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**Using Multi-Sensory Approach Based Activities for
Developing Dysgraphic Primary Stage Pupils' EFL
Writing Skills**

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Abstract

The main purpose of the study was to develop dysgraphic primary stage pupils' EFL writing skills through using the multi-sensory approach based activities. The study adopted the experimental design using one experimental group. The multi-sensory approach based activities were conducted to a sample of 15 pupils at Abdel-Aziz Aldereni primary school , Nabarouh city , Dakahlia Governorate during the second semester in the academic year 2020/2021. The researcher used Ahmed Zaki Saleh Pictoral Test , a checklist of primary dysgraphic pupils' writing disabilities , an EFL writing sub-skills checklist and a pre-post writing skills test as tools in this study to assess pupils' writing skills before and after the experimental treatment. The multi-sensory approach based activities were administered to the experimental group. The results indicated that: 1) there is a statistically significant difference at the 0.05 level between the mean ranks of the experimental group pre-post administration of the writing skills test in favor of the post administration. 2) The multi-sensory approach based activities achieved a significant effectiveness in developing EFL writing skills for the dysgraphic primary stage pupils.

Key words: Multi-sensory approach, EFL writing Skills, Dysgraphic primary pupils

مستخلص الدراسة:

إن من أهم أساسيات التعليم السليم هو أن يقو المتعلم بتنمية مهارات اللغة الأربعة : القراءة والكتابة والاستماع والتحدث . وتقوم هذه الدراسة باستهداف تنمية مهارة الكتابة في اللغة الإنجليزية. وقد هدفت هذه الدراسة الى التحقق من أثر استخدام أنشطة قائمة علي المدخل متعدد الحواس في تنمية مهارات الكتابة باللغة الانجليزية لدي تلاميذ المرحلة الابتدائية ذوي صعوبات الكتابة . وقد تبنت الدراسة التصميم التجريبي خدام مجموعة واحدة تجريبية حيث تم تدريس المجموعه التجريبية باستخدام المدخل متعدد الحواس . وقد أجريت الدراسة في مدرسه عبد العزيز الدريني -مدينة نبروه-محافظة الدقهلية واستخدمت الباحثة

قائمة لتحديد مهارات الكتابة اللازمه لدي طلاب الصف الثاني الابتدائي من ذوي الاحتياجات الخاصة لتحديد مجموعة الصعوبات الكتابية التي تواجه هؤلاء الطلاب وذلك بجانب اختبار المهارات الفرعية لمهارة الكتابة اختبار قبلي وبعدي. وقد أسفرت النتائج على وجود تحسن في مستوى طلبة الصف الثاني الابتدائي من ذوي الاحتياجات الخاصة في اختبار مهارة الكتابة، و بعد ذلك عند مقارنة درجات الطلبة قبل وبعد وهذه النتائج أكدت فاعليه استخدام أنشطة قائمة علي المدخل متعدد الحواس في تنميته كتابة وفي ضوء هذه النتائج قدمت الدراسة عدد من التوصيات تتعلق باهميه استخدام هذا الدخل في تدريس اللغة الانجليزية.

Introduction:

Language is a way of thinking through which human beings express their needs , desires , experiences and develop their abilities. English language is considered the first language being spoken by the majority of people all over the world . So, the importance of learning English language comes from this reason which is contacting with the world . English language is a way of interaction : social ,cultural and mental interaction.

Writing is a language communication tool which relates to transferring the ideas from the writer to the reader. Developing EFL writing skill is an essential goal of language teaching and learning. It is equated with speech because both of them are used for conveying ideas, notions and information. Writing is an important language activity and a major classroom procedure. It is important for providing evidence of our students' achievements (Millrood, 2001).

Orwig (1999) states that writing is more complicated than it seems right from the first sight because it has many other micro skills such as spelling, punctuation conventions, using orthography correctly and using vocabulary appropriately in an appropriate style. This confirms writing is the most complex language skill that language learners have to develop. Brown (2001) states that writing is a thinking process, a writer produces a final written product based on their thinking after he/she goes through the thinking process it has been shown that there is a lot of writing strategies which are used to develop EFL writing skill.

Many learners with learning disabilities (LD) face greater challenges than their peers without LD when learning how to write. Learners with struggle with LD generating topics, planning and organizing, editing, revising, monitoring the writing process, and transcribing words (Troia, 2006; Patel & Laud, 2007).

Dysgraphia is a brain-based learning disability that affects fine motor skills, particularly writing, through adulthood. It is more common in individuals with Attention- Deficit Hyperactivity Disorder(ADHD). Dysgraphia is a learning disability that affects writing ability and fine motor skills. It interferes with spelling, word spacing, and the general ability to put thoughts on paper, and makes the process of writing laboriously slow. Children with dysgraphia are often eager to avoid handwriting, particularly in front of their peers. They may feel embarrassed when writing on the board, produce less text than is necessary for written assignments, and can generally perform poorly on assessments that require written answers.

Brown (2001) states that writing is a thinking process, a writer produces a final written product based on their thinking after he/she goes through the thinking process. In other words, writing is a long process which starts at tracing letter in early stages of learning language, passing through advancing steps of paragraph writing including the pre-writing stage; brain storming , clustering, then drafting and finally editing.

EFL Writing Difficulties:

Because writing is a complex and difficult skill , a lot of learners face some difficulties during practicing writing . These difficulties appear in the sub-skills of writing such as : punctuation , spelling , grammar and handwriting mechanics.

The students with LD are not motivated to write in English for a number of possible reasons. First, physical condition means the atmosphere in class. Particularly, they are taught in a large class; overcrowded with too many students. Second, their English teachers use traditional teaching techniques such as methods of teaching English included the medium of instructions . Therefore, this lack of motivation can have a strong negative effect on the students' development in writing English and their low motivational intensity contribute to the students' vocabulary problems in writing (Al-Khasawneh, 2010).

Learners may face some problems during writing as the following:

1. problems with the content of language.
2. Problems in sentence structure ; how to build a correct sentences.
3. Problems in spelling words .
4. Problems in punctuation and capitalization.
5. Problems in grammar and language use.
6. Problems in coherence and cohesion of the text.
7. Problems in contacting messages to the reader.

Pickering (2004) indicated that LD students do not proceed smoothly through the sensitive periods as the normal student does. Chau (2011) added that they have areas of strength and areas of weakness as some perceptual areas are “arrested” at a younger level of development, so the more information is coming in through the senses, the more likely it is that the student will find a piece of that information relevant or interesting and give it a second look which will help the information be committed to memory.

Dysgraphia:

When learners face problems or difficulties in learning writing , the term dysgraphia appeared in the field of EFL . Dysgraphia refers to disability in spelling , handwriting and written composition. Dysgraphia is a brain-based learning disability that affects fine motor skills, particularly writing, through adulthood. It is more common in individuals with ADHD (Frye,2020).

Symptoms of Dysgraphia:

Learners with LD suffer from problems in learning and face difficulties in writing skills. They face problems in spelling , handwriting ,grammar and written composition. Frye(2020) mentioned some characteristics of dysgraphia as follows:

- Trouble forming letters or spacing words consistently.
- Awkward or painful grip on a pencil.
- Difficulty following a line or staying within margins.
- Trouble with sentence structure or following rules of grammar when writing, but not when speaking.
- Difficulty organizing or articulating thoughts on paper.
- Pronounced difference between spoken and written understanding of a topic.

Approaches For Developing Desgraphic Students' EFL Writing skills:

Writing is a skill needs to be developed and improved. Learners search for new approaches to develop their writing skill. Some researchers showed that co-operative learning has an essential effect on developing writing skill and at the same time treats writing difficulties. Co-operative learning could be an important learning model providing students with additional activities to reinforce the learnt material. One of these approaches used to improve writing among primary pupils is the multi-sensory approach.

The Multi-Sensory Approach:

The word "Multi" means more than one , so the term multi-sensory means more than one sense ; hearing , touching , seeing , movement . A multi-sensory approach is one that combines the use of two or more senses simultaneously. In a multi-sensory approach, a visual strategy is being used simultaneously with an auditory strategy and that for many learning tasks, kinesthetic and/or tactile strategies are also being used. For example, in working toward the sound–symbol association, if a student’s visual reinforcement is looking at a letter, the auditory reinforcement is to listen to and hear the sound and identify it with its symbol. The kinesthetic reinforcement stems from the learner’s feeling the articulator muscle movement associated with saying the phonemes (Maqbool & Ismail 2018).

Importance of Multi-sensory Approach:

Using multisensory teaching techniques may help teachers build on the students’ strongest learning modes while still addressing the weaker ones thus allowing students to have success in word acquisition (Ashbaugh ,2016). Morin(2014) explained that using multiple senses gives all kids more ways to connect with what they’re learning. This type of hands-on learning can make it easier for kids to:

- Collect information.
- Make connections between new information and what they already know.
- Understand and work through problems.
- Use nonverbal problem-solving skills.

The multi-sensory approach have also other advantages besides what mentioned above as follows:

- The multi- sensory approach increased the learner engagement.
- It generates a greater ability for learning.
- It encourages the learner for knowledge transfer.
- It improves learner achievement.
- It improves learner attitudes toward learning.

Multi-sensory Activities:

The multi- sensory approach includes different types of activities which the learner practices to develop and improve writing skill. These activities help students to increase their knowledge and acquisition for new vocabulary. In addition , multi-sensory activities enable students to improve

writing skill from the way they are good at and prefer to learn. VAKT (visual , auditory , kinesthetic and tactile) technique enables learners to recognize their sides of strength in learning process and encourage them to range from simple to complex, depending on the learners needs and the task at hand. Multi- sensory approach activities are one way to satisfy the different needs of a child.

The multi-sensory activities verify to meet the needs and desires of the students . There are different types of activities appeared in multi-sensory approach such as : writing with dough , word building kits , read it, write it, build it activity , writing words on sand , salt and shaving cream , using sand trays, textured objects, finger paints and puzzles ,etc. and modeling materials such as clay and sculpting materials. ‘air writing’ (a kinesthetic activity) is a great way to learn about sequencing of letter strokes by encouraging children to use not only their pointer finger, but also their whole arm to draw imaginary letters in the air. Hands on activities and multisensory activities are two very similar terms. Being "hands on" is being physically involved in the activities in some way.

The teacher can use different types of multi-sensory activities during the treatment. These activities help pupils to develop writing skill and make their learning enjoyable. Examples of multi-sensory activities are as follows:

- 1- Writing with dough
- 2- Word building kits
- 3- Read it, Write it, Build it
- 4- Writing words on sand , salt and shaving cream
- 5- Make your words vanish
- 6- Alphabet splat
- 7- Hopscotch ladders
- 8- Build your letters
- 9- Build Word Towers
- 10- Sensory treasure hunt

Related studies:

A great number of studies was conducted to show the effect of using different types of multi-sensory activities on the four language skills : writing , reading , speaking and listening. Wrighton (2010) conducted a study to determine the effectiveness of a multisensory approach to teaching the alphabet and phonemic awareness to kindergarten children .This study examined the differences in retention, transfer and usage of the alphabet and

phonemic awareness skills when taught directly through children's senses (eyes, mouth, ears, smell, and tactile and body movement) and those learning the alphabet and phonemic awareness skills through use of only their eyes, mouth, and ears. As this study showed, teachers may change the way they teach children of all ages. The researcher explained that Instruction can actually be accelerated for kindergarten students if children master both concrete and abstract concepts more easily and they can approach new learning and reinforcement through their senses and through the use of sensorial mnemonic devices that trigger and sustain memory. The findings of this study showed that: first, children learn most effectively by using the multi-sensory approach. Second, Through a better understanding of how a child's brain works, educational decision makers will be able to correlate the results of this study to curriculum development and instruction. Third, this study may help bring the findings in neuroscience that directly relate early reading to the classroom teacher. Fourth, this study needed to be replicated using a larger sample of students, completed in a more controlled testing environment. Any tests developed to assess upper and lowercase letters recognized by letter name, letter sound recognition, rhyming, blending, and segmenting will be appropriate because these skills are basic to alphabetic and phonemic awareness development and are readily available in schools across the United States. A longitudinal study would benefit the profession as it would show how children learn most effectively over the course of several years, if treatment were continued.

Jubran (2011) conducted a study to examine the effect of using multi-sensory approach on teaching English language. The participants of the study were distributed into two groups (experimental group and control group). The experimental group was taught English language using multi-sensory approach while the control group was taught English language using the traditional way of teaching. The results of this study concluded researcher the difference in the achievement of the tenth grade students was attributed to the using of multi-sensory approach for teaching English language. In addition, the improvement achieved by the experimental group may have been attributed to the way she rendered instruction; teaching English language using multi-sensory approach.

Stonier (2012) investigated the effect of multi-sensory approach into literacy instruction and the literacy development of preschoolers. The researcher conducted this study to explain that the preschoolers should have multiple opportunities to use their senses to manipulate, see, hear and say a variety of letters and sounds as a way to explore and refine their

understanding of the alphabetic principle. The results of this study concluded that Students needed opportunities to play with different types of literacy activities and in order to see that , it involved more than books and coloring activities, and students seemed to be more active in their learning when using multisensory activities. Activities including using shaving cream, sand , play-doh, promoted literacy skills .At the end of the of the activities ,the researcher noticed that all seven students were infusing letters into their pictures and also just simply writing letters without any picture such. All of the students were using alphabet charts more readily that had given to them at the beginning of the year. Furthermore , The use of different materials helped students become more hands-on with their learning. However , finding the right material is key to a successful multi-sensory activity . By trying out different materials , the researcher was able to figure out which one worked best of all students and which ones may be better for older students and/or a different kind of activity.

Maqbool& Hassan (2018) conducted a study investigates the traditional verbal lecture method and the multi-sensory approach toward ELT at degree level. It was an investigative method having four groups, two controlled groups and two experimental groups who attempted pre-test and post-test. The controlled groups were taught with traditional lecture method and the experimental groups were taught to multisensory approach. According to an analysis, 20 to 30 percent of the students in a class are auditory learners, which mean that they learn through reading or hearing. The rest are visual or kinesthetic or they learn through a combination of the above styles. The findings of the study led to the following conclusions; that every individual has a different learning style, almost 24% of the total students in a class are visual learners, 24% auditory, 40% are kinesthetic learners and almost 4% are of mixed learning ability which proved that almost every learner has his/her own learning style but every individual uses many types of learning styles at the same time to learn English language in order to fertile their various part of the brain, which makes the data easy to learn and understand and accessible for future recall. The percentage of the learning of experimental group was 22 % better than that of the controlled group, which concluded that the learning that has made through multi-sensory was more effective than the learning made through the traditional approach.

Based on the previously mentioned studies , it can be concluded that there are many studies conducted to show the effect of using the different types of multi-sensory approach on the EFL skills. The results of the current

studies agree with the previous studies in which the multi-sensory approach has a great effect on writing skill . In addition , the multi-sensory approach has an apparent effect on improving dysgraphia and helping the students with learning disabilities to develop their writing skill. To conclude , writing skill is a vital part in learners' life , so it is important to search for new strategies , techniques and activities to enhance learners' EFL writing skill. The various types of activities of multi-sensory approach help learners and learners with learning disabilities to enhance and develop writing skills.

Pilot study:

A pilot study was conducted for assessing pupils' level of writing skills. Through analyzing Connect 2 for second primary stage, it was found that the pupils are required to master some EFL writing skills for example:

- Writing the correct spelling of words (vocabulary).
- Writing a correct grammatical sentence.
- Re-arranging the sentences in the correct order.
- Problems in writing mechanics(hand writing).
- Punctuation.

To assess pupils' writing level , a writing test was designed and used for the pilot study. The results were as follow:

Table(1) Results of the pilot writing test

Skills	Maximum score	M .	SD.	Percentage
Grammar	2	1.3	0.79	65%
Punctuation	2	0.03	0.18	1.60%
Writing mechanics	2	0.66	0.47	33.30%
Rearranging sentences	6	1.26	1.8	21.10%
Spelling	8	2.5	2.35	32.10%
Total	20	5.8	4.33	29%

Based on the results shown in the previous table , it is obvious that pupils were weak in the target writing skills.

Statement of the problem:

Based on the literature review , related studies ,the results of the pilot study and the researcher experience , the problem of this study can be stated as follows:

The learners in the primary stage need a new approach to develop EFL writing skills . The researcher will investigate the effectiveness of using

activities based on the multi-sensory approach in developing the EFL writing skills of dysgraphic primary stage pupils.

Questions of the study:

This study answered the following questions:

1. What are the EFL writing skills that need to be mastered by the dysgraphic primary stage pupils?
2. What are the multi-sensory based-activities that can be used for developing EFL writing skills for the dysgraphic primary stage pupils?
3. What is the effectiveness of using the multi-sensory approach in developing EFL writing skills for the dysgraphic primary stage pupils?

Significance of the study:

The present study is significant for the following:

1. It provides a technique to develop EFL writing skills in the primary stage.
2. It directs English teachers to ways to develop the different writing skills.
3. It opens for the researchers fields to conduct studies and researches in the future to investigate new strategies to develop the other language skills at the primary stage :listening , speaking and reading.

Delimitations:

This study was delimited to the following:

1. Some writing sub- skills necessary for the target pupils as determined by the checklist : (spelling , grammar , punctuation and handwriting mechanics).
2. A group of second year primary stage dysgraphic pupils (15) as the participants of the study.
3. Three units from Connect 2 , second term for second year primary stage. This was implemented during the second semester of the academic year(2020-2021) lasted for 6 weeks (March & April).

Method of the study:

Participants:

The participants of the study were second year dysgraphic primary pupils from Abdel-Aziz Aldereni primary school , Nabarouh city , Dakahlia Governorate for the school year (2020-2021). The participants were fifteen (15) pupils as one experimental group.

Hypotheses of the study:

1. There is a statistically significant difference at 0.05 between the mean ranks of the experimental group pupils on both the pre- and post-administrations of the writing test in favor of the post-administration of the writing test.
2. The multi-sensory approach based activities achieve a significant effectiveness in developing EFL writing skills for the dysgraphic primary stage pupils.

Design of the research:

The researcher used the experimental design to investigate the effect of using the multi-sensory approach based activities on developing dysgraphic primary stage pupils' EFL writing skills. Participants were one experimental group. The teacher ; the researcher , taught the experimental group using the multi-sensory approach based activities.

Instruments :

The researcher used the following instruments to achieve the purpose of the study:

1. Ahmed Zaki Saleh Pictorial Intelligence Test.
2. A checklist of primary dysgraphic pupils' writing disabilities.
3. An EFL writing sub-skills checklist.
4. A Pre-post writing test.
5. A rubric of writing assessment criteria.

Procedures of the study:

1. Reviewing the literature related to variables of the study.
2. Presenting Ahmed Zaki Saleh Pictorial Intelligence Test to exclude the pupils with below average IQ(less than90).
3. Using an achievement test to select the pupils with learning disabilities.
4. Conducting a diagnostic test for diagnosing and selection of the participants with dysgraphia.
5. Designing a list of the writing disabilities of primary dysgraphic pupils to identify the participants of the study
6. Developing a checklist for determining the writing skills necessary for second year primary.
7. Presenting the checklist in the form of a questionnaire to a group of Jurors for determining the most necessary writing skills.
8. Developing the writing test and the rubric.

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9. Submitting the writing test on a group of jurors for validation.
 10. Designing the multi-sensory activities for developing EFL writing skills.
 11. Selecting the sample of the study.
 12. Administering the writing test to the experimental group at the beginning of the proposed treatment (pre-testing).
 13. Applying the multi-sensory approach based activities to the experimental group .
 14. Administering the writing post- test to the experimental group to measure improvement.
 15. Analyzing the data statistically.
 16. Discussing the results of the study.
 17. Suggesting conclusions and recommendations.

Definitions of terms:

Ureno (2012) mentioned that “multisensory” refers to VAKT (visual-auditory-kinesthetic-tactile) which implies that pupils learn best when information are presented in different modalities and means that pupils learn better when information is presented in different ways so that it is easier to connect and teach in a simpler and easier way.

In addition, Fisher (2016) reported that multi-sensory activities are naturally invigorating to pupils. Multi-sensory approach utilizes more than one sense in the teaching process to enhance the learning process of the pupils.

According to these definitions, multi-sensory approach was operationally defined as using all the senses : sight (visual) , hearing (auditory) , movement (kinesthetic) and touch (tactile) in learning the language skills . Examples of multi-sensory writing activities: writing with shaving cream , play dough letter formation , use writing trays , word building activity , writing in sand and buzz word activity.

Writing skills:

Silva and Matsuda (2002) defined writing as a complex phenomenon because it requires students to gain knowledge on linguistic, cognitive, and socio-cultural factors and to be able to integrate these factors with one another to produce a communicative piece of discourse.

Hyland (2003) argues that writing is conceived as a skill, and that skill is a process dependent upon a range of other skills.

Writing refers to “The domain of language proficiency that encompasses how students engage in written communication in a variety of forms for a variety of purposes and audiences.” (WIDA document, 2005).

Based on these definitions, writing skills are specific abilities which help pupils put their thoughts into words in a meaningful form. Examples of EFL writing skills for primary pupils include grammar , punctuation , spelling , re-arranging sentences in an correct order and writing mechanics.

Dysgraphic pupils :

Dysgraphic pupils are persons who have a brain-based learning disability that affects fine motor skills, particularly writing, through adulthood. It is more common in individuals with ADHD. Dysgraphia is a learning disability that affects writing ability and fine motor skills. It interferes with spelling, word spacing, and the general ability to put thoughts on paper, and makes the process of writing laboriously slow. Dysgraphia is a neurological disorder that can affect both children and adults.(Frye ,2020)

Based on this definition, dysgraphic pupils are learners who suffer from learning disability related to writing skills and writing expressions including spelling ,punctuation ,distinguish between letters , generating a correct sentence and handwriting problems.

Results & Discussion:

Hypothesis (1):

The first hypothesis stated that, "**There is a statistically significant difference at 0.05 between the mean ranks of the experimental group pupils on both the pre- and post-administration of the writing test in favor of the post-administration of the writing test.**"

To show the difference between the mean ranks of the pre- and post-administration of the writing test of the experimental group, the researcher used "**Wilcoxon Test**", non- parametric statistic (group size =15 ; fewer than 30). The following table shows " **Z** " values and its statistical significance of the difference between the pre- and post- writing test of the experimental group.

Table(2) " Z" value of the pre and post- writing test of the experimental group

Skills	Ranks	N	Mean Rank	Sum of Ranks	Z Value	Sig
Spelling	Negative Ranks	0	0	0	3.435	0.01
	Positive Ranks	15	8	120		
	Ties	0	--	--		
Punctuation	Negative Ranks	0	0	0	3.457	0.01
	Positive Ranks	15	8	120		
	Ties	0	--	--		
Grammar	Negative Ranks	0	0	0	3.443	0.01
	Positive Ranks	15	8	120		
	Ties	0	--	--		
Handwriting mechanics	Negative Ranks	0	0	0	3.482	0.01
	Positive Ranks	15	8	120		
	Ties	0	--	--		
Total	Negative Ranks	0	0	0	3.419	0.01
	Positive Ranks	15	8	120		
	Ties	0	--	--		

The table above indicates that "Z" values is statistically significant at 0.01 level in favor of the post administration of the writing test of the experimental group and this indicates that there is a difference between the mean rank of the experimental group in favor of the post administration of the writing test. Therefore, the first hypothesis was accepted. The significant difference between the pre and post administration of the writing test was due to the effectiveness of the multi-sensory approach based activities.

Hypothesis (2):

The second hypothesis stated that “ **The multi-sensory approach based activities achieve a significant effectiveness in developing EFL writing skills for the dysgraphic primary stage pupils.**”

In order to estimate the effect size of the multi-sensory approach based activities on dysgraphic primary stage pupils' EFL writing skills , the researcher used " **Mac Gujian**" equation. The following table shows the effect size of the multi-sensory approach based activities on dysgraphic primary stage pupils' EFL writing skills.

Table (3) The effect size of the multi-sensory approach based activities on dysgraphic primary stage pupils' EFL writing skills

Skills	Total Mark	Pre mean	Post mean	Effect size
Spelling	10	2.37	8.33	78.11%
Punctuation	6	1.23	5.13	81.76%
Grammar	8	2.13	7.07	84.16%
Handwriting mechanics	6	0.97	5.33	86.7%
Total	30	6.7	25.87	82.27%

The table above shows that the effect size of the multi-sensory approach based activities in developing dysgraphic primary stage pupils' EFL writing skills was high in which the effectiveness values of the writing skills ranged from (78.11%- 86.7%) , and the test total score was(82.27%). The values of the post mean of the writing test are (8.3 , 5.13 ,7.1 and 5.33).These values indicate that the effect size of the multi-sensory approach is high , therefore , this means that using the multi-sensory approach based activities has an apparent effect on developing writing skills for dysgraphic primary stage pupils . As well, the following chart shows the values of the effect size of overall writing skills:

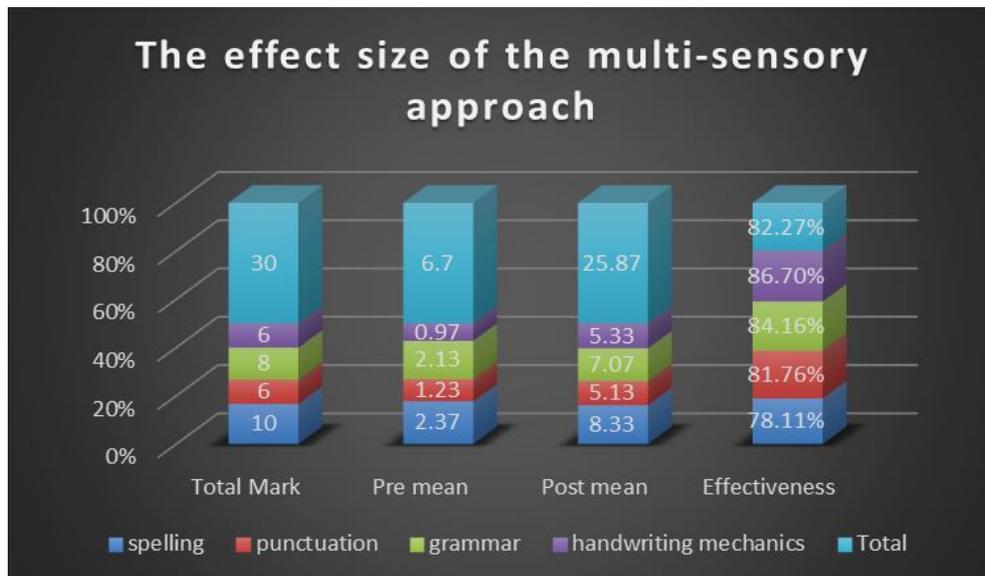


Figure (1) values of the effect size of writing skills

Figure (1) shows the following data:

1. 78% of the total variance in spelling skill can be attributed to the experimental treatment. This value indicates a high level of effect size of the experimental treatment upon the first skill.
2. 81% of the total difference in punctuation skill can be attributed to the experimental treatment. This value of the effect size of the experimental treatment upon the second skill.
3. 84% of the total difference in grammar skill can be attributed to the experimental treatment. This value of the effect size of the experimental treatment upon the third skill.
4. 86% of the total difference in handwriting mechanics skill can be attributed to the experimental treatment. This value of the effect size of the experimental treatment upon the fourth skill

Discussion of Results:

The above-mentioned results showed that there was a statistically significant difference in favor of the experimental group, as there was an apparent improvement in the EFL writing skills of the pupils on the post-administration of the study instrument. To illustrate, the researcher used the multi-sensory approach based activities to help pupils develop their writing skills. The researcher used different activities to allow pupils to engage in groups/peer learning to show their points of weakness and strength as well as the researcher gave them some suggestions which helped them to improve their awareness as dysgraphic primary pupils. These activities were as follows:

- Writing with dough
- Word building kits
- Read it, Write it, Build it
- Writing words on sand , salt and shaving cream
- Make your words vanish
- Alphabet splat
- Hopscotch ladders
- Build your letters
- Build Word Towers
- Sensory treasure hunt

The experimental group achieved a high level in writing skills as shown in the previous results. Moreover, the learners felt happy to learn through the activities of multi-sensory approach. These activities helped

pupils more than the traditional method of teaching through lessons and activities. pupils were fascinated by pictures, sounds, colors , using clay and motion. There also was an opportunity for pupils to apply what they have learnt.

To conclude , results of the present study were consistent with the results of the study conducted by Han HO, (2001) found in his study using multi-sensory approach to develop writing and reading skills, the multisensory training group, as compared to the traditional training group, showed greater improvement after training in reading, writing and understanding the trained and non- trained materials. The results suggested that multisensory training benefits dyslexic children in learning to read and write Chinese. Similarly, Stonier , (2012) concluded that using multisensory activities within literacy learning support students through literacy. Multi-sensory activities enable preschoolers to explore aspects of speaking, listening, viewing, reading and writing as well as expanding upon their skills. As well as , Obaid ,(2013) in her study the impact of using multi-sensory approach for teaching students with learning disabilities , found that there was a statistically significant difference at $\alpha=0.05$ between the achievement of the experimental group and that of the control group on the post-test in favor of the experimental group. This difference indicated that using multi-sensory approach may have had a positive effect on students' achievement. The mean score for the experimental group on the post-test was 85.58 while that of the control group was 76.15. In addition, studies conducted by researchers like Molenda and Bhavangri (2009), Walet(2011), Geiss, et al. (2012) , Phillips and Feng (2012), Ghoneim & Elghotmy(2015) and Gustafson (2018) supported the results of the current study .

The researcher noticed the following points during the experimental treatment:

1. pupils were excited with the new activities of the multi-sensory approach .They practiced it at the first time. They were happy with watching videos and playing with dough and magnetic letters.
2. Pupils were good participants during the treatment . Every pupil wanted to involve in doing activities and sharing information with their peers.
3. Pupils were encouraged to improve their writing skill to be good writer in spite of their little age.
4. As well , pupils decided to develop other language skills : reading , listening and speaking and this made their performance in learning.

Results:

The present study reached in the following findings:

1. A list of the appropriate writing skills to the EFL primary stage pupils was presented.
2. The multi-sensory approach based activities resulted in improving the dysgraphic pupils' writing skills.

The present research concluded that improving writing skills is possible through using the multi-sensory approach. It presented empirical evidence that primary dysgraphic pupils can be trained in using different writing activities. The following conclusions were reached:

1. The experimental group pupils' mean ranks in the post-administration of the writing test was much better than their mean score in the pre-administration of the test.
2. The multi-sensory approach based activities was effective in developing the EFL writing skills of second year primary stage dysgraphic pupils.

Recommendations :

Based on the previous results the present study recommends the following:

1. The writing skills should receive appropriate attention to be developed at the elementary education level especially the primary stages.
2. Raising the awareness of the students for the importance of using the multi-sensory approach to improve their writing skills and technology in general as a facilitator in the educational process.
3. Allowing students to practice using writing skills activities such as "writing the missing letters, writing new words through identifying pictures, rearranging sentences ,writing using handwriting mechanics etc.", would increase their writing skills.
4. Teaching students to be self-managed, autonomous learners who identify problems, and use active learning strategies would increase their writing skills.
5. Adequate teaching aids should be selected carefully while teaching the writing skills especially media which contain exciting pictures and clear sound.

Suggestions for further research :

The present study suggests the following researches:

1. Administering the multi-sensory approach to different stages (i.e., preparatory and secondary).
2. Using different technological methods for making the multi-sensory approach more enjoyable like gamification, songs, pictures, Google play apps, and 3D animation cartoons.
3. Using different platforms like Slide share , Edmodo, Author stream , Google Classroom ,Hello Slide and Slide Rocket.
5. Using different presentation programs like Canva , Google Slide , Digital storytelling and Power Point.

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