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# **The Effect of Differentiating Instruction using Multiple Intelligences on Improving Reading Comprehension of 5<sup>th</sup> Graders with Learning Disabilities**

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## **Abstract**

*This study investigated the effect of using differentiated instruction using multiple intelligences on improving reading comprehension of 5<sup>th</sup> graders with learning disabilities. A total of 60 students identified with LD participated. The sample was randomly divided into two groups; experimental ( n= 30 boys )and control ( n= 30 boys). ANCOVA and T .test were employed for data analysis. Findings from this study indicated the effectiveness of differentiated instruction using multiple intelligences on improving reading comprehension in the target students. On the basis of the findings, the study advocated for the effectiveness of using differentiated instruction using multiple intelligences on improving reading comprehension in learning disabled students.*

**Key words :** differentiated instruction, multiple intelligences, reading comprehension, learning disabilities

## **Introduction**

Reading is a process that requires beginning readers to develop fundamental skills such as recognizing the alphabet, developing phonics skills, understanding vocabulary and sentence structure, developing spelling proficiency, and practice in developing comprehension and fluency skills. A student's ability to master such a concept in primary grades establishes the groundwork needed for student achievement in reading and thereby in other subjects as well. If the ability to learn to read takes a prolonged time to develop, students may struggle to read in later grades (Nielsen, Winter ,Keetle& , Jackson, 2007)

Chapman and King (2009) stated that there are too many students who struggle to read and have difficulty completing literacy assignments. At the same time, advanced students are not being challenged. Researchers have demonstrated that differentiated instruction has been effective in some schools (Beecher & Sweeney, 2009) . VanSciver (2005) stated, "Teachers are now dealing with a level of academic diversity in their classrooms unheard of just a decade ago" (p. 534). In a single classroom, students' learning abilities may range from above grade level to below grade level. Levy (2008) stated that "students enter classrooms with different abilities, learning styles, and personalities...." (p. 161). Teachers need to find adequate strategies that provide students with the support needed to achieve standards presented through problem solving .Differentiating instruction by integrating student's multiple intelligences and learning style is one such strategy. According to Lawrence-Brown (2004), "with suitable supports, including differentiated instruction, students ranging from gifted to those with significant disabilities can receive an appropriate education in general education classrooms" (p.34).

McBride(2004) stated that "Differentiated instruction is vital to effecting positive change in student performance, because the one-strategy-fits-all approach doesn't work in a real classroom" (p. 39).

### *Benefits of Differentiated Instruction*

Servilio (2009) stated that differentiating instruction is "an individualized method of meeting all of the students' academic needs at their level" (p. 7). One benefit of differentiating instruction is that it helps teachers address the learning needs of each student. This can be accomplished by targeting the student characteristics Tomlinson (2001) identified as: readiness, interest, and learning profile. When planning for differentiated instruction, knowing students' interests and dominant learning styles, or profiles, can allow the teacher to plan

learning activities that specifically target what students would like to learn and how they learn best (Servilio, 2009). When teachers teach to students' readiness level, they can accommodate a student who has mastered the lesson content, and is ready to be challenged. In this case, a harder text or a more complicated project could be assigned. Once a need is identified, the teacher responds by finding a method or solution to answer the need in order for all students to be successful in learning (VanSciver, 2005). In these examples, the teacher is able to use differentiated instruction to meet the learning needs of their students.

Another benefit of differentiated instruction is that it leads to increased student achievement. Servilio (2009) stated "The combination of a differentiated curriculum and the options for student choice are ideal for promoting success for students with disabilities and it can improve outcomes for other students as well" (p. 10). In a differentiated classroom, when students are engaged and have achieved their goal or completed a task, they are more motivated to continue learning and exceed their original goal or expectation. "With the tools of differentiated instruction, we can take each child as far as he or she can go" (Levy, 2008, p. 164) towards further achievement and success.

### *Methods for Differentiating Instruction: Multiple Intelligences*

Harvard professor Howard Gardner first introduced the theory of multiple intelligences in the early 1980s. According to Armstrong (2003) "Gardner argues that traditional ideas about intelligence employed in educational and psychological circles for almost a hundred years require reform. In particular, he suggests that the concept of a "pure" intelligence that can be measured by a single I.Q. score is seriously flawed" (P. 12). Gardner has identified nine intelligences and has indicated there may be many more that people possess at varying levels. Gardner's theory is that the variability to which people possess a certain intelligence determines how they learn and interact best with other people.

Gardner (2003) summarized the first seven intelligences as follows:

1. Linguistic Intelligence. The understanding of the phonology, syntax, and semantics of language, and its pragmatic uses to convince others of a course of action, help one to remember information, explain or communicate knowledge, or reflect upon language itself.
- 2 Bodily-Kinesthetic Intelligence. The ability to control one's bodily motions and the capacity to handle objects skillfully.
3. Spatial Intelligence. The ability to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience (even in the absence of the relevant physical stimuli).
4. Musical Intelligence. The ability to understand and express components of music, including melodic and rhythmic patterns through figural or intuitive means (the natural musician) or through formal analytic means (the professional musician).
5. Logical Mathematical Intelligence. The understanding and use of logical structures, including patterns and relationships, and statements and

propositions, through experimentation, quantification, conceptualization, and classification.

6. Intrapersonal Intelligence. The ability to access one's emotional life through awareness of inner moods, intentions, motivations, potentials, temperaments, and desires, and the capacity to symbolize these inner experiences, and to apply these understandings to help one's own life.

7. Interpersonal Intelligence. The ability to notice and make distinctions among other individuals with respect to moods, temperaments, motivations, intentions, and to use this information in pragmatic ways, such as to persuade, influence, manipulate, mediate, or counsel individuals or groups of individuals toward some purpose (P.13-14)

According to Lazer (2004), using MI in the classroom makes lessons more interesting, which causes students to pay more attention to what is taught and then learned. As a result, students are more engaged, they remember more, and achievement increases. He also stated that when students become aware of their intelligence strengths and consider themselves as being "smart" in that area of intelligence, their self esteem is raised.

Mourad Ali & Amal Mostafa (2013) investigated the effect of using differentiated instruction by integrating multiple intelligences and learning styles on solving problems, achievement in, and attitudes towards math in six graders with learning disabilities in cooperative groups. A total of 60 students identified with LD were invited to participate. The sample was randomly divided into two groups; experimental (n= 30 boys) and control (n= 30 boys). ANCOVA and T-test were employed for data analysis. Findings from this study indicated the effectiveness of differentiated instruction by integrating multiple intelligences and learning styles on solving problems, achievement in, and attitudes towards math in the target students. On the basis of the findings, the study advocated for the effectiveness of using differentiated instruction by integrating multiple intelligences and learning styles on solving problems, achievement in, and attitudes towards math in learning disabled students.

Further research is necessary to build on the vast amount of research into differentiated instruction with learning disabled students. This will allow researchers to determine how differentiated instruction can be best used as an intervention with learning disabled students as there is a dearth of research with this population. In order to address this issue with the lack of research on differentiated instruction with learning disabled students. Thus the present study seeks to give answers to the following questions.

- 1- Are there differences in post-test scores mean between control and experimental groups on Reading Comprehension Test ?

2- If the programme is effective in improving reading comprehension of experimental group, is this effect still evident a month later?

## Method

### *Participants*

60 students participated in the present study. Each student participant met the following established criteria to be included in the study: (a) a diagnosis of LD by teacher's referral. Neurological scanning results indicated that those individuals were neurologically deficient (b) an IQ score on the Mental Abilities Test (Mosa, 1989) between 90 and 118 (c) reading performance scores at least 2 years below grade level (d) absence of any other disabling condition. Students were randomly classified into two groups: experimental (n= 30 boys) and control (n= 30 boys ).

The two groups were matched on age, IQ, and reading comprehension. Table 1. shows means, standard deviations, t- value, and significance level for experimental and control groups on age ( by month) , IQ and reading comprehension (pre-test).

Table 1. Means, standard deviations, t- value , and significance level for experimental and control groups on age ( by month),IQ, and reading comprehension ( pre-test).

Variable	Group	N	M	SD	T	Sig.
Age	Experimental	30	132.24	1.96	-.121	Not sig.
	Control	30	132.41	2.01		
IQ	Experimental	30	111.34	4.45	-.221	Not sig.
	Control	30	111.89	4.24		
Reading comprehension	Experimental	30	6.82	2.65	-.539	Not sig.
	Control	30	6.54	2.32		

Table 1. shows that all t- values did not reach significance level. This indicated that the two groups did not differ in age, IQ , and reading comprehension ( pre-test) .

### *Instrument*

*Reading Comprehension Test.* The test was developed to assess reading disabled children 's skills in reading comprehension. It was based on the features of comprehension skills recognized by Moored Ali ( 2005). The test consists of (22) items assessing word recognition, with score ranging from 0-1 on each item and a total score of 22. The test has demonstrated high internal consistency with Cronbach's  $\alpha$  ranging from 0.86 to 0.89.

### *Procedure*

Experimental – group students were taught in the " Technology Room " at EL Obour primary school after the school day ended .First the instructor (author) gave students an idea

about the MI theory and how it is useful in helping them achieve their lessons in different school subjects in general , and in reading skills in particular.

The MI program comprised 3 weekly sessions lasting between 40 and 45 min, and several homework tasks . The program lasted for 2 months. Over these sessions the students completed a total of twelve basic reading subskills, namely similar words recognition skill, opposite word recognition skill, odd word recognition skill, correct word recognition skill, relational sentences skill, answering questions skill, plausible and implausible sentences recognition skill, recognizing the message conveyed by the text skill, characterization skill, titling skill, cause–effect relation recognition skill.

During sessions, students were allowed to work together , and the instructor ( the author) gave help and modeling , if necessary. The seven intelligences were employed in all sessions. Employing verbal / linguistic intelligence requires students to brainstorm , use new vocabulary, and tell the story in their own words. While using logical / mathematical intelligence requires that students asking and answering questions about the text, and explain their answers. Students employed visual / spatial intelligence through illustrations, and using pictures of the new vocabulary. They also used role play, body movements, and concrete materials while learning the new word as part of bodily / kinesthetic intelligence. Musical / Rhythmic intelligence was employed by students. They created rhythmic patterns, and sang songs. Students shared work with one another, assessed peer's work, and worked collaboratively as part of their interpersonal intelligence. Additionally, each student had a space to work individually and reflect on his/her progress and achievement as part of his intrapersonal intelligence.

#### *Design and Analysis*

The effects of implementing the MI program on students' reading comprehension skills were assessed using a repeated-measures design, pre- post- and follow-up testing.

### **Results**

Table 2. shows data on ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in reading comprehension test. The table shows that the (F) value was (128.009) and it was significant value at the level (0.01).

Table 2. *ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in comprehension test*

<b>Source</b>	<b>Type III sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F</b>	<b>Sig.</b>
Pre	1.725	1	1.725		
Group	217.276	1	217.276	128.009	0.01
Error	317.340	57	5.567		
Total	1067.933	59			

Table 3 shows T. test results for the differences in post- test mean scores between experimental and control groups in reading comprehension test. The table shows that (t) vale was ( 11.67). This value is significant at the level (0.01) in the favor of experimental group. The table also shows that there are differences in post- test mean scores between experimental and control groups in comprehension test in the favor of experimental group .

Table 3. *T-test results for the differences in post- test mean scores between experimental and control groups in comprehension test*

Group	N	Mean	Std. deviation	t	Sig.
Experimental	30	13.50	1.10	11.67	0.01
Control	30	6.43	3.12		

Table 4. shows data on repeated measures analysis for reading comprehension test. The table shows that there are statistical differences between measures (pre- post- follow –up ) at the level (0.01).

Table 4. *Repeated measures analysis for comprehension test.*

Source	Type III sum of squares	df	Mean square	F	Sig.
Between groups	661.250	1	661.250		0.01
Error 1	105.611	58	1.821	363.148	
Between Measures	794.978	2	794.978	193.121	0.01
Measures x Groups	596.933	2	298.467	145.011	0.01
Error 2	238.756	116	2.058		

Table 5. shows data on Scheffe test for multi-comparisons in reading comprehension test. The table shows that there are statistical differences between pre and post measures in favor of post test , and between pre and sequential measures in favor of follow -up test , but no statistical differences between post and follow -up test .

Table 5. *Scheffe test for multi- comparisons in comprehension test*

Measure	Pre M= 6.76	Post M= 13.20	Sequential M= 12.86
re	--	--	--
Post	8.43*	--	--
Sequential	8.10*	.33	--

## Discussion

The main objective of the present study was to explore the effect of differentiated instruction using multiple intelligences on reading comprehension in 5th graders with learning disabilities .

The results of this study as revealed in tables 3, 5, show that the differentiated instruction that used multiple intelligences was effective in improving reading comprehension of students in experimental group, compared to the control group whose individuals were left to be taught in a traditional way.

Participants of this study fall into the minimum IQ of 90, nevertheless, they have learning disability. Thus IQ score cannot account for learning disabilities. The results of the present study support that conclusion with evidence that students who participated in the study do not fall into the low IQ range, however they have learning disabilities. When designing a program based on the differentiated instruction that used multiple intelligences, they had statistical increase in reading comprehension. This goes in line with what Mourad Ali et al ( 2006) notes that there is one problem "students who are identified as learning

disabled often cover any special abilities and talents, so their weakness becomes the focus of their teachers and peers, ignoring their abilities. Mourad Ali (2007), however, notes that "learning disabled, as well as gifted students can master the same contents and school subjects", but they need to do that in a way that is different from that used in our schools.

Experimental group gained better scores in reading comprehension than did control groups in post-tests though there were no statistical differences between the two groups in pre-test. This is due to the program which met the experimental group's needs and interests. On the contrary, the control group was left to be taught in a traditional way. This goes in line with our adopted perspective which indicates that traditional methods used in our schools do not direct students as individual toward tasks and materials, and do not challenge their abilities. This may lead students to hate all subjects and the school in general. On the contrary, when teachers adopt differentiated instruction that suits students interests and challenge their abilities with its various modalities.

This indicates that "as we learn more about the scope and complexity of individual differences and how they affect academic progress, we become increasingly convinced that many individuals who do not do well at school due to the instructional methods used to teach them does not complement preferred styles to learn, thus, we should seek strategies that help these students and match their strengths.

### **Implications**

The results of this study have several important implications. This study adds to the literature on the effectiveness of differentiated instruction with learning disabled students. Results appear to indicate that differentiated instruction are an effective instructional strategy for improving reading comprehension test scores of students with learning disabilities. This study has referential adequacy because this study could be replicated for any performance task by any teacher wanting to test how students perform when learning through using multiple intelligences.

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