiple intelligences efficacy in addressing the unique issues encountered by these students. The study recommends that teachers employ multiple intelligences strategies in the classroom to meet the diverse needs of their students and improve their reading comprehension abilities. This has the potential to improve students with reading comprehension challenges' educational outcomes and provide them with better learning strategies that can be applied in other areas of their education.

Keywords: Multiple Intelligences; Reading Comprehension; Learning Difficulties; Educational Strategies; Differentiated Instruction; Special Education; Cognitive Development

1. Introduction

Language is a fundamental tool for thinking and communication among individuals. Language education programs aim to develop linguistic skills, such as vocabulary knowledge that evolves day by day among students[1–3]. Language teaching curriculum covers the four language skills—listening, speaking, reading, and writing—and places a strong emphasis on objectives, content, educational activities, teaching procedures, and evaluation techniques. Because language education is so important, efforts are always made to improve different instruments in order to develop their programs and curricula[4–6]. One of the biggest issues facing educators is helping students with learning disabilities (SWLD) develop their reading comprehension skills.

A key component of education is reading comprehension, which gives students the ability to engage with texts and understand information. This helps them acquire a solid foundation of knowledge that improves both their social and intellectual abilities. Multiple intelligences technique becomes an effective tool for improving reading comprehension[7–10]. In order to develop students' reading skills and make learning fun and interesting, this strategy focuses on varying teaching approaches to account for the variety of intelligence styles among students. Empirical studies reveal that the implementation of varied educational activities that integrate linguistic, logical, spatial, and bodily-kinesthetic intelligences can yield notable benefits for students' reading comprehension, motivation for learning, and retrieval and application of information in a variety of real-world contexts[11–14].

Schools have long recognised students who struggle with learning. As long as there is education, there will be children who struggle to learn. Children who fail in education have often been considered lazy, negligent, or unintelligent, but this is a mistaken assumption[15–17]. It does not mean that the child is not diligent, intelligent, or capable of learning. SWLD do not show unusual physical symptoms; they are normal in intellectual capacity and do not suffer from hearing, visual, mental, or health impairments. However, they are unable to learn basic skills and academic subjects such as speaking, reading, writing, or arithmetic, or developmental skills like attention, memory, perception, understanding, and comprehension. The primary cause of these difficulties is assumed to be dysfunction in the central nervous system. Therefore, these students need educational and therapeutic assistance to help them with their problems[18–22].

Reading difficulties are the most impactful for children with learning difficulties, affecting all written skills, short-term memory, sequencing, letter discrimination, word recognition, listening comprehension, and expressive language[23–27]. Comprehension is the ultimate goal of the reading process, a process of forming meanings that arise from the integration of information provided by the author and the reader's background knowledge. Students must be trained in these skills through appropriate texts, which help them break down the material and connect its parts. Reading comprehension errors among students include the inability to recall simple facts from a text, follow the correct sequence in retelling a story, or recall the main title of the read story[28,29].

There are three main levels of reading comprehension, which are: Literal or direct comprehension (understanding information, and events); inferential comprehension (the ability to link meanings and infer the relationship between ideas); critical comprehension (judging the reading material linguistically and functionally, evaluating its accuracy, and impact on the reader according to appropriate standards); appreciative comprehension (an aesthetic experience reflecting the reader's emotional response to what writer felt); creative

comprehension (using facts, information, and concepts to arrive at new solutions to problems presented in the text or predict new ideas that can be judged as correct or incorrect) [28–30].

Students must possess these levels and skills to understand and apply the reading material presented and comprehend the texts contained in textbooks. Thus, the importance of developing comprehension skills for students lies in following strategies that enhance their level of thinking, including the multiple intelligences (MI) strategy. This strategy enables teachers to use various teaching activities and content that accommodate the differences in learning styles and the strengths and weaknesses of students, as well as their learning needs [29,30].

1.1. Problem Statement

SWLD are considered one of the largest groups in special education, according to the American Department of Special Education (2000), with a higher percentage among males than females. Therefore, teachers need methods, ideas, and methodologies that succeed in teaching SWLD, and one of the most important is the teaching methodology based on the theory of MI, which is beneficial for all general education classrooms and particularly for SWLD. Reading is an important skill a child learns in school, and the student's need to understand written language and express themselves through regular school learning is crucial. Comprehension is the ultimate goal of the reading process and the culmination of many different skills, and the key to success is helping the child develop reading accuracy, fluency, and speed. Therefore, it is essential to focus on developing reading comprehension skills among students by improving various thinking skills and following strategies that enhance thinking levels and utilise the different intelligences and abilities of students.

Thus, this study aims to highlight the impact of the effectiveness of teaching activities and strategies based on the MI strategy in developing reading comprehension skills among SWLD in light of the need to shift from traditional teaching to using modern teaching strategies that consider individual differences and believe in the diversity of learning styles and different abilities among students, addressing their intelligences [29,30]. This is accomplished by creating cutting-edge instructional activities that are customised to fit the unique requirements of each student and assist them in overcoming obstacles related to the reading process. This method encourages kids to learn more efficiently and increases their self-confidence, which eventually improves their social and academic performance.

1.2. Research Questions

The study attempts to answer the following questions:

- Are there statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the experimental and control groups in developing reading comprehension skills attributed to the multiple intelligences teaching strategy?
- What is the effectiveness of the multiple intelligences strategy in improving reading comprehension among SWLD?

1.3. Importance of the Study

The study demonstrates how well educational strategies and activities based on MI can improve reading comprehension abilities in children who struggle with learning. The study highlights the necessity of moving away from old teaching methods and toward more contemporary ones that take into account the unique differences between students and make use of a variety of learning styles and skill levels. The main research questions seek to ascertain whether teaching strategies based on MI are effective in improving reading comprehension among SWLD and whether there are statistically significant differences between the means of grades in the experimental and control groups in terms of improving reading comprehension skills.

1.4. Limitations and Future Directions

This study is subject to several limitations. First, the sample size was relatively small, which may limit the generalizability of the findings to broader populations. Second, the duration of the intervention was short-term, making it difficult to assess the sustainability of the improvements in reading comprehension over time. Future research should consider conducting longitudinal studies to examine the long-term impact of MI-based interventions. Moreover, expanding the sample to include diverse educational contexts and age groups would enhance the applicability of the results.

Researchers are also encouraged to explore how integrating MI strategies with digital learning tools can support differentiated instruction and promote engagement among students with learning difficulties across subjects.

2. Literature Review

2.1. Theoretical Framework

Gardner and Moran's[31] theory of MI, among the modern concepts that have emerged in educational psychology, represents a revolution in classifying students on the intelligence scale. This theory presents a concept based on the idea that all students are capable of learning according to diverse types and degrees of intelligence, necessitating educators or educational leaders to search for suitable methods for prevailing intelligence patterns among students or participants in various educational contexts. This theory is a fertile field for research and the development of educational programs and professional development programs.

The theory of MI has shifted the concept of intelligence and learning from a singular and traditional view to a modern perspective that emphasises the positive capabilities of students in the educational context, where students possess diverse intelligence patterns enabling them to adapt to various educational challenges. The applications of this theory highlight significant importance in enhancing teaching strategies to achieve maximum educational benefit for students[31].

Gardner and Moran's[31] Theory of MI describes the diverse learning needs of students in terms of different abilities and how teachers understand students' learning and plan lessons, and educational activities according to these intelligences. These intelligences include different cognitive abilities aimed at improving learning, which Gardner and Moran[31] referred to as eight independent types: linguistic-verbal intelligence, logical-mathematical intelligence, musical intelligence, spatial intelligence, bodily-kinesthetic intelligence, naturalistic intelligence, interpersonal intelligence, intrapersonal intelligence, and the potential ninth, moral intelligence. These intelligences encompass interactive cognitive abilities that all individuals possess to varying degrees, influenced by the individual's culture and environment.

MI offers different ways of learning and could be the best alternative for teaching methods for SWLD in classrooms. Results from several programs and training activities based on Gardner and Moran's[31] theory of MI have proven the effectiveness of this strategy in improving reading skills for SWLD in elementary grades[32]. The usefulness of a training program based on the MI theory in fostering critical thinking in elementary school kids with developmental learning issues was also noted by Bakić-Mirić's[33] Ibrahim's[32] research which verified the effect of an MI-based training program on the development of academic achievement and critical thinking abilities in elementary school SWLD.

2.2. Previous Studies

Al-Khatib et al.'s[34] study aimed to determine the correlation between academic achievement and MI levels in Jordanian secondary school students. The findings demonstrated that the following areas of MI, which ranged from average to low in students, were measured: linguistic intelligence, spatial intelligence, naturalistic intelligence, musical intelligence, logical intelligence, mathematical intelligence, interpersonal intelligence, and kinesthetic bodily intelligence. While no statistically significant differences were observed in logical-mathematical, musical, or naturalistic intelligences, the study did uncover gender differences in linguistic, spatial, interpersonal, kinesthetic physical, and intrapersonal intelligences. Additionally, significant academic track differences were found in logical-mathematical and kinesthetic bodily intelligences. The results also indicated a strong positive correlation between linguistic and logical-mathematical intelligence and academic achievement, a weak positive correlation between spatial intelligence and academic achievement, a negative correlation between kinesthetic bodily intelligence and academic achievement, and no statistically significant correlation between musical, interpersonal, intrapersonal, and naturalistic intelligences and academic achievement.

Bakić-Mirić's study found that MI theory has a favourable influence on English language acquisition[33]. The study found that students who received MI-based teaching not only improved their language abilities, but also developed a more positive attitude towards learning.

Gebremeskel et al. examined the impact of teaching English based on MI theory[35]. The study identified models for designing English teaching and an assessment system for

teaching effectiveness based on MI theory. Subsequently, the basic experiment was conducted in teaching an experimental group using a multiple intelligences-based strategy, with pre- and post-assessments in student motivation and achievement. The results indicated that the multiple intelligences-based teaching strategy could practically enhance student interest and motivation in learning English and improve the quality of English teaching. It also showed significant improvement in students' achievement levels in linguistic skills related to the English language, using comprehensive assessment tools.

Hernandez[36] investigated the impact of MI theory and cooperative learning strategies on improving English language reading skills as a second language. The findings demonstrated a positive role for this theory in stimulating students' interest in reading. Activities involving MI in English reading played a significant role in enhancing students' performance in English reading. Additionally, the results showed that, in comparison to the control group, students in the experimental class showed greater engagement and confidence in their English reading classes. According to the study, teaching English reading to students using the MI theory may enhance their reading comprehension and performance. Likewise, Zhou et al.'s study indicates that the use of different intelligence reading activities can augment the efficacy of education by promoting attentiveness and elevating students' English language reading proficiency[37].

Saleh evaluated the efficacy of Differentiated Instruction (DI) in enhancing reading comprehension abilities at the EFL secondary level in Bahrain[38]. The results revealed that the experimental group outperformed the control group on the EFL reading comprehension exam. The data suggested that DI methods aided students' EFL reading comprehension skills. Furthermore, it demonstrated that employing a variety of resources to teach reading comprehension skills to students with varying needs and abilities improved their reading comprehension competency.

Ocampo's study aimed to determine the reading comprehension levels of the control and experimental groups in the pre-test and post-test, to determine whether there is a significant difference in the reading comprehension levels of the control and experimental groups in the pre-test and post-test results, and to identify the strengths and weaknesses of Differentiated Instruction[39]. The investigation was conducted using the quasi-experimental approach. Differentiated Instruction's strengths and limitations were identified through classroom observations, a survey, and the researcher's reflective notes. Despite the observed and faced hurdles, the statistical analysis indicated a substantial difference in pre-test and post-test outcomes.

Aliakbari et al. studied the effectiveness of individualised education and traditional-based instruction in improving Iranian students' reading comprehension[40]. Flexible grouping, tiered training, and tiered assignment approaches were employed to differentiate the content, procedure, and product in the treatment groups. The final performance test results showed that differentiated instruction improved pupils' reading comprehension in elementary and intermediate classes, but there was no significant change in advanced level classroom performance.

Ma'youf and Aburezeq evaluated the impact of tailored instruction in building reading comprehension abilities among students in the UAE[41]. The findings demonstrated significant variances in post-test scores at literal, logical, critical, and creative levels and overall reading abilities between the two research groups in favour of the experimental group. This suggests that the Differentiated Teaching technique had a beneficial effect on students' reading comprehension abilities. In light of the findings, many proposals were drafted and presented. In the same vein, Cummings discovered that there is no difference in student accomplishment when levelled teaching or traditional implementation is used. Furthermore, the study found no difference in success between male and female pupils when distinction was used[42].

Alavinia and Farhady conducted a quasi-experimental study to determine the effectiveness of tailored teaching on the vocabulary success of Iranian learners[43]. Learners in the experimental group got teaching tailored to their dominant intellect and learning styles, whereas those in the control group received no distinction. The post-test findings showed that pupils in the experimental group did better than those in the control group. Alavinia and Farhady also observed that spatial learners had the greatest mean score and intrapersonal learners had the lowest mean score on the posttest.

Hickerson explored the link between distinguishing reading homework and students' motivation, curiosity, and attitude towards homework[44]. The study revealed no difference in the two groups' attitude towards homework.

Savaş' study revealed that including activities targeted to different intelligences, such as music for musical learners or role-playing for bodily-kinesthetic learners, enhanced student engagement and motivation [45]. Andarab and Rouhi emphasised the usefulness of visual aids in improving comprehension of idiomatic phrases in English, emphasising the significance of catering to spatial intelligence in language instruction [46].

Similarly, Mokhtar et al. argued that project-based learning (PBL) might successfully harness multiple intelligences by giving students the opportunity to engage in projects that align with their cognitive strengths [47].

Pitychoutis and Al Rawahi studied the use of Gardner's Multiple Intelligences theory and Artificial Intelligence tools in English as a Foreign Language training [48]. The study synthesises current literature and case studies to provide techniques for engaging multiple intelligences with AI technology. Key applications include tailored feedback for linguistic and logical-mathematical learners, immersive simulations for spatial intelligence, and collaborative platforms to enhance interpersonal intelligence. Practical ways for incorporating AI technologies into MI-based training are presented, along with concerns for adapting educational experiences to different learner profiles. The study presents an educational framework that highlights the synergy between MI theory and AI technology, demonstrating how this approach may improve engagement, motivation, and inclusion in EFL courses.

Overall, several studies [35–39] emphasised the value of utilising MI theory to enhance the caliber of English language instruction, with a particular focus on creating multiple intelligence instructional strategies to raise student achievement and learning efficacy. Also, they showed how MI theory and cooperative learning techniques can help students become more proficient English readers as a second language, deepening our understanding of the theory's real-world implications in a variety of educational settings. Overall, these studies provide a theoretical and practical framework for using MI theory to improve English language skills and teaching, contributing to enriching educational practices and motivating students to actively participate in the learning process.

3. Method

3.1. Study Sample

The study sample consisted of 62 SWLD in reading English. They were selected randomly from the schools of the Directorate of Education and Teaching of Maan, Jordan during the first semester of 2024–2025. The study groups were randomly assigned, with 31 students in the experimental group, which studied using the MI strategy, and 31 students in the control group, which followed the traditional method.

3.2. Study Design

The study adopted a quasi-experimental design, involving two groups: an experimental group and a control group, with pre-tests and post-tests for reading comprehension, as **Table 1** presents:

Table 1. Experimental Design and Test Scores Distribution for Reading Comprehension.

Post-Test Reading Comprehension	Pre-Test Reading Comprehension	Independent Variable	Group	Distribution
Q2	Q1	X1	EG1	R
Q4	Q3	X2	CG	

Symbol Key:

- R: Random distribution
- EG1: Experimental group
- CG: Control group
- Q1, Q3: Pre-test for reading comprehension
- Q2, Q4: Post-test for reading comprehension
- X1: Experimental treatment (MI strategy)
- X2: Control group

3.3. Equivalence of Study Groups

The equivalence between the study groups was verified before the application using the MANOVA test as shown in **Table 2**.

Table 2. The performance of the groups on the pre-test for reading comprehension skills.

Strategy	Domain	Group	No.	Mean	Stnd. Devi.
Multiple Intelligences	Literal Comprehension	Experimental	31	15.53	1.246
		Control	31	14.27	3.262
	Inferential Comprehension	Experimental	31	12.47	1.302
		Control	31	11.47	1.598
	Critical Comprehension	Experimental	31	6.47	0.640
		Control	31	6.60	2.640
	Creative Comprehension	Experimental	31	5.20	0.775
		Control	31	4.87	0.915
	Total Score	Experimental	31	39.67	2.637
		Control	31	37.20	5.943

Table 2 shows substantial differences between the means of the performance of the experimental and control groups on the pre-test for reading comprehension in all domains and the total score. To determine whether the differences were statistically significant, the MANOVA test was applied as presented in **Table 3**.

Table 3. The Multivariate Analysis of Variance (MANOVA).

Source of Variation	Domain	Sum of Squares	FD	Mean Squares	F Value	Sign.
Group	Literal Comprehension	12.033	1	12.033	1.974	0.171
	Inferential Comprehension	7.500	1	7.500	3.531	0.071
	Critical Comprehension	0.133	1	0.133	0.036	0.851
	Creative Comprehension	0.833	1	0.833	1.159	0.291
	Total Score	45.633	1	45.633	2.159	0.153
Error	Literal Comprehension	170.667	28	6.095		
	Inferential Comprehension	59.467	28	2.124		
	Critical Comprehension	103.333	28	3.690		
	Creative Comprehension	20.133	28	0.719		
	Total Score	591.733	28	21.133		
Total	Literal Comprehension	6843.000	30			
	Inferential Comprehension	4363.000	30			
	Critical Comprehension	1384.000	30			
	Creative Comprehension	781.000	30			
	Total Score	44951.000	30			
Corrected Total	Literal Comprehension	182.700	29			
	Inferential Comprehension	66.967	29			
	Critical Comprehension	103.467	29			
	Creative Comprehension	20.967	29			
	Total Score	637.367	29			

* Statistically significant at the significance level ($\alpha \leq 0.05$).
** FD = Degrees of Freedom.

The results of **Table 2** showed that there are no statistically significant differences between the control and experimental groups on the pre-test for reading comprehension across the domains and the total score, based on the calculated F values shown in the table. These values are not statistically significant at ($\alpha \leq 0.05$), indicating the equivalence of the groups on the pre-test for the domains of reading comprehension.

3.4. Study Tools

A questionnaire was prepared to measure the impact of the MI strategy on improving reading comprehension skills among SWLD. The study consisted of 24 items measuring four reading comprehension skills: literal comprehension, inferential comprehension, critical comprehension, and creative comprehension. The tool had appropriate psychometric

properties (face validity, internal consistency validity/construction validity, and internal consistency reliability using Cronbach's alpha). The test included a cover page with a title, purpose, and instructions, followed by two short stories from the content taught to students titled "Unity is Strength" and "The Cunning Fox." Each story was followed by 12 multiple-choice items related to the reading comprehension skills, with two items for each skill, totalling 24 items for the entire test. The questions were arranged in order of increasing difficulty. Students read the text silently before answering the related questions, selecting one of four options for each question and answering in the designated space. The teacher then assessed the student's acquisition using a four-point Likert scale (Very High, High, Moderate, Low).

3.5. Educational Material and Activities

The educational material was developed by applying a teaching unit using the MI strategy for SWLD to assess their reading comprehension before and after the program. The material included a general text from an English language book suitable for fourth, fifth, and sixth-grade students. An instructional guide was prepared for the teachers who taught the experimental groups using the MI strategy to implement the selected teaching topic.

3.6. Procedures

- Prepare the reading comprehension test and administer it to both the experimental and control groups as a pre-test.
- Apply the MI scale to the experimental group to determine the different intelligence profiles of each student with learning difficulties, considering these profiles when distributing reading activities and applying teaching strategies.
- Design lessons related to the MI strategy by creating an instructional unit tailored to the types of intelligences present among the students.
- Implement the prepared strategies and activities based on the MI strategy for the experimental group students and provide them with guidance and information.
- Distribute the post-test for reading comprehension to the students in both the experimental and control groups.
- Enter the study results into the Statistical Package for the Social Sciences (SPSS) software, analyse them, and derive the findings and recommendations.

4. Results

To answer the first question, "Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the mean scores of the experimental and control groups in developing reading comprehension skills attributed to the MI teaching strategy?", analysis of covariance (MANCOVA) was used, considering the pre-test as the control variable. **Table 4** shows the means and standard deviations on the post-test for reading comprehension for the study groups.

Table 4. Means and Standard Deviations on the Post-Test for Reading Comprehension for the Study Groups.

Domain	Group	N	Mean	Stnd. Devi.	Adjusted Mean	Standard Error
Literal Comprehension	Experimental	31	32.33	2.127	32.323	0.435
	Control	31	20.20	2.862	20.211	0.435
Inferential Comprehension	Experimental	31	28.47	1.598	28.417	0.443
	Control	31	16.87	1.727	16.916	0.443
Critical Comprehension	Experimental	31	14.73	1.033	14.785	0.279
	Control	31	8.80	1.082	8.748	0.279
Creative Comprehension	Experimental	31	10.47	1.187	10.441	0.270
	Control	31	6.73	1.799	6.759	0.270
Total Score	Experimental	31	86.00	4.408	85.966	1.047
	Control	31	52.80	3.529	52.634	1.047

Table 4 shows apparent differences between the mean scores of the experimental group, which was taught using the MI strategy, and the control group, which was taught using the traditional method, on the post-test for reading comprehension across the domains and the total score. To determine whether these differences are statistically signif-

icant, the MANCOVA test was applied. **Table 5** presents the MANCOVA to verify the significance of the differences between the mean scores of the study groups: those taught using the MI strategy and the traditional method on the post-test for reading comprehension across domains and the total score.

Table 5. Multivariate Analysis of Covariance (MANCOVA).

Source of Variation	Domain	Sum of Squares	FD	Mean Squares	F Value	Sign.
Pre-test		Hotelling's Trace = 0.107, Sig = 0.636				
	Literal Comprehension	0.043	1	0.043	0.016	0.901
	Inferential Comprehension	0.952	1	0.952	0.336	0.567
	Critical Comprehension	1.034	1	1.034	0.921	0.346
	Creative Comprehension	0.249	1	0.249	0.236	0.631
	Total Score	0.444	1	0.444	0.028	0.868
Group		Hotelling's Trace = 19.363, Sig = 0.000				
	Literal Comprehension	1021.515	1	1021.515	374.283*	0.000
	Inferential Comprehension	921.031	1	921.031	325.007*	0.000
	Critical Comprehension	253.723	1	253.723	226.093*	0.000
	Creative Comprehension	94.437	1	94.437	89.725*	0.000
	Total Score	7736.293	1	7736.293	489.001*	0.000
Error						
	Literal Comprehension	73.690	27	2.729		
	Inferential Comprehension	76.515	27	2.834		
	Critical Comprehension	30.300	27	1.122		
	Creative Comprehension	28.418	27	1.053		
	Total Score	427.156	27	15.821		
Total						
	Literal Comprehension	21876.000	30			
	Inferential Comprehension	16500.000	30			
	Critical Comprehension	4449.000	30			
	Creative Comprehension	2352.000	30			
	Total Score	152869.000	30			
Corrected Total						
	Literal Comprehension	1177.867	29			
	Inferential Comprehension	1086.667	29			
	Critical Comprehension	295.367	29			
	Creative Comprehension	133.200	29			
	Total Score	8794.300	29			

* Statistically significant at the significance level ($\alpha \leq 0.05$).
** FD = Degrees of Freedom.

The results in **Table 5** indicate statistically significant differences between the experimental group and the control group on the post-test for reading comprehension across the domains and the total score, based on the calculated F value shown in the table, which is statistically significant at ($\alpha \leq 0.05$). To verify the direction of the differences using Pairwise Comparisons for adjusted multiple comparisons, **Table 6** displays the results of pairwise comparisons to determine the direction of variances in improving reading comprehension skills.

The results in **Table 6** show that the differences in reading comprehension across the domains and the total score were in favor of the experimental group taught using the MI strategy. To answer the second question: "What is the effectiveness of the MI strategy in improving reading comprehension among SWLD?" Haridy's Timed Gain Ratio (H-TGr) was used as shown in **Table 7**.

The results in **Table 6** indicate that the effectiveness of the MI strategy in improving reading comprehension was acceptable according to the correction index of the equation.

Table 6. Pairwise comparisons: the direction of differences in developing reading comprehension skills.

Domain	Group	Adjusted Mean	Experimental	Control
Literal Comprehension	Experimental	32.323	-	12.112*
	Control	20.211	−12.112*	-
Inferential Comprehension	Experimental	28.417	-	11.501*
	Control	16.916	−11.501*	-
Critical Comprehension	Experimental	14.785	-	6.036*
	Control	8.748	−6.036*	-
Creative Comprehension	Experimental	10.441	-	3.683*
	Control	6.759	−3.683*	-
Total Score	Experimental	85.966	-	33.332*
	Control	52.634	−33.332*	-

Table 7. Haridy's Untimed Gain Ratio) (H-TGr): the degree of effectiveness of teaching strategies (MI) in improving reading comprehension.

Strategy	Test	Mean Score	Highest Measurement	Gain Ratio (H-TGr)	Effectiveness Level
Multiple Intelligences	Pre-test	43.13	96	0.483	Acceptable
	Post-test	86.00			
	Pre-test	39.67			
	Pre-test	46.67			

5. Discussion

To improve reading skills among SWLD, various modern teaching strategies and activities designed according to the types of MI present in the experimental group of SWLD were used. The results showed that the group taught using the MI strategy and patterns demonstrated improved performance and reading comprehension skills compared to the control group taught using the traditional method. As a result, the outcomes supported the value of MI-designed exercises for enhancing SWLD students' reading comprehension abilities. According to Abu Al-Hasan et al.[49], Ibrahim[32] and Al-Zoubi et al.[50], training programs and activities based on Gardner and Moran's[31] theory of MI are effective in improving reading skills for students with special needs (SWD) in primary grades. These activities include enhancing linguistic and verbal skills and reflecting on the performance of the experimental group of students with special needs.

Language, logical, spatial, physical, personal, social, natural, and musical intelligences are just a few of the many abilities and skills that enable the person to learn new information, which are included in the activities and tactics created for SWLD based on their intelligence patterns. Each person possesses these intelligences to varying degrees, which are shaped by their surroundings and culture[39]. The experimental group's comprehension of the read text improved as a result of these activities, which is particularly noteworthy given the need to switch from traditional teaching methods to more contemporary ones that take into account the unique needs of each student and take intelligences into account.

Gardner and Moran's[31] theory of MI emphasised the plurality of learning styles and questioned the effectiveness and efficiency of traditional learning methods. This theory places greater importance on the learner and allows them to employ their intelligences regardless of their capabilities, making them more involved in the educational process. Reading difficulties and problems are the most impactful on children with learning difficulties, as reading is an important skill a child learns in school. While children acquire spoken language through listening and spontaneously, they still need to understand written language and express themselves through structured learning in school. To succeed in any subject, a student must be capable of reading with all its skills, one of the most crucial being reading comprehension. This skill represents the culmination and key to the entire learning process[46].

The MI strategy contributed to increasing students' ability to interact and learn with the educational situation and to retrieve information easily, as it considers the preferred types and patterns of intelligences among students. This would also help them reduce confusion and frustration that they

often feel from experiencing failure with traditional learning methods. Additionally, when the teacher considers the different types of intelligences among students and includes activities that align with the MI strategy for SWLD, such as linguistic intelligence activities like giving children creative texts to discuss, logical intelligence activities like organising information from texts or stories into detailed diagrams, spatial intelligence activities like using verbal imagery of the text, kinesthetic intelligence activities like using games or role-playing stories, and musical intelligence activities like using songs related to the topic, it bridges the gap between the teacher and the student. These activities provide multiple sources to achieve the learning process and positively reflect on the motivation to learn and the student's attempt to understand, interpret, and comprehend texts at all levels of reading comprehension: literal, inferential, critical, and creative, making other subjects easier[40–43].

Furthermore, this enables SWLD to understand topics and easily apply them in other subjects and situations, achieving success, progress, and higher academic achievement. Teachers are also required to facilitate access to the general education curriculum for SWLD, not only by placing them in general education classrooms but also by removing sensory, emotional, and academic learning barriers and modifying lessons. Therefore, teachers should pay attention to how to organise the actual workspace in the classroom and make the necessary adjustments to exploit students' abilities and intelligences to ensure their success. For example, rearranging the classroom so that a group of students who prefer kinesthetic intelligence work on a project in the open area on the floor, while another group with strong linguistic skills works on the interactive board, and three or four students with logical or mathematical intelligence work individually on computer-based curricula. Meanwhile, the teacher works with five students at the teacher's work table under social intelligence. Thus, teachers should provide diverse teaching methods to ensure easy access to a varied and modern global educational curriculum that includes modifying traditional lessons, learning centers, project-based learning, and flipped or dynamic classrooms[40–44].

The MI strategy influences the activities and reading operations that students practice during classroom instruction. It gives the student a major role in self-assessment, enabling them to plan, organise, and apply scientific knowledge in different learning situations. It provides an exciting and stimulating educational environment, increasing the interest and motivation of SWLD to learn reading and its various skills, making them more active and positive during learning and understanding the information they read.

6. Conclusions, Implications, and Recommendations

The results showed that the MI learning strategy is one of the best educational strategies used in teaching SWLD, who often do not succeed with traditional teaching methods and always need diverse teaching methods that consider their multiple intelligence patterns. This strategy is the best alternative for teaching SWLD in general education classes, as it creates an educational environment that diversifies teaching strategies according to the type of intelligence available to students, such as linguistic, logical, or kinesthetic intelligence, and contributes to providing a range of activities, training, and shared tasks that match the intelligence patterns and abilities of students. The MI strategy is one of the modern teaching strategies aimed at developing cognitive and scientific thinking and linguistic and verbal skills among primary school students. It is a cognitive model that describes how students use their intelligences, abilities, and preferred learning styles to solve problems. Students realised their ability to think and understand in multiple ways and styles for specific content, which helps them improve and develop their linguistic and verbal skills, raises the level of achievement and attitudes towards academic subjects, enabling them to read and understand them, thus increasing their interaction, participation, and satisfaction, striving for better academic progress.

Based on the study results that showed the effectiveness of activities and methods designed using the MI strategy in improving the level of reading comprehension among SWLD, the study recommends encouraging resource room and special education teachers to train and use the MI strategy within general education classrooms to improve their reading and comprehension skills.

6.1. Implications

The study calls for moving beyond the traditional view of intelligence (limited to linguistic and logical abilities) and

adopting a broader perspective that recognizes the existence of multiple, independent intelligences that can be developed. Applying Multiple Intelligences (MI) theory in teaching enables educators to utilize the strengths of students with learning difficulties instead of focusing solely on their weaknesses. Implementing this theory requires classroom environments with diverse educational activities that address all types of intelligences and accommodate individual differences. Experimental studies indicate that using MI-based strategies enhances students' motivation and academic achievement, especially in reading, writing, and science. The theory requires teachers to be creative and flexible in lesson planning and in using a variety of tools suited to students' different intelligences.

6.2. Recommendations

The study recommends redesigning educational programs for students with learning difficulties based on MI theory, focusing on utilizing their strengths rather than just addressing their weaknesses. Teachers are encouraged to diversify learning activities within a single lesson to match the various intelligences of their students, allowing each learner to benefit from what suits them best. The effectiveness of the theory is not limited to learning difficulties alone; it can be applied to other disabilities as well, which calls for generalizing its strategies. A comprehensive, multidimensional assessment is recommended to evaluate all aspects of a person's intelligences—not just linguistic or logical abilities. Teaching methods should also include activities that target the development of special talents and strengths that may be high in some students with learning difficulties.

Author Contributions

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

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