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Mathematics Connective Skill Reviewed based on *Adversity Quotient* on CORE Learning

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Abstract

This research aims to describe mathematics connective skill reviewed based on adversity quotient of students on CORE learning model of X graders in learning geometry. This concurrent triangulation mixed method used quantitative data technique by mathematics connective skill test and the qualitative data was obtained by documentation, questionnaire, and interview. The subjects were selected by purposive sampling and consisted of 6 students, each of three students were categorized as camper and climber adversity quotients. The findings showed that different AQ categories would have different mathematics connective skills. It was shown by three climber students met 5 indicators of mathematics connective skills. Meanwhile, 3 camper students met three mathematics connective skill indicators.

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INTRODUCTION

The purpose of process and management of education in Indonesia is to foster basis of humans' potential development so they will be knowledgeable, reliable, critical, creative, and innovative humans. It is in line with 2013 curriculum learning which is promoted interactively, inspirationally, challenging, and actively motivate students as well as providing chances for affection, creativity, and independence based on interest, talent, and physical - psychological development of students (Permendikbud No.65, 2013).

According to Regulation of Educational and Cultural Ministry No. 70 Year 2013, core competence to have by learners are understanding, implementing, and analyzing science (Kemendikbud, 2013). According to NCTM and Suhandri (2017) by constructing new knowledge from the prior knowledge needs mathematics connective skill.

Connective skill is a skill to master by students in learning mathematics. It is strengthened by Arina Susanty (2018) stating that mathematics connective skill is needed by students to learn mathematics because by having this skill, students will be able to see that mathematics is a inter-connected topic science and it is useful in learning other lessons within daily lives.

One of material of mathematics which connects to other lesson and in daily lives is trigonometry. Trigonometry is a material to master by students because it is one of discussed material in National Examination and also in higher education selection test. According to BSNP (2018), percentage of internalizing power at national level dealing with trigonometry was 43.46%. Meanwhile the internalizing power at Central Semarang dealing with the material was 47.78%. Al-Azhar 14 Islamic JHS Semarang had the lowest percentage of the material with 39.39%. One of the causes was untrained students' mathematics connective skill s because they tended to memorize the formula and were not directly involved into finding and connecting process of trigonometry comparison concept. It happened because of teacher-centered learning.

Improving mathematics connective skill needs learning model which could involve students actively to train their connectivity power. As stated by Silberman (2009) that learning could not be instilled completely. To remember what was taught, students needed to internalize it. According to Shomad (2014) *connecting, organizing, reflecting,* and *extending* (CORE) model is a learning model emphasizing on students to connect, organize, comprehend, process, and develop information. Therefore, CORE learning model is expected to be successful in improving students' mathematics connective skills.

According to Merianah (2019), students' success in learning depended on how students solved the current problems. In this life, included in educational world, it is a common thing if students have higher intelligence than the others. Intelligence is seen as relative matter because it is different from one to another individual. It is in line with Supardi (2013) that students' successes in learning could be seen from how they solve problems. Each student's solution is different. Therefore, intelligence level of each student is different. Intelligence to solve difficulty in problem is called as *adversity quotient* (AQ). It supports students' successes in improving learning achievements. Lower AQ students tend to consider difficulties as the end of their struggles. They will then surrender and cause their achievements get lower. It is in contrast with higher AQ students.

From interview results with the school's teachers, on trigonometry, the students underwent difficulties in solving trigonometric questions, especially dealing with with daily life problem solving sub-chapter. The teacher's effort to solve those difficulties was done by giving tasks on every meeting. However, the students still considered them difficult and they were surrender. Therefore, they had low scores since they had not efforts to solve the problems properly.

Based on the explanation, it was seen that trigonometry needed to have connection toward problems. To improve mathematics connective skill, there is a need of learning model to make students active with purpose to train their connectivity powers. One of learning models which could develop the skill is CORE model. The syntaxes of CORE model which could improve connective skills is *connecting.* Students would struggle to connect their prior mathematics concepts. It would also train their AQ to

face difficult problems but they would remain struggling to solve it well.

This research aims to find out mathematics learning quality by Connecting, Organizing, Reflecting, Extending (CORE) and describe the students' mathematics connective skills reviewed on adversity quotient.

METHOD

This research is a mixed method. The design was sequential explanatory design. It was done by analyzing and collecting quantitative data which then was followed by analyzing qualitative data. The research was started by preliminary study. Then, it was followed by quantitative data collection, analysis, and qualitative data interpretation. The research was carried out at Al Azhar 14 Islamic SHS, Semarang. The sample consisted of 50 students and the subjects consisted of 6 students. They were taken by purposive sampling. They were three students categorized as camper and three students categorized as climber.

The quantitative data collection was done by mathematics connective skill test. The qualitative data collection techniques were done by interview and documentation. The quantitative data was analyzed by normality, homogeneity, variance average, proportional, and two average equality tests. The qualitative data analysis was done by Miles & Huberman (2007) by reducing, displaying, and concluding the data.

FINDINGS AND DISCUSSION

On the research stage, the outcome of the learning was measured quantitatively by giving mathematics connective skill test. The test was done for two groups: experimental and control groups. The requirement test showed that MCST results were normally and homogeneously distributed. The result of final MCST classical accomplishment could be seen on Table 1.

Table 1. Individual Accomplishment Test

t_{hitung}	t_{tabel}	Criteria	Conclusion
4,52	1,71	$t_{hitung} > t_{tabel}$	H_o denied

Based on the analysis on table 1, the individual average accomplishment was obtained $t_{hitung} = 4{,}52$ higher than $t_{tabel} = 1{,}71$. It shows that mathematics problem solving skill of the students were higher than actual passing grade (BLA = 65).

The result of final MCST classical accomplishment could be seen on Table 2.

Table 2. Classical Accomplishment Test

Z_{hitung}	Z_{tabel}	Criteria	Conclusion
1,96	1,65	$Z_{hitung} > Z_{tabel}$	H_o denied

Based on the analysis on table 2, the classical average accomplishment was obtained $z =$ 1,96higher than $z_{tabel} = 1{,}65$. Therefore, it is $z > z_{tabel}$so the proportion of accomplished students was higher than 75%.

The result of final MCST variance average could be seen on Table 3.

Table 3. Average Comparison Test

Groups	t_{hitung}	t_{tabel}	Criteria	Conclusion
Experimental	1,81	1,68	$t_{hitung} > t_{tabel}$	H_o accepted
Control				

Based on the analysis of average difference test on table 3, it show that $t = 1{,}81$ and $t_{tabel} = 1{,}68$. Therefore, it is $t > t_{tabel}$ so the average score of mathematics connective skill by using CORE model was higher than those taught by PBL. Carefulness is needed in answering final answer/writing the conclusion correctly. It is iin line with Arfiana & Wijaya (2018) that students committed mistakes during calculating, exactly when promoting problem solving strategy. Problem solving in mathematics could be implemented on mathematics connection in developing science about mathematics concept and procedure. (Erna Kuneni: 2017)

Categorization result of Adversity Response Profile (ARP) of the students was grouped into camper and climber. From ARP, it consisted of 25 experimental group students with 21 camper and 4

climber categories. Table 1 shows categorization list of students reviewed by adversity quotient.

Table 4. Student Categorization Reviewed based on *Adversity Quotient*

Criteria	Numbers of the Students	Percentage
Climber	4	16
Camper	21	84
Quitter	0	0
Total	25	100

Table 4 shows that 4 student with *climber* typed adversity quotients had high mathematics connective skill. Students with moderate *camper* typed *adversity quotient* consisted 21 persons with moderate mathematics connective skill. According to Intan Rukmana (2016), students' *AQ* will influence mathematics learning outcomes because in learning mathematics students are required to solve mathematics problems which are connected to daily lives. If students have high *AQ* in learning, especially in learning mathematics, they will have much struggles since they have high learning motivation. This will bring students to satisfied and better learning outcomes or achievements.

Mathematics connection could make students having opened thought and insight toward mathematics and they will not only focus on one lesson topic but instead they could connected to other topics (Ni'mah: 2017). Mathematics connective skill also describes skill to connect a topic to another topic in mathematics and other daily lives which have important roles in learning process,e specially learning mathematics (Ayu Sri Puspita Devi: 2019)

Mathematics connection is mathematics skill aspect to develop for students. It is also written in 2013 curriculum mathematics learning purpose (Depdikbud, 2014: 345-346), it is "mathematics learning purpose is to allow students understand mathematics concept, explain the connection among concepts, and apply concepts of algorithm reliably, accurately, efficiently, and appropriately in solving problems" (Romli: 2016). According to Nuriana Rachmani Dewi (2018), mathematics connective skill is important to master by students since they must be able to connect mathematics concepts both inter-connected inside of mathematics and inter-connected outside of mathematics.

The analysis of answer and interview toward *camper* typed adversity quotient students showed that they could describe mathematics problems and connect it to mathematics basic concepts. They could use and connect various mathematics principle to solve problems. They could not use a mathematics principle connection to the other dealing with new principle or formula to solve problems. After being interviewed, the camper subjects were given challenge by researcher to determine new formula by connecting it to other principle. Camper subject tried the challenges but they were confused in connecting it to new formula. Generally, camper subjects found connectivity among mathematics principle one to another principle to solve problems. It is in line with Rosita & Rochmad (2016) that camper students were on comfortable zone and feeling satisfied while they had reached certain target but it was not maximum. It is also in line with Darojat (2016) that camper students could find the known and asked information from the questions, plan problem solving accurately.

Climber subjects master four aspects. They were describing mathematics problem, connecting to mathematics basic concept, being able to use and connect various mathematics principle to solve problems, and being able to use the mathematics principle relationship one to the other into new principle or formula which are needed to solve problems. After being interviewed, the climber subjects were given challenge by the researcher to find new formula by connecting it to other principles. Climber tried the challenges but they were confused in connecting it to new formula. It is in line with Stoltz (2000) that climber students faced the problems properly and motivated positive changes. Climber subjects would directly ask when they had difficulties and wanted to try various ways in solving problems and finding out new ideas to connect various mathematics principles. It is in line with Rosita & Rochmad (2016) that climber liked challenges and they were not easily surrender to face challenges.

CONCLUSION

It could be concluded that *Connecting, Organizing, Reflecting,* and *Extending* learning was

qualified and able to improve mathematics connective skill of the students. The students' mathematics connective skill reviewed based on *adversity quotient* showed that different AQ students would have different mathematics connective skills.

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