SQ4R Approach To Improve The Ability Of Mathematical Connections And Adversity Quotient Matematik MTs Students

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Abstract

This study is a quasi experiment, which aims to examine the achievement and improvement of mathematical connection ability and Adversity Quotient of Mts students through SQ4R learning as a whole and based on KAM and association among variables. The population in this research is all students of class VIII MTsN 1 Subang. Samples were taken by random class, which are from eight grade obtained two classes, namely VIII D as the experimental class and class VIII A as the control class. Instruments in this study were each set of tests for mathematical connections, and a set of student's adversity quotient scales and a set of student's scale of views on SQ4R learning. The study found that the achievement and improvement of mathematical connection ability of students whose learning using SQ4R learning is better than that of learning using ordinary learning as a whole or reviewed from KAM. And also adversity quotient of students who study using SQ4R is better than the learning using ordinary learning. it was also found an association between the ability of connections and adversity quotient of students in the classroom using SQ4R learning. The student's performance illustration during the SQ4R study shows the student's activity both individually or in cooperate in their group to build new knowledge that must be owned by students, so that improving the ability of mathematical connections as well as the adversity quotient of the student.

Keywords : Mathematical Connection, Adversity Quotient, SQ4R Approach

INTRODUCTIONS

Math lessons have a very important role in education. Mathematics learning in schools should not only be directed at improving student's skills in numeracy skills, but also aimed at improving student's skills in terms of understanding and connections. As Ruseffendi (2006) argues that there are many learners who, after studying mathematics, are unable to understand even the simplest parts, many concepts are misunderstood so that mathematics is regarded as difficult, intricate, and hard.

Understanding the concept is the most important part in learning mathematics as stated Zulkardi (2003) that "the subjects of mathematics emphasize the concept". This means that in learning mathematics, learners should understand the concept of mathematics first in order to solve the problems and able to apply the learning in the real world. The concepts in mathematics are organized systematically, logically, and

hierarchically from the simplest to the most complex. Understanding of mathematical concepts is the basis for learning mathematics meaningfully.

In mathematics contains some capabilities that are expected to be mastered by students, one of which is the ability of mathematical connections. Through the ability of mathematical connections, student's thinking ability towards mathematics is expected to become increasingly widespread. In addition, mathematical connections can also improve student's cognitive abilities such as recall, understand the application of a concept to the environment and so on. Without applying the concept to the student's experience, it will be difficult to remember a given material and to remember too many separate concepts whereas math is rich in principles.

According to Suherman (2008), "The ability of connections in mathematics is the ability to associate concepts / rules of mathematics with one another, with other fields of study, or with applications in real life". Mathematical connections refer to an understanding that requires students to demonstrate the relationship between mathematical topics. While the external relations of mathematics include the relationship between mathematics with other fields of study and with daily life.

Mathematical connection refers to Mathematical understanding, a very important part of mathematics and mathematics education. Understanding is a way of sharing ideas and clarifying mathematical connections. Because through understanding, the most important is the achievement of the goal is that students are able to understand something based on learning experience. This understanding ability is very fundamental, because with the understanding will be able to achieve the knowledge of the procedure. After students understand the ability of understanding and mathematical connections, it is expected to arise in students to have intelligence in the face of learning difficulties (Adversity Quotients)

According to Paul (2000) in his two books entitled "Adversity Quotients" explains what intelligence means to deal with adversity and how to improve the new intelligence. Adversity Quotients is the intelligence of facing difficulties by questioning how much control is perceived to be an event of difficulty (control): who or what is the origin of the difficulty, and how far a person acknowledges the result of the difficulty (origin and ownership); questioning how far difficulties will reach or affect other parts of a person's life (reach) and questioning how long the difficulty lasts and the duration of the cause of adversity will persist (endurance). So Adversity Quotients students are very important in the success of a student's learning.

But in reality based on the experience of teaching MTs students, let alone to master the ability of mathematics such as mastering the ability of understanding and mathematical connections, to cultivate adversity quotient students are difficult to happen. This is indicated by the average score of math students who are less good and still many students never do homework. Students are indifferent to learning math, as if math is a difficult, boring lesson.

Based on the above explanation, to improve the ability of mathematical connection, also to grow the Adversity Quotients owned by MTs students in this research will be applied learning model by using SQ4R approach, this is because SQ4R approach is strongly expected to improve the ability of mathematical connection can also grow Adversity Quotients students.

SQ4R approach is one of the learning model with reading strategy that can develop the students metacognitive by assigning the students to read the study materials

carefully, thoroughly, through six stages of survey, question, read, reflect, recite and review.

SQ4R approach is one of the learning strategies commonly used in learning that provides an opportunity for students to think learning to solve learning problems to apply knowledge of concepts and skills, this method aims to enable students to be active and understand the concept with the ability of each.

The application of the SQ4R learning model has several advantages such as being able to increase student activity in the learning process of mathematics, and assisting students in positioning themselves as active learning subjects in mathematics learning, can also organize the material read in easy-to-understand relation, and can relate facts to one with other facts that can help students in improving the ability of mathematical connections and adversity quotientnya. Based description above, the researchers are interested to examine "SQ4R approach to improve the ability of mathematical connections and adversity quotient MTs students"

RESEARCH METHOD

The method of this research is a quasi-experiment in which the researcher took two classes as research sample. One experiment class and one control class. Before and after the treatment both classes were given a treatment test in parallel which is mathematics connection with the design as follows:

$$O \qquad X \qquad O$$
$$- - - - - - - - - - - - - -$$
$$O \qquad \qquad O$$

(Ruseffendi, 2010: 53)
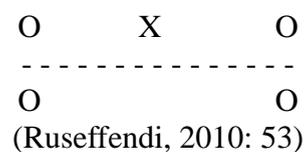
In which:
O   :   pretes = post test of mathematics connection
X   :   learning by using SQ4R approach
- - - - - :   non-random sampling of the subject

The population in this research is all 8th grade students in VIII MTsn 1 subang. The sample is taken from random classes, 2 from 8 classes which are viii D as experiment class and viii A as control class. The instrument in this research is one set of mathematics connection essay test and one set of student's adversity quotient scale test and one set of students view towards SQ4R learning test. Those data are processed through normality test, homogeneity test, and two averages difference, two way anova test, and association test using SPSS software version 21.0 for windows.

RESULTS

The general view of research result for mathematics connection skill and students adversity quotient are as follows:

Tabel 1. Data Analysis of Pretest, Post test, and N-Gain for Achievement and Improvement in Mathematics Connection Skill and Students Adversity Quotient

	KAM		SQ4R Learning				Regular Learning			
			N	Pretes	Postes	n-Gain	N	Pretes	Postes	n-Gain
Mathematical Connection	High	$\bar{x}$	10	14,22	29,5	0,77	10	14,2	26,3	0,61
		s		1,32	0,71	0,02		1,03	1,25	0,04
	Moderat	$\bar{x}$	19	11,47	26,79	0,69	18	11,11	23,11	0,53
		s		1,12	1,68	0,07		0,83	0,83	0,02
	Low	$\bar{x}$	10	7,3	23,5	0,61	11	7,82	19,45	0,45
		s		1,16	1,58	0,04		1,32	1,75	0,03
	Overall	$\bar{x}$	39	10,97	26,64	0,69	39	10,87	22,89	0,53
		s		2,72	2,67	0,09		0,07	2,83	0,07
		L		27,4%	66,6%			27,2%	57,2%	
Adversity Quotient	High	$\bar{x}$	10		93,9		10		88,8	
		s			3,28				2,48	
	Moderat	$\bar{x}$	19		86,84		18		79,78	
		s			1,01				1,83	
	Low	$\bar{x}$	10		68,6		11		60,73	
		s			3,38				5,25	
	Overall	$\bar{x}$	39		83,97		39		76,72	
		s			9,94				11,3	
		L			70%				63,9%	

Ket: Connection SMI =34 ; SMI Adversity = 120 ; x = rerata ; s = Standar Deviasi ; L = % to ideal score ; n = Sampel Amount

The result shows that the average of mathematics connection skill pretest is reviewed overall in SQ4R learning class is higher than the students in regular learning class with the deviation of 0,1, while based on the KAM category, the average of pretest in high KAM category and moderate KAM category in sq4r learning class is higher than the students in regular learning class while the average of pretest in low KAM category in sq4r learning class is lower than the students in regular class.

This shows that the initial mathematics connection skill in experiment class is almost the same as the students in control class. In the post test result of both classes in mathematics connection skill can be seen that the average student's achievement who get sq4r learning is higher than the students who get regular learning, it can be reviewed overall and all KAM categories (high, moderate, low).

The achievement in mathematics connection skill who get sq3r learning in moderate KAM category is higher than the student's achievement who get regular class in high KAM category. This shows that the sq4r learning plays a big role in the student's achievement in mathematics connection skill.

In the normalized gain result can be seen that the n-gain average of students who get sq4r learning is higher than the students who get regular learning, reviewed overall and in all category of KAM (high, moderate, and low) in mathematics connection skill and the n-gain average of students who get sq4r learning in moderate and low KAM category is higher than the students who get regular learning in high KAM category. This shows that the SQ4r learning is very influential in student's mathematics connection skill improvement.

In the result score of student's adversity quotient scale can be seen that the average of adversity quotient of students who get sq4r learning is higher than the students who get regular learning, reviewed overall shown by the average score of 83,97 for the class with sq4r learning and 76,72 for the class with regular learning. Same goes for all KAM category (high, moderate, low) for students who get sq4r learning are higher than the students who get regular learning. In table 1 can be seen that the higher the KAM, the higher the adversity quotient. This shows that KAM influences the achievement of student's mathematics quotient.

Tabel 2. data analysis for post test and N-Gain for Achievement and Improvement In Mathematics Connection Skill and Students Adversity Quotient

KAM	SQ4R Learning		Regulated Learning			
	Normalitas		Normalitas		Uji t /Mann Whitney	
	Postes	Gain	Postes	Gain	Postes	Gain
Overall	0,006	0,019	0,200	0,200	0,000	0,000

The research shows that overall and KAM for both post test and gain the sig score is <0,05 which means that the achievement and improvement of student's mathematics connection skill for students with sq4r learning is better than students with regular learning.

Kruskal wallis test result

Tabel 3. Result Of Kruskal Wallis Posttest And Gain Ability Of Mathematical Connections

KAM	Postes			Gain		
	N	Range	Asymp.Sig	N	Range	Asymp.Sig
High	20	61,68	0,000	20	57,95	0,000
Moderat	37	40,20		37	38,85	
Low	21	17,14		21	23,07	

The kruskal test result shows that in post test and gain the asymp.sig score is <0,05 which means that at least there is one group of students with certain KAM category in which the mathematics learning results are significantly different with other KAM

categories in significance level of 5%. To see the difference between each KAM category, a mann whitney test is conducted with the results as follows:

Tabel 4. Mann Whitney Test Result In Each KAM Category

KAM	Postes		Gain	
	Mann Whitney	Asymp.Sig (1-tailed)	Mann Whitney	Asymp.Sig (1-tailed)
High Moderat	207,000	0,003	167,000	0,0005
High Low	1,500	0,000	44,000	0,000
Moderat Low	21,00	0,000	209,500	0,002

The mann whitney test result shows that there's a significant difference in mathematics connection skill achievement and improvement in high and moderate KAM, in high and low KAM, and in moderate and low KAM.

The research result of the student's adversity quotient is as follows:

Tabel 5. Data Analysis For Student's Adversity Quotient Scale

Pengujian Data	Class	Normalitas	Mann Whitney
Adversity Scale	Eksperimen	0.000	0.000
	Control	0.000	

The result shows that the student's adversity quotient with sq4r learning is better than the students with regular learning.

The result of association is as follows:

Tabel 6. Result Of Chi-Square For Mathematics Connection Skill and Adversity Quotient

	df	Asymp.Sig (2-tailed)
Pearson chi-Square	4	0,000

The result shows sig. $0,000 < 0,05$ which means reject H0, therefore, there is an association between connection skill and adversity quotient of students in MT

DISCUSSION

From the posttest result, it can be seen that there is a significant difference of mathematical connection ability of students who gain learning using SQ4R learning with students who gain ordinary learning either overall or based on KAM level. Based on the posttest result of students' mathematical connection ability, it shows that the mean score of the experimental class students is higher than the control class group either overall or based on KAM. This means that the achievement and improvement of the mathematical connection ability of the experimental class is better than the control class either overall or based on KAM level. Based on the average posttest result also shows that at the low KAM level the average postes score of the experimental class is better than the average postes score at the medium KAM level in the control class and aso nd the mean posttest score at the medium KAM level in the experimental class is better than the postes average score at the high KAM level in the control class. This shows that the learning model using SQ4R approach have a role in improving students' mathematical connection ability.This is in line with research conducted by E Rindiyani (2017) entitled "Improving the Ability of Mathematical Connection and Self Regulated Learning of SMK Students Through SQ4R Learning Model". That concludes that the improvement of mathematical connection ability of students who get the SQ4R learning model is better than the students who get the learning Problem Based Learning.

From result of data processing seen that study of SQ4R influence to adversity quotient mathematic student.

Based on learning method that learning using SQ4R learning can help in developing adversity quotient of student mathematics. This is in line with the pangestika RF research (2017) entitled "The Influence of SQ4R Learning Model on Critical Thinking Skill and Mathematical Adversity quotient of High School Students" shows that the adversity quotient of mathematics students who get learning mathematics through SQ4R learning is better than students who get conventional learning. Based on observations of students' mathematical adversity quotient, whose learning using the SQ4R approach is better than that using ordinary learning. From the test results, there is an association between the ability of mathematical connections, and adversity quotient of mathematical students whose learning using learning model with SQ4R approach.

CONCLUSION

Based on the results of research and discussion previously proposed obtained the conclusion that Achievement and improvement of mathematical connection ability of students whose learning using SQ4R learning is better than those using ordinary learning as a whole or KAM. Mathematics's Adversity Quotient of students whose learning using SQ4R learning is better than those using ordinary learning and there is a high association between the connection and adversity quotient of mathematic students whose learning uses SQ4R learning

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