

A Proposed Program to Improve Spelling Among Students with Learning Disabilities in Saudi Arabia

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The study aimed at presenting a proposed program to improve the spelling of students with learning disabilities in the elementary stage. The study sample consisted of (8) students with LDs in the fifth grade of primary school. The study used the semi-experimental approach, and for the purposes of the study, a test was applied to the sample. The results showed that the errors represented by (addition) are the most common spelling errors among the students of the study sample, then deletion, then replacement. There were no statistically significant differences at the level of (0.05) between the mean scores of the students of the control and experimental groups in the pre-measurement of the spelling difficulties. There were statistically significant differences at the level of (0.05) between the mean scores ranks of the experimental group students in the pre and post measurements of the spelling difficulties observation card for students with learning difficulties (total) and the dimensions (add - delete - replace), and the differences came in favor of the post application. There was a statistically significant difference between the mean scores of the experimental group in the pre and post application of the performance test of spelling skills, and this indicates the effectiveness of the proposed program to improve spelling among students with learning difficulties.

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INTRODUCTION

Reading is a complex acquired process although it occurs naturally to most children. However, it remains one of the main modern educational problems, and it is among the most common learning disabilities. In Saudi Arabia, it constitutes 80% of the total learning disabilities that students face. Its prevalence among primary school children is 20%, and its prevalence among males is three times more than females (Bokaz, 2020). Students with learning disabilities face difficulties in reading, which results in other problems in the rest of the subjects that are originally based on reading. Studies indicated that one out of every three students leave school because of their poor academic achievement. Because reading is a complex skill that is based on mastery, there are two processes, coding, i.e. character recognition (sound), and comprehension, which requires cognitive methods and interaction with the reader's subjective experiences, drawing conclusions through the text, and finding relationships. In the case of students with reading disabilities, their initial problem is related to coding, then comes the problem of comprehension, which is always consequential, as it starts with the coding problem first (Ababneh, 2010).

Dyslexia represents a serious problem at the global level, not only with regard to the individual, but its effects extend to the society in which these children live. The number of children suffering from dyslexia has increased to the point that it called for the attention of experts and researchers to solve this problem. Dyslexia is a disorder that has serious implications for the academic, social, and emotional functioning of a large number of children (Al-Subhi, 2001).

Dyslexia is an educational disorder that is mainly evident in reading and spelling. Given the importance of this target group, and the importance of improving their academic level, academic achievement, and entry into various aspects of life, and to overcome some reading difficulties and spelling problems, this study came to present a proposed program to improve spelling among students with learning disabilities (Bokaz, 2020). Learning disabilities are among the categories of special education that have received great attention from researchers and specialists in the field of special education as a result of their increasing prevalence, especially in the primary stage. Most researchers agree that learning disabilities are the result of a disorder in the brain or dysfunction that results in a deficiency in the basic psychological processes involved in understanding and using oral and written language, which may appear in inappropriate forms represented in the disturbance of thinking, listening, speaking, reading, writing, spelling, and arithmetic. They also show a divergence between the expected achievement and the actual achievement, even though they have normal intelligence and do not suffer from any hearing, visual, or motor disabilities or a low social and economic level (Khoja, 2019).

The difficulties of learning to read and write are among the problems that affect different areas of life and accompany a person for life. It is not a local problem linked to a particular society or culture, but rather, it is a problem of a global nature, and it is more prevalent. The proportion of these children is estimated at 10% of all children of school age. Rief and Stern (2010) define learning disabilities as a neurological disorder that affects the mind's ability to receive, process, store and deal with information, and this term is used to describe the unexpected

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difficulties experienced by an individual with at least a normal level of intelligence, in acquiring basic academic skills that are necessary to succeed in school, work and adjust to life in general.

Spelling

It is the process of encoding the spoken language into the letters of the written language system. As for reading, it is the process of interpreting the written language into a spoken language. All of the audio-visual perception and sensory-motor and kinesthetic integration are necessary elements for the correct spelling process (Learner, 2012). Students with learning disabilities view spelling as the most frustrating part of writing, although the spelling mistakes they make are not fundamentally different from the mistakes of other children. Their development in spelling follows the same patterns that are observed in the development of those with normal achievement, with the exception of the fact that this development suffers from something more or less delayed. Therefore, there is no longer a place now for the previously prevailed belief that people with learning disabilities commit errors that differ quantitatively and qualitatively from the mistakes committed by those with normal achievement (Al-Waqfi, 2012). Spelling is the child's ability to formulate or compose words through their different letters and sounds. There are differences in the spelling of the various words and in the way those letters and words are pronounced. Each letter of the Arabic language has four sounds of the consonant and the vowel. Therefore, the child needs a high ability to know these sounds and their locations in the world, then formulate the word according to the sounds of the letters composed of them, as well as the sounds of syllables. The word may consist of phrases and sounds (the letter that is pronounced independently) (Bataineh et al., 2009).

Forms of spelling errors

The process of analyzing the errors of students who suffer from learning disabilities in the field of spelling indicates that there are many types of these errors (Robertson, 2002). These errors include deleting some letters in the word, writing the words as the student used to pronounce them as a child, writing the word in light of the child's tone, and reversing writing some words. Other errors include phonetic generalization, not distinguishing between letters in a word, and changing the last consonants in the word. Hogan, et al (2005) investigated the effectiveness of phonological awareness assessment in predicting reading skills. The researcher and his team examined the skill of phonemic awareness and letter recognition in the kindergarten stage, and then examined the skill of phonemic awareness, decoding the letter, and reading words with both with or without meaning. This test was applied in the second and then fourth grades, and the study sample consisted of (570) children. Some results revealed the ability of phonemic awareness to predict reading in the second grade, but the ability to predict reading skills in the fourth grade was not clear.

Hafez (2008) identified the effectiveness of a program based on the five-structural learning model for developing the necessary alphabetical writing skills for students. The study used the experimental method and applied the study to a sample of students from the sixth primary school in East Riyadh schools, who were divided into two groups, an experimental group (36) from Al-Hudaybiyah Elementary and a control group (36) from Imam Al-Qaradhy Elementary School. The results showed that after implementing the program, students had chances to apply what they have learned in writing and spelling. The program proved to have a high degree of validity and stability, and therefore suitable for use with a high degree of confidence.

Bin Aroum (2010) identified the types of reading difficulties that primary school students suffer from. The researcher chose a sample of students of the second grades (31 students) and the third (33 students) from schools located in the city of Mostaganem in western Algeria. After ensuring the safety of their mental abilities by means of the cognitive functions test prepared by Gil and Toullat et al. The results showed statistically significant differences between students of the second and third years of primary school in the difficulties of learning to read, and in favor of second-year students. Ababneh (2010) identified the difference in phonemic awareness skills involved in spelling between dyslexic students and their peers at the primary stage in Jordan. The study sample consisted of (260) male and female students, including (200) ordinary male and female students and (60) male and female students with dyslexia. The spelling test and an achievement test in reading skills were also applied to them. The study found that there are statistically significant differences in phonemic awareness skills and between ordinary students and those with dyslexia in favor of ordinary students, as well as differences in the skill of quick naming of letters for the benefit of class students. There was a positive, statistically significant relationship between phonological awareness skills and dyslexia in the sample as a whole, that is, the more phonological awareness skills increase, dyslexia decrease.

Abu Daqqa (2012) revealed the prevalence of reading difficulties among students of the second, third, and fourth grades of the basic stage in the schools of Ramallah and Al-Bireh Governorate. The study was applied to a sample

of (1385) students. The study used an Arabic test to measure basic reading skills, a non-verbal test to measure mental ability, and a list of behavioral characteristics for people with learning disabilities. The study found that the most common reading difficulties among the study sample were in the following aspects: reading comprehension, comprehension, answering in a full sentence, distinguishing between vowels, reading words that sound similar, reading a sentence consisting of two words correctly, and pronouncing words consisting of two letters or more with the movements. Al-Shorbagy et al, (2017) identified the impact of a program based on phonemic and phonological awareness of performance (Reading in Arabic for first graders). The researchers designed a reading test on phonemic and phonological awareness. The study sample included (215) male and female students from four schools, divided into two groups: experimental and control. The results showed that there were statistically significant differences in the average test results between the experimental and control groups, in favor of the experimental group. The results also showed that there were statistically significant differences in the average results of the experimental group students in the third test, which seeks to follow up the impact of the experience on the students. On the other hand, the results showed that there were no statistically significant differences in the average test results between males and females. Al-Farsi and Imam (2017) revealed the effectiveness of a training program based on the entrance to phonemic awareness in improving the decoding skill of third-grade students with reading difficulties. The sample included (41) students enrolled in the third-grade learning difficulties program. Tools for diagnosing reading difficulties were applied according to the approach of conflict between achievement and intelligence, then a therapeutic sample of (14) male and female students who were diagnosed with reading difficulties were selected, and they were randomly divided into two equal groups: experimental and control. The results of the study indicated that there were statistically significant differences between the experimental group and the control group in all dimensions of the phonemic awareness test, and the decoding skill test except after reading the text words, in favor of the experimental group. There were statistically significant differences between the pre- and post-measurements in favor of the post-measurement. Al-Qawqneh (2020) investigated the effectiveness of a training program for developing expressive language skills, receptivity, and social interaction among a sample of students with learning difficulties in schools in Ajloun Governorate. The researcher prepared the training program and the study tools. (20) students were intentionally selected from among the students with learning difficulties in the sixth grade who are studying at Ajloun Basic School for Boys, and they were randomly distributed into an experimental and a control group. The study showed that there were statistically significant differences in all dimensions of the expressive and receptive language skills and social interaction skills in the post-measurement in the performance of students with learning difficulties due to the training program used in the study. Most studies have confirmed that students with learning disabilities face difficulties in learning to read. Teaching reading aims at all stages and levels to develop the individual's ability to understand what is contained in the printed material, as true reading is the reading associated with comprehension. The special education standard is one of the most important standards that help in judging students with learning difficulties (Al-Mukhaleh and Al-Rammneh, 2019). Students with learning disabilities face many difficulties in spelling and expression in the language, which is one of the basic requirements for the learning process. Ababneh (2010) indicated that the ability to spell is a complex skill with different aspects. Therefore, students with learning disabilities have difficulty in the process of spelling, so spelling is a more accurate indicator of language disorders than reading problems. Therefore, the current study aims at improving the spelling of a sample of students with learning disabilities through a proposed program to measure spelling difficulties and to detect common errors during spelling.

To achieve the objectives of the current investigation, the study attempted to answer the following question:

“What is the impact of the proposed program to improve spelling among students with learning disabilities?”

From this main question, the following sub-questions has emerged:

1. What are the common mistakes of the study sample during spelling?
2. Are there any statistically significant differences between the mean scores of the experimental and control groups in the degree of spelling skill on the pre-test of the spelling difficulties for students with LDs?
3. Are there any statistically significant differences between the mean scores of the experimental group members in the two measurements (pre and post), (post and follow-up) due the spelling difficulties of students with LDs?
4. Are there any statistically significant differences between the mean scores of the experimental and control groups in the degree of spelling skill on the pre-measurement of the performance test for students with LDs?

5. Are there any statistically significant differences between the mean scores of the experimental group members in the two measurements (pre and post), (post and follow-up) for the performance test for students with LDs?

This study is significant as it sheds light on the spelling methods used by students with learning disabilities. The study also links between learning methods of spelling and learning difficulties in relation to academic achievement, in an attempt to gain a broader understanding of the role of spelling tests and learning difficulties in relation to academic achievement. The study might help in improving the spelling of students with learning disabilities, which effectively affects their school performance. The study helps those who work with students with learning disabilities to develop methods of employing their abilities and capabilities, to improve their educational abilities. The results of this study provide the stakeholders with some suggestions that are supposed to contribute to improving the conditions of students who have difficulties in spelling and reading skills.

RESEARCH METHODOLOGY

Population and Sample

The study population consisted of all (300) students of the fifth grade of primary school in the city of Khamis Mushait for the academic year 2020-2021. They were distributed among public education schools in the city of Khamis Mushait, according to the statistics of the Ministry of Education Education. The study sample consisted of 16 students distributed into an experimental group (8 students) and a control group (8 students) as shown in Table 1.

Table 1. Distribution of sample members by group and school name

| Group | Name of school | No. |
|--------------|---|-----|
| Experimental | Ubaidah bin Al-Jarrah Primary School | 8 |
| Control | Hizam bin Hakim primary school | 8 |
| Total | | 16 |

Instruments of the Study

First: The spelling test

The study used a test to measure spelling skills. After reviewing some of the spelling tests such as the (Al-Khasawneh, 2016), and some previous studies, the researcher prepared a spelling test after identifying the main spelling difficulties and analyzing them into a set of difficulties and sub-problems arranged according to their performance sequence. The spelling test items were formulated in the form of short behavioral phrases describing a single behavior in the present tense so that it can be directly observed. It was taken into account when formulating the spelling test phrases that they agree with their objectives and nature on the one hand, and the performance to be evaluated on the other hand.

The study relied on the method of internal consistency to test the spelling test, where the Pearson correlation coefficients were calculated between the score of each phrase and the total sum of the scale. The results showed that there is a direct correlation between the phrases to test the spelling scale and its total sum, and it is clear that all the phrases showed correlation coefficients of statistical significance at (0.05) and (0.01), where the scores ranged between (0.466-0.895). The spelling test had a high degree of internal consistency, which confirms its validity.

To ensure the validity of the test, apparent validity was also used. The test was presented to a group of judges specialized in the Arabic language, special education, mental health, and psychology in the faculties of education. Personal interviews were conducted with the members of the jury, each individually, to discuss any inquiry related to the test. As a result, some judges recommended the necessity of some modifications to be made in the formulation of some questions without deleting or adding other questions, which increased their point of view in the objectivity, accuracy, and scientific integrity of the test. The modifications were made, according to their notes, and thus the test became prepared and valid for application to the exploratory sample.

The researcher relied on Cronbach's Alpha method in calculating the reliability of the spelling. The value of the Cronbach's alpha coefficient of the spelling test was (0.853), which is a high value.

Second: The Training Program

The proposed program was prepared in the light of theoretical frameworks and previous studies in this regard, especially those dealing with the preparation of a program to develop academic skills for children in general, and children with learning disabilities in particular. The study aims at improving the spelling of students with learning disabilities, by achieving the following goals:

- To read correctly and with correct pronunciation free of errors.
- To master the reading of letters and words without alteration or repetition.
- To distinguish between linguistic phenomena.
- To master reading letters and words without deleting or adding.
- To distinguish between letters in form and sound.
- To analyze words into letters and syllables.
- To arrange letters and words to form useful words and sentences.

The program included (15) sessions to improve spelling in a period of one month and one week, with (3) sessions per week. The duration of each session ranges between 35-40 for students with learning difficulties through the use of activities to improve students' spelling, including (1) a session that takes place collectively as all parents and teachers attend to explain the techniques and activities used in the program so that they can follow up their children in achieving the desired goals.

RESULTS and DISCUSSION

Results of the first question:

Students' errors were classified into three types: omission, substitution, and addition, in accordance with the spelling test (the reading part). The following table presents these errors and their percentages.

Table 2. The number of students' spelling errors and their percentages (n = 16)

| Type of error | | | | | | | |
|---------------|----------------|------------|----------------|--------------|----------------|-----------|----------------|
| Addition | | Omission | | substitution | | To tal | Percent age |
| Err ors | percent age | Err ors | percent age | Err ors | percent age | | |
| 51 | 63.75% | 36 | 56.25% | 152 | 55.88% | 239 | 57.45% |

It is clear from Table (2) that addition is the most common spelling error among students in the study sample, then deletion, and then substitution. The percentages were (63.75%), (56.25%), and (55.88%), respectively, which are high percentages, which confirms the existence of spelling difficulties in the study sample.

Results of the second question:

The Mann-Whitney U test was used to extract differences between the scores of the experimental and control group. The results are presented in the following table.

Table 3. The Mann-Whitney test to compare the scores of the control group and the experimental group in the pre-measurement of the spelling test (the reading part)

| Dimension | Group | N | Mean score | Standard deviation | average rank | Sum of ranks | U value | Z value | Sig. |
|--------------|--------------|---|------------|--------------------|--------------|--------------|---------|---------|------|
| addition | control | 8 | 1.875 | 0.70 | 8.6 | 69.5 | 30.5 | - | 0.86 |
| | experimental | 8 | 1.75 | 0.99 | 9 | 66.5 | | | |
| omission | control | 8 | 2 | 0.53 | 9.7 | 78.0 | 22 | 1.195 | 0.23 |
| | experimental | 8 | 1.5 | 0.92 | 7.2 | 58.0 | | | |
| Substitution | control | 8 | 7.375 | 2.38 | 8.3 | 66.5 | 30.5 | - | 0.87 |
| | experimental | 8 | 7.625 | 2.44 | 1 | 69.5 | | | |
| Total | control | 8 | 11.25 | 2.38 | 8.8 | 70.5 | 29 | - | 0.78 |
| | experimental | 8 | 10.875 | 2.44 | 1 | 65.5 | | | |

It is clear from Table (3) that there are no statistically significant differences between the mean ranks of the students of the control and experimental groups in the pre-measurement of the spelling test (the reading part). The mean scores of the control group students on the dimensions and the spelling test were (1.875), (2), (7.375), (11.25), respectively. The mean scores of the experimental group students on the dimensions and the spelling test were (1.75), (1.5), (7.625), (10.875), respectively. It can be seen from Table (3) that the (Z) values of the dimensions and the spelling scale test were (-.169), (-1.195), (-.161), (-.267) respectively, all of which are not statistically significant.

Results of the third question:

These results were related to the second and third hypotheses of the study, which state: "There is no statistically significant difference at the level ($\alpha \geq 0.05$) between the mean scores of the experimental study group in the pre and post applications of the spelling test (the reading part) (total and dimensions) to detect spelling errors.", and "There is no statistically significant difference at the level ($\alpha \geq 0.05$) between the mean scores of the experimental study group in the post and follow-up applications of the spelling test (the reading part) (total and dimensions) to detect spelling errors."

The answer to this question came as in the following tables (4), (5), and (6):

Table 4. The Wilcoxon test to compare the average scores of the experimental group in the pre and post-measures of the spelling test

| Dimension | Average | N | average rank | Sum of ranks | U value | Sig. |
|--------------|----------------|----------------|--------------|--------------|---------|------|
| addition | Positive ranks | 8 ^a | 4.50 | 36 | -2.549 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| omission | Positive ranks | 8 ^a | 4.50 | 36 | -2.549 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Substitution | Positive ranks | 8 ^a | 4.50 | 36 | -2.527 | .012 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Total | Positive ranks | 8 ^a | 4.50 | 36 | -2.524 | .012 |
| | Negative ranks | 0 ^b | .00 | .00 | | |

a= the average scores for the pre-application are lower than the mean for the post-application

It is evident from Table (4) that there are statistically significant differences at the level (0.05) between the mean ranks of the experimental group in the pre and post-application of the spelling test (the reading part). The differences were in favor of the post-application. The (Z) values of the dimensions and the total of the spelling test were (-2.549), (-2.549), (-2.527), (-2.524), respectively, all of which are statistically significant values.

Table 5. The effect size of the proposed program to improve spelling among students with LDs in the spelling test (the reading part) (n = 8)

| Dimension | Eta | eta square ² (η) | Effect size |
|--------------|------|------------------------------------|-------------|
| Addition | .873 | .762 | Big |
| Omission | .840 | .705 | Big |
| Substitution | .863 | .744 | Big |
| Total | .896 | .802 | Big |

By extrapolating the results presented in the previous table, it became clear that the values of (η^2) associated with the effect size of the independent variable (the proposed program to improve spelling among students with learning difficulties) on reducing observed errors, and the spelling scale test (the reading part) as a whole was high. The value on errors ranged between (0.705-0.762) and for the spelling test (the reading part) as a whole (0.802). This means that (80.2%) of the variance occurring in the spelling test (the reading part) as a whole, is all due to the independent variable (the proposed program to improve spelling among students with learning difficulties).

Table 6. The Wilcoxon test to compare the mean scores of the experimental group in the post and follow-up of the spelling test (the reading part)

| Dimension | Average | N | average rank | Sum of ranks | U value | Sig. |
|--------------|----------------|----------------|--------------|--------------|---------|------|
| addition | Positive ranks | 2 ^a | 1.50 | 3.00 | -1.342 | .18 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| omission | Positive ranks | 1 ^d | 1.00 | 1.00 | -1 | .317 |
| | Negative ranks | 0 ^e | .00 | .00 | | |
| Substitution | Positive ranks | 3 ^g | 2.00 | 6.00 | -1.732 | .083 |
| | Negative ranks | 0 ^h | .00 | .00 | | |
| Total | Positive ranks | 4 ⁱ | 2.50 | 10.00 | -1.841 | .066 |
| | Negative ranks | 0 ^k | .00 | .00 | | |

a= the scores for the follow-up application are lower than the mean for the post-application

It is evident from Table (6) that there are no statistically significant differences between the mean ranks of the experimental group students in the post and follow-up applications of the spelling test (the reading part). The (Z) values of the dimensions and the sum of the spelling test were (-1.342), (-1), (-1.732), (-1.841), respectively, all of which are non-statistically significant values, which indicates the existence of the impact of the proposed program to improve spelling among students with LDs.

Results of the fourth question:

These results were related to the fourth hypothesis of the study, which states that "there is no statistically significant difference at the level ($\alpha \geq 0.05$) between the mean scores of the control and experimental groups in the pre-application of the spelling skills performance test. The answer to this question was as shown in the following table.

Table 7. The Mann-Whitney test to compare the mean scores of the control group and the experimental group in the pre-application of the spelling test.

| Skill | Group | N | Mean score | Standard deviation | average rank | Sum of ranks | U value | Z alue | Sig. |
|------------------------|--------------|---|------------|--------------------|--------------|--------------|---------|---------|-------|
| correct reading | control | 8 | 26.13 | 5.51 | 8.31 | 66.50 | 30.5 | - .159 | 0.874 |
| | experimental | 8 | 26.88 | 5.87 | 8.69 | 69.5 | | | |
| Discrimination | control | 8 | 4.50 | 1.60 | 6.75 | 54 | 18 | - 1.486 | 0.137 |
| | experimental | 8 | 6 | 2.27 | 10.25 | 82 | | | |
| Analysis | control | 8 | 1 | 0.93 | 7 | 56 | 20 | - 1.362 | 0.173 |
| | experimental | 8 | 1.75 | 1.16 | 10 | 80 | | | |
| Understanding meanings | control | 8 | 2.38 | 1.41 | 7.44 | 59.5 | 23.5 | - .947 | 0.344 |
| | experimental | 8 | 3 | 1.20 | 9.56 | 76.5 | | | |
| Arranging | control | 8 | 1.50 | 0.53 | 7 | 56 | 20 | - 1.389 | 0.165 |
| | experimental | 8 | 2 | 0.76 | 10 | 80 | | | |
| Total | control | 8 | 35.50 | 5.21 | 7.06 | 56.50 | 20.5 | - 1.221 | 0.222 |
| | experimental | 8 | 39.63 | 6.72 | 9.94 | 79.50 | | | |

It is clear from Table (7) that there are no statistically significant differences between the mean ranks of the students of the control and experimental groups in the pre-application of the spelling test (as a whole), the group and general skills (reading and correct pronunciation - discrimination - analysis - understanding meanings - arrangement).

The average responses of the control group students on the dimensions and the spelling test were (26.13), (4.50), (1), (2.38), (1.50), and (35.50), respectively. The average responses of the experimental group students on the dimensions and the test were (26.88), (6), (1.75), (3), (2), (39.63), respectively. The (Z) values for skills and the total test were (-.159), (-1.486), (-1.362), (-.947), (-1.389), (-1.221), respectively, all of which are not statistically significant values.

Results of the fifth question:

These results were related to the fifth and sixth hypotheses of the study, which state that "there is no statistically significant difference at the level ($\alpha \geq 0.05$) between the mean scores of the experimental study group in the pre and post applications of the spelling skills performance test" and "there is no statistically significant difference at the level of ($0.05 \geq \alpha$) among the mean scores of the experimental study group in the post and follow-up applications of the spelling skills performance test." The answer to this question is presented in tables (8), (9), (10).

Table 8. The Wilcoxon test of the comparison of the mean scores of the experimental group in the pre and post-application of the performance test

| Skill | Average | N | average rank | Sum of ranks | U value | Sig. |
|-----------------------------------|----------------|----------------|--------------|--------------|---------|------|
| correct reading and pronunciation | Positive ranks | 8 ^a | 4.50 | 36 | -2.521 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Discrimination | Positive ranks | 8 ^a | 4.50 | 36 | -2.536 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Analysis | Positive ranks | 8 ^a | 4.50 | 36 | -2.533 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Understanding meanings | Positive ranks | 8 ^a | 4.50 | 36 | -2.546 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Arranging | Positive ranks | 8 ^a | 4.50 | 36 | -2.539 | .011 |
| | Negative ranks | 0 ^b | .00 | .00 | | |
| Total | Positive ranks | 8 ^a | 4.50 | 36 | -2.524 | .012 |
| | Negative ranks | 0 ^b | .00 | .00 | | |

a= the average scores for the pre-application are lower than the mean for the post-application

It is evident from Table (8) that there are statistically significant differences between the mean ranks of the experimental group students in the pre- and post-application of the performance test and general skills. These differences came in favor of post-application. The (Z) values for skills and the total test were (-2.521), (-2.536), (-2.533), (-2.546), (-2.539), (-2.524), respectively, all of which are statistically significant values.

Table 9. The effect size of the impact of the proposed program to improve spelling among students with LDs in the performance test (n = 8).

| Dimension | Eta | eta square ² (η) | Effect size |
|-----------------------------------|------|------------------------------------|-------------|
| correct reading and pronunciation | .877 | .769 | Big |
| Arranging | .934 | .872 | Big |
| Discrimination | .966 | .933 | Big |
| Understanding of meanings | .820 | .673 | Big |
| Analysis | .972 | .946 | Big |
| Total | .962 | .925 | Big |

By extrapolating the results presented in the previous table, it became clear that the values of (η^2) associated with the size of the influence of the independent variable (the proposed program to improve spelling among students with LDs) on the skills of the performance test separately, and the test as a whole was high. The value of skills ranged between (0.673-0.948) and for the performance test as a whole (0.925). This means that (92.5%) of the variance occurring in the test as a whole, is all due to the independent variable (the proposed program to improve spelling among students with LDs).

Table 10. The Wilcoxon test for comparing the mean scores of the experimental group in the post and follow-up applications of the spelling test

| Skill | Average | N | average rank | Sum of ranks | U value | Sig. |
|-----------------------------------|----------------|----------------|--------------|--------------|---------|------|
| correct reading and pronunciation | Positive ranks | 2 ^a | 1.50 | 3.00 | - | .157 |
| | Negative ranks | 0 ^b | .00 | .00 | 1.414 | |
| Discrimination | Positive ranks | 1 ^d | 2.00 | 2.00 | - | .257 |
| | Negative ranks | 3 ^e | 2.67 | 8.00 | 1.134 | |
| Analysis | Positive ranks | 2 ^g | 1.50 | 3.00 | - | .061 |
| | Negative ranks | 5 ^h | 5.00 | 25.00 | 1.876 | |
| Understanding meanings | Positive ranks | 1 ^j | 1.00 | 1.00 | - | .655 |
| | Negative ranks | 1 ^k | 2.00 | 2.00 | .447 | |
| Arranging | Positive ranks | 0 ^m | .00 | .00 | - | .317 |
| | Negative ranks | 1 ⁿ | 1.00 | 1.00 | -1 | |
| Total | Positive ranks | 3 ^p | 3.00 | 9.00 | - | .203 |
| | Negative ranks | 5 ^q | 5.40 | 27.00 | 1.273 | |

a= the scores for the follow-up application are lower than the mean for the post-application

It is clear from Table (10) that there are no statistically significant differences between the mean ranks of the experimental group students in the post and follow-up applications of the spelling test (as a whole) and the general skills. The (Z) values of skills and the total test were (-1.414), (-1.134), (-1.876), (-0.447), (-1), (-1.273), respectively, all of which are not statistically significant values. this indicates that the effect of the proposed program to improve spelling among students with learning difficulties still exists.

Based on the results of the study, the researcher concluded a number of recommendations, which are:

- The Arabic language curricula should include exercises to develop the spelling skills of students with learning disabilities.
- Training special education teachers on how to develop spelling skills.
- Those in charge of Arabic language programs and curricula in the primary stage should be interested in developing the spelling skills of students with learning disabilities.
- Conducting more research on samples similar to the current study in order to identify the spelling skills in different grades.

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