A Training Programme based on Information Processing in View of Cerebral Hemisphere to Enhance Self- Regulation Skills and Its Effect on Reading Comprehension among a Sample of Preparatory School Pupils with English Learning Disabilities

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September 2017

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Abstract:

The study aimed to investigate the effectiveness of training programme based on Information Processing through Brain Dominance to enhance Self- Regulation skills and its effect on Reading Comprehension among the sample of preparatory school pupils with English learning disabilities. The sample of the study consisted of (40) pupils with English learning disabilities. The pupils divided into two groups; the experimental (20) pupils and the control group was (20) pupils. A pre and post- test design used for both groups. Author used alert cognitive style scale by Loren Crane 1989, Raven's progressive matrices, Self-Regulation skills scale, reading comprehension test designed by author. The findings showed that there were significant differences in self-regulation skills and reading comprehension favor to the experimental group. The results also showed that there were no significant differences in self-regulation and reading comprehension for follow up evaluation.

Key words: Information Processing, Self-Regulation skills, Reading comprehension, Cerebral Hemisphere, and Learning Disabilities.

Introduction:

Learning disabilities affected many people around the world. (LD) Is a generic term that refers to a- heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, or mathematical abilities (Wong&et al,2008). Students with (LD) have the cognitive tools needed to process information but do so very inefficiently. Descriptive research has consistently shown that many children with (LD) experience poor comprehension due to a failure to read strategically and to spontaneously monitor their understanding of what is being read, which indicates some sort breakdown in processing (Gersten& et al.,2001),(Graham& Bellert,2005).

Our aim in this article was to deal with Reading Comprehension disabilities in English language. Reading comprehension is a fundamental skill for all pupils in various academic stages, however, reading for understanding remains to be a challenge for many students. Instruction in reading comprehension, especially for poor readers and students with (LD), has been the focus of research over the last 30 years (Gajria, Jitendra, Sood, & Sacks, 2007). Pupils with (LD) face great difficulties in comprehending text due to some deficits that affect their reading skills and competence (Gersten& et al.,2001).There are many studies have been conducted to deal with reading comprehension in pupils with (LD). For instance,(Stevens,2016),(Eissa,2016) both of them reported that effectiveness of interventional programs to enhance reading comprehension in pupils of learning disabilities by using self-regulation skills and training on reading fluency. The current study aims to use information processing strategies to enhance self –regulation skills that will affect reading comprehension in pupils with (LD). Once students can successfully comprehend text using structured self-questioning, they may then begin to make the transition to more advanced self-questioning strategies. An example of a structured approach for self-monitoring reading comprehension was examined by (Taylor, Alber, and Walker,2002), all these skills related to self-regulation.

Self- regulation is considered to be a vital term, which defined as processes that serve to modulate reactivity, is a major contributor to the organization of temperament. Self- regulating processes include some skills as orienting, planning, self- evaluation, and monitoring (Vohs&Baumeister,2011). Self-regulation plays an- essential role among pupils with (LD), it helps them to overwhelm their disabilities in reading, writing, and problem-solving. Self-regulation in academic settings has been defined as the active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment (Pintrich,2000).It also refers to self-generated thoughts, feelings, and behaviors that are directed toward to achieving goals (Zimmerman, 2002). Self-regulation as a dynamic concept involves some skills as: self-monitoring: refers to the process of systematically attending to one's current actions, thoughts, emotions, or physiological reactions or their immediate antecedents or consequences over a sufficient period of time to allow for comprehensive and reliable sampling (Karoly,2005), self-evaluation: Zimmerman (2000) defined is as comparing self-monitored information with a standard or goal. Self-evaluation is a key process in goal evaluation, and students can choose from several criteria by which to evaluate the adequacy of their learning and performance, Planning: can be defined as a process that meets some set of objectives in order to achieve a desirable goal or outcome (Phillipson&Phillipson,2014), Rehearsal:

practicing a newly learned behavior in structures, a protective situation of role-playing. In this way, students can enhance their proficiency (Reynolds&Miller,2003), Stimulus control: refers to how precisely tuned an organism's behavior is too specific features of the environment (Dojman,2015), Self-reinforcement: refers to the administration of contingent rewards and punishments(Kaslow&Patterson,2002), Note-taking: it is the process or activity of noting down quickly, but briefly the most important points of a speech, discussion, presentation or lecture, It requires the capacity to listen attentively and objectively (Agarwal,2010), and self-talk: The internal dialogue that runs through a person's mind, self- talk forms and reinforces a person's self-image. Which affects their performance and stimulates more self-talk (Gibson,2015). All mentioned skills are related to self-regulation term, which considers a dynamic concept for (LD) students. Self-regulation is often a difficult skill for children with learning disabilities to master. As (Baird, Scott, Dearing, and Hamill ,2009) indicate that students with learning disabilities (LD) possess, a distinctive cognitive self-regulatory pattern, one that has been associated with such maladaptive approaches to learning as avoiding challenges, experiencing negative affect, exhibiting poor persistence and task abandonment, and showing a deterioration in performance following failure(Leins,2005). There are many articles reported that practicing on self-regulation skills help students to enhance their academic achievement as (Alharbi,2015)and(Hoover,2010).

The current study investigated enhancing self-regulations skills by using information processing strategies in view of the cerebral hemisphere. Information processing, which considers the following of information through the human nervous system, involving the operation of perceptual systems, memory stores, decision processes, and response mechanisms. Information processing psychology is the approach that concentrates on understanding these operations (Vandenbos,2013). Also, Information processing pervades biological systems. While it is known that there are information processing and propagation at the various levels of detail, such as within gene regulatory networks, within chemical pathways in cells, between cells in tissues, and between organisms of population, it has biological systems that are constantly engaged in activities that can be perceived in term of information processing such as perception, cognition, and language use (Niiranen& Ribeiro,2011). Information processing as a concise system Involves some strategies as sequential, processing, mental imagery, clustering, and rehearsal strategies that enable people to receive, process, store, and retrieve their information. Moreover, Information processing helps people to analyze everything around them by using the above-mentioned strategies.

Questions of the study: The current study seeks to answer the following questions:

- Are there significant differences between average sort grades for students of the experimental group and control group on the scale of Self-Regulation Skills favor of the experimental group?
- Are there significant differences among average sort grades for students of the experimental group in two measurements pre and post on Self-Regulation Skills scale attributed to the program for the post-measurement?
- Are there significant differences among average sort grades for students of the experimental group on post and follow up test for self-regulation skills scale?
- Are there significant differences between average sort grades for students of the experimental group and control group on the scale of reading comprehension test favor of the experimental group?
- Are there significant differences among average sort grades for students of the experimental group in two measurements pre and post on reading comprehension test attributed to the program for the post-measurement?
- Are there no significant differences among average sort grades for students of the experimental group on post and follow up test for reading comprehension test

Method and Procedures:

Population of the study and its sample:

The sample consisted of grade eighth and ninth preparatory pupils at the future governmental school, totaling (200) pupils, and the average of (100) pupils in grade eighth and (100) in grade ninth. The reading comprehension scale was applied to them to prepare pupils who obtained lower scores, furthermore, self-regulation skills scale was applied to pupils to prepare pupils who obtained lower scores, also, the alert scale of cognitive style by Loren, D, Crane was applied to differentiate cerebral hemisphere among pupils. Accordingly, the sample consisted of (40) pupils, amongst them (20) from grade eighth and (20) from grade ninth, who received low scores on reading comprehension test and self-regulation skills scale. Table1, 2, 3,4and5 show matching of the study sample according to their variables, class, and group.Matching between experimental and control group before applying the training programme

1- **Individuals' age**: author compared individuals' age by Mann-Whitney test.

Table (1)

Significant difference between average grades for age of experimental and control group

Group	n	Arithmetic average	Standard deviation	Grades average	Total grades	Valued U	Valued Z	Significance level
Experimental	20	13.95	0.826	19.18	383.5	173.5	0.761	Insignificant
control	20	14.15	0.875	21.83	436.5			

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

Given previous table, the calculated value for (Z)= (0.791) this is less than border value (1.96), this reveals that there are no statistically significant differences in age variable among experimental and control group.

2- **Intelligence level**: author compared average grades among experimental and control group for intelligence level by Raven progressive matrices scale by Mann-Whitney test.

Table (2)

Significant difference between average grades for intelligence level of experimental and Control group

(n=40)

Group	n	Arithmetic average	Standard deviation	Grades average	Total grades	Valued U	Valued Z	Significance level
Experimental	20	101.75	4.700	21.6	432	178	0.596	Insignificant
control	20	100.5	5.568	19.4	388			

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

Given previous table, the calculated value for (Z)= (0.596) this is less than border value (1.96), this reveals that there are no statistically significant differences in intelligence variable among experimental and control group on Raven progressive matrices scale.

3- Distribution in Cerebral Hemisphere between experimental and control group:

Table (3)
(n=40)

Hemisphere	Experimental group		Control group		overall
	Grade eighth N=10	Grade ninth N=10	Grade eighth N=10	Grade ninth N= 10	N=40
Right	1	2	2	1	6
Left	7	7	6	7	27
Integrated	2	1	2	2	7
Overall	10	10	10	10	40

4- **Self-regulation skills levels**: author compared average grades on experimental and control group on self-regulation skills before applying the training programme by Mann- Whitney test:

Table(4)
Significant difference between average grades for self-regulation skills of experimental and control group

Skills	Group name	n	Arithmetic average	Standard deviation	Grades average	Total average	Valued U	Valued Z	Significant level
Planning	experimental	20	25.65	3.066	20.53	410.5	199.5	0.014	Insignificant
	Control	20	25.70	2.886	20.48	409.5			
Monitoring	Experimental	20	26.70	2.830	21.68	433.5	176.5	0.639	Insignificant
	Control	20	26	2.974	19.33	386.5			
Self- evaluation	Experimental	20	27.30	2.386	19.48	389.5	179.5	0.559	Insignificant
	Control	20	27.75	2.881	21.53	430.5			
self- reinforcement	Experimental	20	26.40	2.437	20.6	412	198	0.055	Insignificant
	Control	20	26.20	2.726	20.4	408			
Control- stimuli	Experimental	20	25.55	2.460	18.05	361	151	1.339	Insignificant
	Control	20	26.50	2.565	22.95	459			
Rehearsal & self- talk	Experimental	20	45.90	6.146	19.35	387	177	0.624	Insignificant
	Control	20	47.15	4.158	21.65	433			
Note- taking	Experimental	20	22.60	3.068	19.55	391	181	0.516	Insignificant
	Control	20	23.15	3.514	21.45	429			
Overall score	Experimental	20	200.1	14.422	18.77	375.5	165	0.934	Insignificant
	control	20	202.4	14.413	22.23	444.5			

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96
Given previous table, the calculated value for (Z)for all scale's dimensions and overall score are less than border value (1.96), this reveals that there are no statistically significant differences in self-regulation skills variable among experimental and control group on the scale before applying the training programme.

5- **Reading comprehension test**: author compared grades average of members for experimental and control group on reading comprehension test by Mann-Whitney test before applying the training programme

Table (5)

Significant differences between average sort grades for students of the experimental group and control group on reading comprehension test before applying the training programme

(N=40)

Group	n	Arithmetic average	Standard Deviation	Grades average	Total grades	Valued U	Valued Z	Significance level
Experimental	20	5.25	2.149	22.33	446.5	163.5	0.998	Insignificant
Control	20	4.60	2.162	18.68	373.5			

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96
Given previous table, the calculated value for (Z)= (0.998) this is less than border value (1.96), this reveals that there are no statistically significant differences in reading comprehension variable among experimental and control group on reading comprehension test before applying the training programme.

Tools of the study:

1- Alert scale of cognitive style: has been prepared by using the original scale by Loren, D,Crane (1989). To ensure the validity and reliability of the scale have been verified in the current study, author used internal consistency method and extracted. Also, the reliability of the scale has been verified by split- half by spearman correlation coefficient was (0.802), and Kudr Richardson equation was, (0.821).

2- Self-regulation skills scale: this scale prepared by author it was a tool to identify the level of self-regulation skills among pupils of the study, the scale consists of (73) items scaled on grades of six alternatives:

(Completely agree, agree, agree to some extent, refuse to some extent, refuse, and completely refuse) author calculated validity of the scale by internal consistency and calculated the correlation of each item with the overall scale coefficient was statistically significant at (0.01) on (0.257) and (0.05) on (0.197). The reliability of the scale calculated by alpha Cronbach and was statistically significant at (0.01).

3- English Reading Comprehension disabilities test: this scale prepared by author it was a tool to identify disabilities in English reading comprehension disabilities. As was also extracted, the criterion validity calculated the correlation coefficient was (0.594) it is significant at (0.01). The reliability of the scale has been verified by split-half for Spearman the correlation coefficient was (0.829) and Kudr Richardson equation the correlation coefficient was (0.817).

4- Coloured Progressive Matrices: the scale designed by John Raven , the scale consists three groups each groups contains (12) matrices . The scale has high reliability and validity, the correlation coefficient for some studies reached between (0.91-0.62). The scale has the ability to identify (IQ) for people from age (5.6-85) years.

5- Quick Neurological Screening test: for Mutti & et al the test is designed to be used for students age 5 and older, and can be given in approximately 20 to 30 minutes. Raw scores are interpreted in terms of functional categories. The QNST- is designed to screen for neurological soft signs that may indicate challenges in motor coordination, daily functioning, and learning.

6- The training programme: The training programme is based on the basis of educational literature previously related studies, the programme consists of 20 sessions, and each one lasts for one an hour, including a range of activities and exercises. The programme is based on Information Processing; therefore, it aimed to change wrong ideas and beliefs that cause problems in general life and academic achievement. The programme used various strategies for information processing theory as:

a. **Sequential Processing Strategy**: refers to a child's ability to solve problems by mentally arranging input in sequential or serial order (Kaplan&Saccuzzo,2017).

b. **Simultaneous Processing Strategy**: is other primary mode of coding and problem solving , it involves the integration of separate stimuli into a conceptual whole in which all of the elements of the stimuli are interrelated

(Dehan,2006).

c. **Mental Imagery Strategy**: refers to the efficient use of self-awareness to self- regulate occupational performances (Shimamura, 2000).

d. **Elaboration Strategy**: it is the process through which the learner builds an internal and stable connection between the content to be learned and previous knowledge (Richey, 2013).

e. **Rehearsal Strategies**: Use repetitive exposure to what the student is trying to learn. Examples of rehearsal strategies include repeating a definition over

and over, using flash cards, and highlighting material in a text (Bembenutty,2011).

f. **Chunking Strategy**: it is a collection of elements having strong associations with one another, but weak associations with elements within other chunks (Gobet& et al.,2001).

Table (6)

General Schema for the training programme which based on Information processing in View of Cerebral Hemisphere to Enhance Self- Regulation Skills and Its Effect on Reading Comprehension among a Sample of Preparatory School Pupils with English Learning Disabilities

Session No	Techniques	Instruments	Content	Time
1	Lecture, discussion, homework.	Board, pens and colored pencils.	- Recognize programme's aims, students get to know each other. - Set time and nature of training sessions. - write report about first session.	60 minutes
2	Lecture , discussion, note-taking, Homework.	Computer, Pens, Papers.	- To recognize self-regulation& information processing - Compare human's information processing and computer processing. - Each pupil writes a situation explains how he processes and organizes his information.	60 minutes
3	Lecture, discussion, feedback.	Pens, papers, dictionaries.	- Understand meaning of chunking strategy. - Introduce main ideas of reading texts.	60 minutes
4	Lecture, Reinforcement, homework.	Computer, pens, colors	- Understanding monitoring comprehension strategy. - Practice real example about mentioned strategy - write summary about reasons of climate change as mentioned in the session.	60 minutes
5	Lecture, monitoring comprehension strategy, discussion, homework.	Pens, colors, computer.	- Clarify meaning of mental imagery strategy. - Use mentioned strategy in collecting data about any problem or situation. - Each pupil performs conversation about the training session in English language.	60 minutes

6	Discussion, lecture, homework	Dictionaries, colors.	- Explain meaning of simultaneous processing strategy. - Use mentioned strategy in developing self-regulation skills. - Each pupil writes a plan about whole session individually.	60 minutes
7	Reinforcement ,lecture, homework	Computer, board.	- Explain meaning of sequential processing strategy. - Use mentioned strategy in developing self-regulation skills. - apply comparison between e-books and traditional books as homework.	60 minutes
8	Lecture, reinforcement, homework	Computer, dictionaries.	- Explain meaning of clustering strategy. - Use mentioned strategy in life and academic situations. - Each pupil writes a report to summarize previous sessions.	60 minutes
9	Sequential processing strategy, regulation strategies.	Board, pens, colored pencils.	- Explain meaning of self-regulation. - Clarify characteristics of pupils self-regulated. - Each pupil writes a definition for self-regulation from his point of view and presents to his colleagues.	60 minutes
10	Sequential and simultaneous processing strategies.	Board, pens, colored pencils.	- Specify planning skill meaning. - Introduce clarified examples for planning skill and its goals.	60 minutes
11	Mental imagery, sequential processing strategy.	Board, pens, colored pencils.	- Clarify meaning of self-monitoring skill. - Pupils practice examples for self-monitoring. - Write homework to perform monitoring skill.	60 minutes
12	Elaboration and regulation strategies.	Board, pens, colored pencils.	- Identify meaning of evaluation. - Introduce various examples for evaluation. - Clarify Elaboration strategy meaning.	60 minutes
13	Elaboration and regulation strategies.	Computer, board.	- Revise previous skills. - Apply previous skills in real examples. - Each pupil writes a report about his benefits.	60 minutes

14	Monitoring comprehension and simultaneous strategies.	Board, pens, colored pencils, discussion.	- Explain meaning of self-reinforcement. - Introduce a discussion about self-reinforcement.	60 minutes
15	Rehearsal and clustering strategies.	Board, pens, role-play, colored pencils.	- Introduce rehearsal meaning skill. - Apply activities related to rehearsal strategy.	60 minutes
16	Chunking and mental imagery strategies.	Class board, colored pencils.	- Identify stimuli control meaning. - Introduce and apply real examples about mentioned skill.	60 minutes
17	Elaboration and clustering strategies role-play.	Computer, papers, colored pencils.	- Introduce revision about previous skills and strategies. - Each pupil introduce a brief Report to his colleagues.	60 minutes
18	Chunking and monitoring comprehension strategies, homework.	Dictionaries, computer, papers, pens.	- Clarify meaning of note-taking skill. - Provide pupils with various examples about note-taking. - Explain the importance of mentioned skill in academic field.	60 minutes
19	Mental imagery and elaboration strategies, homework.	Class board, pens, papers, colored pencils.	- Explain meaning of self-talking. - Explain the importance of positive self-talking before doing any activity.	60 minutes
20	Monitoring comprehension, chunking, lecture, discussion, clustering.	Computer, class board, papers, pens.	- Introduce revision about previous skills. - Each pupil writes his feedback about the training programme. - Apply post-test for the experimental group and set appointment for follow up evaluation.	60 minutes

Results of the study:

The answer to the first question: Are there significant differences between average sort grades for students of the experimental group and control group on the scale of Self-Regulation Skills favor of the experimental group? To ensure the answer of this question the Mann-Whitney non-parametric test has been used, **Table** (7) illustrates that:

Table(7)

Significant differences between average sort grades for students of the experimental group and control group on the scale of Self-Regulation Skills for post measurement

(n=40)

Skills	Group name	n	Arithmetic average	Standard deviation	Grades average	Total average	Valued U	Valued Z	Significant level
Planning	experimental	20	44.55	3.720	30.5	610	0	5.416	0.01
	Control	20	25.85	3.031	10.5	210			
Monitoring	Experimental	20	46.35	3.977	30.5	610	0	5.422	0.01
	Control	20	26.15	3.183	10.5	210			
Self- evaluation	Experimental	20	47	3.642	30.5	610	0	5.425	0.01
	Control	20	27.8	3.122	10.5	210			
self- reinforcement	Experimental	20	47.25	3.242	30.5	610	0	5.424	0.01
	Control	20	26.45	2.856	10.5	210			
Control- stimuli	Experimental	20	47.50	3.035	30.5	610	0	5.421	0.01
	Control	20	26.75	2.731	10.5	210			
Rehearsal & self- talk	Experimental	20	75.80	5.288	30.5	610	0	5.414	0.01
	Control	20	47.25	4.315	10.5	210			
Note- taking	Experimental	20	34.75	3.093	30.43	608.5	1.5	5.377	0.01
	Control	20	23.70	3.230	10.58	211.5			
Overall score	Experimental	20	343.20	18.721	30.5	610	0	5.411	0.01
	control	20	203.95	14.666	10.5	210			

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

In view of the previous table, calculated values for (Z) for self-regulation skills scale are more than border value (2.58), this denoted that statistically significant differences in (0.01α) among average sort for students of the experimental group and control group on the scale of Self-Regulation Skills favor of the experimental group, this is due to the effect of the training programme in comparison with control group that did not expose to this programme.

The answer to the second question: Are there significant differences among average sort grades for students of the experimental group in two measurements pre and post on Self-Regulation Skills scale attributed to the program for the post-measurement? To ensure the answer of this question the Wilcoxon non-parametric test has been used, **Table** (8) illustrates that:

Table (8)

Significant differences among average sort grades for pupils of the of the experimental group on Self-Regulation Skills scale for post measurement

(n=20)

skills	Grades differences	n	Grades average	Total grades	Valued Z	Significance level
Planning	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.926	0.01
Monitoring	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.922	0.01
Self-evaluation	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.931	0.01
Self-reinforcement	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.926	0.01
Control stimuli	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.927	0.01
Rehearsal& self-talk	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.923	0.01
Note-taking	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.925	0.01
Overall score	Negative grades Positive grades Equal	0 20 0	0 10.5	0 210	3.920	0.01

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

In view of the previous table, calculated values for (Z) for self-regulation skills scale are higher than borders values (2.58), this indicated that statistical significant differences in (0.01α) among average sort for students of the experimental group on the scale of Self-Regulation Skills favor to post measurement, it means the improvement of pupils in the experimental group after finishing the training programme

The answer to the third question: Are there significant differences among average sort grades for students of the experimental group on post and follow up test for self-regulation skills scale?

To ensure the answer of this question the Wilcoxon non-parametric test has been used, **Table** (8) illustrates that:

Table(9)

Significant differences among average sort grades for students of the experimental group on post and follow up test for self-regulation skills scale (n=20)

skills	Grades differences	n	Grades average	Total grades	Valued Z	Significance level
Planning	Negative grades	2	4.75	9.5	0.791	Insignificant
	Positive grades	5	3.70	18.5		
	Equal	13				
Monitoring	Negative grades	3	5.5	16.5	0.214	Insignificant
	Positive grades	5	3.9	19.5		
	Equal	12				
Self–evaluation	Negative grades	3	3.83	11.5	0.933	Insignificant
	Positive grades	5	4.90	24.5		
	Equal	12				
Self–reinforcement	Negative grades	5	5.7	28.5	1.496	Insignificant
	Positive grades	3	2.5	7.5		
	Equal	12				
Control stimuli	Negative grades	3	4.33	13	0.722	Insignificant
	Positive grades	5	4.60	23		
	Equal	12				
Rehearsal& self–talk	Negative grades	3	7	21	0.690	Insignificant
	Positive grades	7	4.86	34		
	Equal	10				
Note–taking	Negative grades	4	5.5	22	0.587	Insignificant
	Positive grades	4	3.5	14		
	Equal	12				
Overall score	Negative grades	6	13.33	80	0.241	Insignificant
	Positive grades	12	7.58	91		
	Equal	2				

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

It is apparent from previous table, calculated values for (Z) for self-regulation skills scale are less than border values (1.96), this means that there are no significant differences among average sort grades for students of the experimental group on post and follow up test for self-regulation skills scale; this is due to continuing effect of the training programme

The answer to question four: Are there significant differences between average sort grades for students of the experimental group and control group on the scale of reading comprehension test favor of the experimental group? To ensure the answer of this question the Mann-Whitney non-parametric test has been used, **Table** (10) illustrates that:

Table(10)

Significant differences between average sort grades for students of the experimental group and control group on the scale of reading comprehension test for post measurement

(N=40)

Group	n	Arithmetic average	Standard Deviation	Grades average	Total grades	Valued U	Valued Z	Significance level
Experimental	20	14.4	1.930	30.5	610	0	5.424	0.01
Control	20	5	2.714	10.5	210			

Significance level (0.01α)= 2.58 significance level(0.05α)=1.96

It is apparent from the previous table, calculated values for (Z) for reading comprehension test are more than border values (2.58), this there significant differences between average sort grades for students of the experimental group and control group on the test of reading comprehension favor of the experimental group, this means that there is improvement for all individuals of the experimental group after the training programme.

The answer to question five: Are there significant differences among average sort grades for students of the experimental group in two measurements pre and post on reading comprehension test attributed to the program for the post-measurement? To ensure the answer of this question the Wilcoxon non-parametric test has been used, **Table** (11) illustrates that:

Table(11)

Significant differences among average sort grades for students of the experimental group in two measurements pre and post on reading comprehension test for post measurement

(n=20)

Grades differences	n	Grades average	Total grades	Valued Z	Significance level
Negative grades	0	0	0	3.965	0.01
Positive grades	20	10.5	210		
Equal	0				

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

It is apparent from the previous table, calculated value for (Z) for reading comprehension test is more than border value (2.58.), this means that there significant differences among average sort grades for students of the experimental group in two measurements pre and post on reading comprehension test attributed to the program for the post measurement .

The answer to question six: Are there significant differences among average sort grades for students of the experimental group on post and follow up test for reading comprehension test?To ensure the answer of this question the Wilcoxon non-parametric test has been used, **Table** (12) illustrates that:

Table(12)

Significant differences among average sort grades for students of the experimental group on post and follow up test for reading comprehension test (n=20)

Grades differences	n	Grades average	Total grades	Values z	Significance level
Negative grades	6	6.75	40.5	1.151	Insignificant
Positive grades	9	8.83	79.5		
Equal	5				

Significance level (0.01α)= 2.58 significance level (0.05α)=1.96

It is apparent from the previous table, calculated value for (Z) reading comprehension test are less than border value (1.96), this means that there are no significant differences among average sort grades for students of the experimental group on post and follow up test for reading comprehension test; this is due to continuing effect of the training programme.

Discussion of the results:

The results revealed there are statistically significant differences between average sort grades for students of the experimental group and control group on scales of self-regulation skills and reading comprehension test favor of the experimental group. The level of these skills have improved in the experimental group due to their exposure to the training program which based on information processing and its various strategies, also, their commitment in all sessions of the training program helped them to obtain skills like planning, self- monitoring, and other self-regulation skills. It was clear that they were able to gain various experiences that offered by the program these were due to using techniques as lecture and discussion which encouraged students to express their views and acquire more experiences by using advanced techniques as computerized programs this is also agreed with (Bari,2012) study which aimed to enhance self-regulation skills among a sample of students with learning disabilities. In addition to the above-mentioned techniques, pupils of experimental group who tended to depend on using left brain hemisphere were interested to read details more than others who depended on using right hemisphere or others who have integral between two of them. Also, they had high abilities to appreciate differences between things more than others. All pupils of the experimental group exposed to using both hemispheres in view of the training programme by interacting and participating with each other in various activities of the programme.

Furthermore, pupils of the experimental group exposed to different enriched activities that helped them to enhance their abilities in reading comprehension by doing their home works and applying all activities that related to reading skills. They had to discuss their response to various activities that they used to do at homes in each session to ensure their understanding of everything; it helped them to gather data and ideas about every task and have interaction during sessions of the training programme. Also, the using of information processing strategies supported pupils of the experimental group to control, monitor, and analysis their performance to overwhelm their disabilities. Obviously, pupils who depend on right hemisphere tended to use rhetorical methods, when they were dealing with various texts, in the contrast pupils of left hemisphere used to deal directly with language tasks; it was clear that pupils who have integration between both hemisphere have balance in using right and left sides, these results agreed with (Spironelli&et al,2008) which denoted

the importance on training to use both sides of brain to overwhelm reading disabilities.

Consequently, the results revealed that there are significant differences among average sort grades for students of the experimental group in two measurements pre and post on self- regulation skills scale and reading comprehension test attributed to the program for the post measurement. It was logical to have these results in view of exposure of the experimental group to the training programme, and its various strategies that enriched their abilities to enhance self- regulation skills; these strategies as sequential processing, simultaneous processing, mental imagery, and clustering strategy aroused pupils' abilities and motivations to have commitment in the training programme in order to be able to enhance their self-regulation skills that consider being great skills to develop various processes of learning and educational methods as (Montague,2008) reported in his study that training on self-regulation supports students to improve their problem-solving skills . All mentioned methods and techniques helped students to improve their reading comprehension skills as doing summarizing and chunking to text parts. They were able to organize their tasks cooperatively to support each.

Moreover, interactions between pupils during training sessions helped them to express their opinions in a logical and analytical manner as brain-left pupils did; they were able to organize all ideas that related to home works activities. On the other hand, pupils who were depending on right hemisphere used to answer long essay questions more than choosing questions, they were precise in their answers for all questions that related to essays, they also tended to perform all tasks that related to drawing better than others who depend on left hemisphere, it was clear that pupils who have integration between both hemisphere performed their tasks in an innovative manner. The interaction between all pupils helped them to exchange their educational experiences according to the diversity among them in cerebral hemisphere, in that way they were able to activate both hemispheres as (Moncreiff,2010) denoted in his study that there is a consistency between hemisphere working to some extent. Also, the training on self-regulation skills enhanced pupils' reading comprehension skills as (oladele&Oladele,2016) in their study.

Additionally, the study asserted that there are no significant differences among average sort grades for students of the experimental group on post and follow up test for self-regulation skills scale and reading comprehension test all these due to the training programme, which would enhance self-regulation skills and reading comprehension levels among pupils of the experimental group. Perhaps, this can be explained, because of the procedures and activities that included in the training programme, it have been based on information processing strategies that created an opportunity for all pupils of the experimental group to be aware of self-regulation skills and improved their reading comprehension levels even after finishing training programme sessions with one month ; this was because the continuing effect of the training programme this result agreed with (Taft,2010) study which aimed to improve self-regulation and self-talking in students with learning disabilities. This result attributed to pupils' positive participation in training sessions and applying what they have learned in the programme after finishing training period as it becomes part of their life routine. They have achieved development in their academic skills that were of the constructive effect that the training programme aimed to, these results met with (Gifford,2014) results of this study to improve reading comprehension by using self-regulation skills in students with learning disabilities.

Conclusion:

The current study aimed to demonstrate the effect of the training programme based on information processing in view of the cerebral hemisphere to enhance self-regulation skills and its effect on reading comprehension among a sample of preparatory school pupils with English learning disabilities. The results showed the effect of the programme in enhancing self-regulation skills and reading comprehension levels among the sample of the study per favor to the experimental group, and in view of these results the- current study recommends that responsible educators and counselors should build and apply same programs on other members from high schools students to enhance their academic skills. According to results of this study, we can say that teachers themselves have to participate in workshops to know how to design training programs for all students who have exceptional abilities in view of the cerebral hemisphere, and using self- regulation strategies in teaching languages and other subjects.

The results of the study revealed there are no significant differences there significant differences among average sort grades for students of the experimental group on post and follow up test for reading comprehension test and self-regulation skills scale due to the training programme and its continuing effect for all pupils, so educators have to make learning based on learners themselves to be active in their learning process..

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