Reality Therapy Group Counseling Approach On Metacognitive Awareness In Mathematics

Hilmiyah Zakaria[1], Noor Azniza Ishak (Phd)[2]

[1]School of Applied Psychology, Social Work and Policy, University Utara Malaysia, Malaysia
[2]School of Applied Psychology, Social Work and Policy, University Utara Malaysia, Malaysia

Abstract*: The aim of this study was to identify the effect of Reality Therapy Group Counseling (RTGC) and metacognitive levels on student who failed their Mathemathics subject. Metacognitive Awareness Inventory (Schraw and Dennison, 1994) was used to measure students' metacognitive level. The study conducted on 120 Form Four students who failed their Mathematics in their Form Three examination. This study utilized a quasi experimental with pre-test and post-test group design. The treatment group received eight sessions of RTGC with 90 minutes per session in two months while control group did not received any treatment. The results showed treatment group had a higher mean (mean=134.817; SD=31.708) after intervention compare to the control group (mean=116.283; SD=26.175) for metacognitive and all the dimensions in metacognitive (declarative knowledge, procedural knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging and evaluation). These finding shows that RTGC contributed as an important treatment in increasing metacognitive student who failed their Mathematics subject.*
Key words*: Structured Group Counseling Reality Therapy Approach (SCGRTA), Mathematics, Metacognitive Awareness Inventory (MAI), Reality Therapy*

I.   Introduction

Reality Therapy usage in schools can be run in the form of counseling groups in which this method can provide an opportunity for group members to address the same issues with the help of other experts (Ida Hartina Ahmed Tharbe, 2006) in a more productive and innovative (Gladding, 1994) problem solving at school (Wubbolding, 2007). The formation of group will give way to expert group discussions with a more active approach to be taken to help solve problems encountered within the group. This is because the discussion is the representative of the real world. The atmosphere will encourage members of the minority groups to explore issues in greater depth and encourage personal development expert group.

According to the theory of reality, each individual has control over their own behavior and is responsible for the choice he made (Walter, Lambie, & Ngazimbi, 2008). Choice theory explaining human behavior (Wubbolding & Brickell, 2007) which is why an individual do something and what motivates human behavior. Based on the principles of Choice Theory, human behavior generates to satisfy basic needs, meet the needs and bridge the gap between what they want and what they think they will get from the outside world (Glasser, 1988).

Based on Choice Theory and Reality Therapy, a pupil can be successful in Mathematics if he can motivate himself and regulate behavior in order to work hard and make a choice to succeed. Mathematics is considered to be a difficult subject and students dislike because they are unable to make connections between Mathematics and their life and the future (Toit and Kotze, 2009). Students often assume that Mathematics is difficult, boring and monotonous. Because of this, most students have negative attitudes toward Mathematics. If this attitude continues, it will affect the achievement of Mathematics (Effendi Zakaria and Abd Razak Habib, 2006). Attitude plays an important role to the students because of the failure and success of the subject often relates to students with their attitudes.

Metacognitive means 'thinking about thinking' (Flavell, 1979). Thinking refers to the cognitive process used to monitor and regulate the process of self-learning, problems solving and making reasonings. Metacognitive also means 'cognitive about cognitive'; the second in the cognitive as thinking about thinking, knowledge of knowledge or reflection on action (Papaleontiou-Louca, 2008). According to the Flavell (1981) in Papaleontiou-Louca (2008), this definition was later expanded not only to cognitive but also on cognitive and metacognitive awareness refers to the control of an individual who is not limited only to the cognitive process involving emotional and even motivation. Metacognitive become a term often used in the theory of cognitive development (Jacobs and Paris, 1987) because it is a higher-order thinking which involves active control over the cognitive processes involved in learning.

II.   Research Objectives

The main objective of this study are:
1) To investigate the effect of Reality Therapy Group Counselling (RTGC) between treatment group and control group
2) To investigate the metacognitive level in treatment group (RTGC) after treatment given

III.   Research Questions

Based on the research objectives, the following two research questions was developed:
1) Is there a difference effect in the treatment of structured group counselling reality therapy approach (SGCRTA) of metacognitive
2) What is the metacognitive level of treatment group RTGC after treatment

IV.   Research Methodology

Sample

The research subjects are form four students (age 16), of government school from the state of Kedah, Malaysia. The subjects were chosen based on these criteria (i) failed Mathematics (grade 'E'); (ii) have passed the subject of Malay Language and (iii) passed the subject of Science in their Form Three (age 15) assesment. The criteria of passing Malay Language is established to ensure the research subjects have the ability to read, write and understand the text. The subjects also have to pass Science subject because Mathematics and Sciences are similar in the use of the left brain. In addition, the subject of science is the subject of technology that is important to industrialized countries.

The subjects were selected from 10 schools, five schools for subject treatment and another five schools are for control subjects. The same subjects are involved in the pre-study and post-study. The number of study subjects consist of 120 students, which are 60 students from the treatment group and 60 other students from the control group.

Materials And Design

The research design is quasi-experimental design. This design was chosen because the selection of the subject can not be carried out at random, in addition to the inability of researchers to give full control to the variables that were not investigated extraneous (Noraini Idris, 2013). There are two groups of samples in this study, the first group is treatment group which will receive the treatment of Reality Therapy Group Counselling (RTGC) while the second group was the control group that did not receive any treatment. Treatment group had eight counseling sessions in duration of 90 minutes which include the pre session. Both groups were given a pre-test questionnaire of Metacognitive Awareness Inventory (MAI). After the session, MAI questionnaires were given again to the two groups. Counselors who conduct the counseling session consists of those who have been trained in the program Training of Trainer (ToT) using Reality Therapy approach.

V.   Reality Therapy Group Counselling (RTGC)

Reality Therapy Group Counselling (RTGC) is a structured module developed by author to improve metacognitive level of student. This module based on Reality Therapy pioneered by William Glasser (1925-2013). RTGC was developed as a guide for counselors to help students to improve their potential and improve the academic performance focusing on metacognitive. The group counseling model used was based on (Corey, 2004) which has been adjusted into five stages. The construction of the module used Russell (1974) approach which was modified. The module is suitable for secondary school students who have moderate and low mathematics achievement.   The number of sessions held were eight sessions, including pre-session coincides with the view (Schraw, 1998) as well as previous studies. The proposed time counseling session is about 90 minutes because the time limit is appropriate for secondary school students (Fuller, 2007).   Each session combines the concept of metacognition, Reality Therapy and Mathematical concepts. Summary for each activity for each session is shown in Table 1.

Table 1: Summary of Reality Therapy Group Counselling (RTGC) sessions

Session	Metacognitive activities	Reality Therapy concept	Mathematical concept
Pre	• Inform concent • Recognize the names of counselors and friends in the group • Appointment of next counselling sessions		
1	Communicate their knowledge, skills, and abilities	Ambition is the quality (quality world) for each group members.	The concept of numbers: counting fingers while drawing sketches
2	Build confidence	Love is a basic requirement in Reality Therapy. Lacking / no love will cause imbalance / problems to the individual	Divide the paper into five sections (fragments) and subtract operations.
3	Organizing and planning	Each individual is responsible for the behavior that was selected to establish the successful identity or unsuccessful identity.	The straight line is a line without corner or curve. The combination of straight lines called polygons.
4	Planning, thinking skills	Power and freedom	Pyramid object
5	Planning, monitoring and evaluation	The will, direction, evaluation and planning (WDEP – wants, direction, evaluation, planning) is a matter that must follow to change.	Planning, monitoring and evaluation is important in solving problems of Mathematics.
6	Metacognitive process in solving problems	All plans must be made in parallel with $SAMI^2C^{3.}$ (Simple, attainable, measurable, involve, immediate, control, committed, continous)	Success in Mathematics requires skills that need to be trained. Plus and minus is a basic operation in Mathematics.
7	evaluation	Fun and freedom helps an individual to succeed.	

VI. Results

The results were analyzed using descriptive analysis by discussing and comparing the mean and the standard deviation between the treatment group and the control group RTGC, the level of students' metacognitive awareness of Mathematics. The findings mean of pre-test and post-test are described to see the effect of the treatment that was given to the group RTGC, whether metacognitive level of the students are at the same level, increased or decreased after the intervention is given.

Table 2 shows the difference in score between pre-test and post-test on variables metacognitive among subjects in the control group and RTGC group. There was an increase in mean score in the RTGC group and a decrease in mean scores of control group after treatment sessions given. A difference in RTGC group (F = 11.633; SD = 27.785) showed increased levels of metacognitive awareness after the subjects received the treatment. A difference in the control group (M = -5.300; SD = 27.387) showed a decrease in metacognitive awareness levels when the study subjects did not receive treatment.

Table 2: Mean and Standard Deviation Score Test Pre and Post Test Metacognitive Awareness of Students for RTGC group and control group.

	RTGC Group		Control Group	
Metacognitive	Mean	SD	Mean	SD
Pre-test	123.183	24.630	121.583	30.927
Post-test	134.817	31.708	116.283	26.175
Difference score/SD	11.633	27.785	-5.300	27.387

Table 3 shows the number and the level of the sample before and after the treatment session for RTGC group. According to the table, there is an increased level of 'very high' metacognitive an increase of 13.3% from one subject to study nine subjects. The level of metacognitive level 'high' of 6.7% from 21 subjects to 25 subjects also show an increased research subjects. The level of metacognitive level 'moderate' show a decreasing of 20% from 34 subjects to 22. The number of 'low' metacognitive level is uncahnge of four subjects. In conclusion, students who received treatment RTGC has managed to increase metacognitive level to a higher level.

Table 3: Number of subjects in the pre-test and post-test for Metacognitive level in RTGC group

	RTGC Group				
Metacognitive level	Pre test		Post test		Difference (post – pre)
	(N)	%	(N)	%	
Very high	1	1.7	9	15.0	+13.3
High	21	35.0	25	41.7	+6.7
Moderate	34	56.7	22	36.7	-20.0
Low	4	6.7	4	6.7	0
Total	60	100	60	100	

Table 4 shows the number of subjects and the percentage of subjects according to their level of metacognitive in control group. Based on the information in table 4, the number of subjects at the level of metacognitive 'very high' do not indicate any changes in the number of studied, subjects remained one. For metacognitive level 'high', the number of subjects has declined from 28 to 19, a decrease of 15%. For metacognitive level 'moderate' level, the number of subjects increased from 22 to 33, an increase of 18.3%. As for the level of metacognitive level 'low', the number of study subjects were reduced from nine to seven subjects studied a decrease of 3.3%. Generally, the subjects in the control group faced a decline in the level of metacognition.

Table 4: Number of subjects in the pre-test and post-test for Metacognitive level in control group

Metacognitive level	Control Group				
	Pre test	Post test	Pre test	Post test	Difference (post – pre)
	(N)	%	(N)	%	
Very high	1	1.7	1	1.7	0
High	28	46.7	19	31.7	-15.0
Moderate	22	36.7	33	55.0	+18.3
Low	9	15.0	7	11.7	-3.3
Total	60	100	60	100	

Table 5 shows a differences mean and standard deviation score metacognition and metacognitive dimensions for RTGC and control group. There are changes in the mean of pre-test and post-test in comparing metacognitive and dimensions in metacognitive. The mean scores for metacognitive and all the dimensions for RTGC group has increased.   For the control group, the mean of metacognitive increase applies to all four dimensions of procedural knowledge, conditional knowledge, comprehension monitoring and evaluation while the other dimensions indicate a decrease in the mean scores. This shows that the treatment given to RTGC group has managed to raise the score level metacognitive. Based on the table, there is an increase in the mean of metacognitive and metacognitive dimensions of RTGC treatment group.

Table 5: Differences Mean and Standard Deviation Score Metacognition and Metacognitive dimension for RTGC and control group

	Group				Difference score			
	RTGC		Control		RTGC		Control	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
MTG								
Pre	123.183	24.630	121.583	30.927	+11.633	27.785	-5.300	27.387
Post	134.817	31.708	116.283	26.175				
DK								
Pre	19.555	3.908	18.767	5.774	+1.628	5.000	-0.7667	4.996
Post	21.183	4.732	18.000	4.730				
PK								
Pre	8.350	2.239	8.383	2.457	+7.967	2.365	+6.134	2.652
Post	16.317	1.610	14.517	2.361				
CK								
Pre	11.567	2.965	11.683	6.601	+3.100	3.408	+2.017	6.856
Post	14.667	1.724	13.700	2.360				
P								
Pre	16.883	3.710	16.750	4.729	+1.783	4.801	-1.117	4.854
Post	18.668	5.154	15.633	4.793				
IMS								
Pre	20.917	5.381	21.000	7.241	+2.333	5.706	-1.433	7.388
Post	23.250	6.280	19.567	5.407				
CM								
Pre	15.667	3.639	15.500	4.107	+1.700	4.424	+0.050	3.600
Post	17.367	4.621	15.550	3.985				
D								
Pre	15.400	3.692	15.700	3.310	+8.333	4.319	-1.050	3.824
Post	16.233	3.495	14.650	3.569				
E								
Pre	14.850	3.272	13.800	3.741	+1.083	3.609	+1.000	4.249
Post	15.933	3.948	13.900	3.829				

Keywords:
DK : declarative knowledge
PK :   procedural knowledge
CK :   conditional knowledge

P   : planning
IMS: information management strategies
CM : comprehension monitoring
D   : debugging strategies
E   : evaluation

VII.   Discussion

This experimental study aimed to examine the effect of group counseling of RTGC reality structured approach between the treatment group who received RTGC sessions and the control group that did not receive any treatment against metacognitive students. The results showed that RTGC have a higher mean (mean=134.817) compared to the control group (mean=16.283). In conclution, this study has managed to raise the level of students' metacognitive in RTGC treatment group. The analysis showed that (i) there is a significant difference between the treatment group and the control group of metacognitive (ii) there is a significant difference between the treatment group and the control group for the dimension declarative knowledge, procedural knowledge, conditional knowledge, planning and information management strategies (iii) There is no significant difference between the treatment group and the control group for dimensional comprehension monitoring, debugging and evaluation strategies.

The changes apply to the control group may be due to extraneous factors under control. During the three-month intervention periods, the sample in the control group involved with school programs such as Mathematics workshop, i-think program focuses on how to learn and make notes, group and individual counseling sessions, mentor mentee program, PISA program and study skills workshops. Hawthorne effect which samples in the control group also feels that they also receive treatment such as the treatment groups may also affect the result (Gay and Airasian, 2003)

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