

Improving Self-Confidence Through an Active Knowledge Sharing Model in Primary Schools

Nurdin Kamil

Primary Education Department
Graduate School, Yogyakarta State University
Yogyakarta, Indonesia
nurdinkamil43@gmail.com

Jailani

Mathematics Education Departement
Graduate School, Yogyakarta State University
Yogyakarta, Indonesia
jailani@uny.ac.id

Abstract— This study aimed to describe the effect of the Active Knowledge Sharing model and scientific approach on the self-confidence of fourth-grade students in primary schools. It was quasi-experimental research with a nonequivalent control group pretest-posttest design. This study used two experiment groups (Active Knowledge Sharing Model) and two control groups (ordinary learning). The population in this study consisted of the experiment group (State Primary School SDN Balangan 1 and SDN Sendangharjo) and the control group (State Primary School SDN Balangan 2 and SDN Kebonagung). The researchers collected the data using non-test instruments in the form of a questionnaire to measure the students' self-confidence level. The data normality was tested using *Kolmogorov-Smirnov*, and the homogeneity was checked by applying *Box's M*. The data was analyzed using an independent sample t-test. The result shows that the significance value (*sig.*) of the dependent variable (self-confidence) is less than 0.05 ($0.008 < 0.05$). It means that H_0 is rejected and H_a is accepted, implying that there is a difference in the student's self-confidence between the experiment classes and the control class.

Keywords—*knowledge-sharing, self-confidence, primary school*

I. INTRODUCTION

Education is the most essential thing in human life. The aspect achieved in it is the human capital in running their lives, and learning produces a pattern of changes that improve the lives and ordinariness of human life. The changes in question are the improvement of behavior and perspective in addressing the problems of learning outcomes, without any coercion and experience perceived. Mathematics teaching in the classroom should pay attention to all students who are able to get actively involved in learning. Mathematics learning for some students is considered difficult because they must be able to do many complex calculations. Of course, this is also influenced by the students' less self-confidence toward abilities in learning.

The students' low self-confidence and independence are caused by many factors. One of

them is that many students are not interested in mathematics because it is considered difficult and boring. In addition, the students' less involvement in learning can be due to the conventional learning strategies applied by many teachers [1]. For that, this article specifically discusses self-confidence in learning mathematics. Confidence is a trait capable of changing views about oneself on it is a belief to do an action as personal characteristics comprising self-ability, optimism, objectivity, responsibility, rationality, and realism [2]. Hence, self-confidence is assumed to be able to change the students' belief to actively participate in learning mathematics, to see the adequate ability in self, and to develop the existing capacity. Based on the opinions above, students having high self-confidence in learning mathematics are skillful in generating ideas and actively asking or answering questions.

Low self-confidence can be identified in some children's fears in answering questions given by teachers, anxiety, and confusion during teaching and learning [3]. Self-confidence in one's abilities generally raises motivation, making it a valuable asset for individuals with imperfect determination [4]. Mathematics learning through a scientific approach is a process designed in such a way that learners actively construct concepts, laws or principles through stages such as "observing (to identify or find problems), formulating problems, formulating hypotheses, collecting data using various techniques, analyzing data, drawing conclusions, and communicating concepts, laws, or principles that are "discovered" [5]. In such activities, self-confidence must be possessed by every student in supporting the active learning of mathematics. In some schools, self-confidence becomes a certain issue; this is because some students who feel incapable in Mathematics will lose self-confidence when the answers they provide are not correct.

The current Mathematics education reform focuses on the development of the "mathematical power" of each child [6] (NCTM, 1989 of character); mathematical power can be developed in very young children [7] (Phillips & Anderson 1993; Mueller and

Lourdes, 2005). From one of the observations conducted in Surakarta, the results of the students' low self-esteem are: 1) there are 2 students (6.67%) who dare to express their opinion, 2) as many as 4 students (13.33%) want to ask if they do not understand the material, and 3) as many as 10 students (33.33%) dare to solve problems in front of the class [1]. Next, look at the factors that affect the students' low self-confidence. The students' low self-confidence is caused by many things. One of them is that the student's interest in learning Mathematics is low because the students assume that it is difficult and boring. In addition, less involvement of students in the learning process is due to a condition where many teachers still use conventional learning strategies.

Furthermore, an observation conducted in Kramat Jati reveals a phenomenon of students who perform in front of the class. They look less intelligent, easily nervous, anxious, and excited, especially when instructed by the teacher to do the task in front of the class and seen by his friends. Before coming forward, the learners are getting restless; the prior concentration disappears; the situation changes; the tension covers the learners' feelings [3]. Therefore self-confidence that requires a person to manage the deficiencies and strengths existing in a personality cannot be shown [6]. Belief in a person's ability generally increases motivation, making it a valuable asset for the individual with imperfect determination [7]. Also, parenting can be any interaction between a parent and a child [8]. Effective communication, cooperation, and the ability to give each other in teaching can improve students' self-confidence, as found in learning through an active knowledge sharing model.

In contrast to conventional models, learning using the active knowledge sharing model emphasizes active and student-centered mathematics learning. Hence, every problem that happens to students can be solved by discussing with a friend who understands the purpose of mathematical problems. This model can be applied to cooperative learning conditions to solve the problems given by each group. This model has a syntax tailored to the phases of each learning activity, i.e., teacher explanation method, question and answer, group formation, and group discussion. In addition, the students spread to the whole class to ask problems that have not been solved and then returning to their group. The Active Knowledge Sharing model has several advantages: the collaboration involves students not only mentally but also physically, and the model provides a social impact. [9] Ideal knowledge sharing situations require the ability to accept all relevant information directly easily [10]. The process of meeting, discussion, or forum should be well planned first. [11]

II. LITERATURE REVIEW

A. Active Knowledge Sharing Model

Active learning is a process aiming to encourage students to learn by using various ways/models actively. Active learning aims to optimize all potentials possessed by students so that all of them

can achieve satisfactory learning achievements in accordance with their characteristics and keep the students' attention to stay focused on the learning process. Knowledge sharing can also be interpreted as an exchange of thoughts or new information. It has also been defined as providing one's knowledge to others and receiving information from other people [12]. The active activity in transferring and receiving information is done by several people.

Active knowledge sharing activities are implemented by several people; in this case, it can be considered as a group. Reciprocal activities provide information in which everyone gets involved. In addition, knowledge sharing is perceived as a process used in equalizing a thought and finding a way out of a problem. According to [13], knowledge sharing is the process by which individuals collectively and creatively refine a thought, idea, or suggestion in experiences. It is also one model that can allow students to learn materials quickly.

Knowledge sharing has been defined as providing one's knowledge to others and receiving it from others. A more pragmatic description of knowledge sharing is "the process through which one unit is affected by the experience of another". The knowledge sharing process is also defined as an exchange of knowledge between at least two parties in a reciprocal process allowing reshaping and sense-making of knowledge in the new context. According to the opinion, it is a process of transferring one's knowledge to others influenced by the experience possessed by both the giver or/and the recipient of the knowledge transfer. Furthermore, the exchange of knowledge is also defined as a process of transferring knowledge between at least two people through a reciprocal process.

The findings of the research by [14] show that active knowledge sharing can improve the students' critical thinking skills and motivation. It also helps students discuss the mathematics problem, creates student-centered learning, and improves the positive effects (remembering, understanding, applying, analyzing, and creating). It is in line with the scientific approach of 2013 Curriculum. Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity [15]. The scientific method is a simple three-step process. It is begun by carefully observing some parts of nature. If something that appears is not well understood, the students speculate the explanation and then find some ways to test those speculations [16]. In addition, according to Jarman and Carey, a scientific approach has steps in learning.

B. Self-Confidence in Mathematics

Self-confidence encourages yourself to take action and understand the practical steps that must be considered. It is a belief in an individual to understand every advantage that is in him/her and help him/her in

achieving all his/her life goals (Hakim. 2004: 6). Self-confidence has risen from the aspect of belief in the abilities a person has, believing that every experience, event, the achievement of a person will support him/her to reach life goals. According to Lauster (2002: 4) self-confidence is an attitude or belief in one's abilities so that the person is not too anxious, feels free to do things that are in accordance with the wishes and responsibilities for his/her actions, politely interacts with others, has an encouragement of achievements, and can recognize the strengths and weaknesses. According to Lauster, the people with an attitude reflecting self-confidence always care of others, have a high tolerance, can encourage themselves, are confident and optimistic on their abilities, and do something willingly and happily.

Based on the opinions of some experts above, a person's attitude that believes in the ability and strength acts in accordance with what he/she wants as a feeling of confidence in his/her actions. The person is able to take into account everything done, optimistic and happy in solving everyday life problems.

III. RESEARCH METHODOLOGY

A. Participants

It is quasi-experimental research using a quantitative approach. This study applied a non-equivalent control group design. It was carried out in the even semester, in the 2017/2018 school year, from April 23, 2017, to May 17, 2017. The population in this study was all fourth-grade students of a State Primary School in Minggir District, Sleman Regency. To determine the sample, the researchers employed a simple random sampling technique.

B. Data Collection

The data collection was carried out using a non-test instrument in the form of a questionnaire to measure the students' self-confidence in learning Mathematics given at the pretest and post-test.

The hypotheses used in the research are presented as follows:

Ho: $\mu A2 = \mu K2$; there is no difference in the students' self-confidence between the experiment classes and control class.

Ha: $\mu A2 \neq \mu K2$; there is a difference in the students' self-confidence between the experiment classes and control class.

The $\mu A1$ shows the mean of the students' confidence in the experiment class, which uses the Active Knowledge Sharing model. The mean of $\mu K1$ expresses the students' self-confidence in the control class uses direct instruction. The hypothesis testing begins with the univariate mean difference test using an independent sample t-test. This test is conducted to see the effect of the Active Knowledge Sharing model and a scientific approach on the students' self-confidence. The hypothesis testing is completed using SPSS 25.0 for windows.

IV. RESULTS AND DISCUSSION

A. Results

1) Data Description

Based on the observation, the mean of the learning implementation in terms of the teacher's activities was 98.48%, while the mean of the learning implementation seen from the students' activities was 96.21%. The data is the result of the students' self-assessment; the pretest is given before the treatment, and the posttest is administered after it. The description of the students' self-confidence data before and after the treatment is presented in the table below.

TABLE I. DESCRIPTION OF PRETEST-POSTTEST RESULTS ON SELF-CONFIDENCE

Description	Experiment Class		Control Class	
	Before	After	Before	After
Mean	19.41	23.80	20.77	21.11
Std. Deviation	2.695	2.277	2.605	2.093
Highest Score	22	25	23	24
Lowest Score	13	18	14	15
N	54	54	57	57

Based on the data in the table above, the mean of the questionnaire data on self-confidence in the experiment class with the initial ability before being treated is 19.41, while the mean in the control class is 20.77. The lowest score of the experiment class before treatment is 13, while that of the control class is 14. The highest score in the experiment class before the treatment is 22 and 23 in the control class. From the previous description, there are many students in both the experiment and control classes who have not passed the minimum grade. The difference in the mean increase based on the pre-test and post-test of the experiment and control classes can be seen in Table 2 below.

TABLE II. THE DIFFERENCE OF INCREASE IN AVERAGE SCORE OF THE PRETEST AND POSTTEST RESULTS

Variable	Increase in Mean Score	
	Experiment Class	Control Class
Self-Confidence	4.39	0.34

Based on the table above, the increase in mean of the experiment class using the Active Knowledge Sharing model with the scientific approach is 4.39, while in the mean increase of the control class is 0.34. It can be seen that the improvements in the experiment and control classes are different.

2) Data Assumption Test

a) Normality Test

The data normality is tested to find out whether the study population is normally distributed or not. It is tested using Kolmogorov-Smirnov which is processed by SPSS 25.0 for Windows software. The population is normally distributed if the level of significance is higher than 0.05 or $\alpha = 5\%$. The results

of the normality test before the treatment can be seen in the following table.

TABLE III. NORMALITY TEST RESULTS ON SELF-CONFIDENCE

Variable	Class	Sig. Value - Kolmogorov-Smirnov	Description
Pretest	Experiment	0.75	Normally distributed
	Control	0.067	Normally distributed
Posttest	Experiment	0.082	Normally distributed
	Control	0.158	Normally distributed

The significance value of the experiment and the control classes is higher than α ($\alpha > 0.05$). It means that H_0 is accepted. It can be concluded that the data on the pretest of both experiment and control classes is normally distributed.

b) Homogeneity Test

The homogeneity test aims to examine the similarity of the covariance matrix of the dependent variables simultaneously (multivariate). This homogeneity test uses Box's M with SPSS 25.0 for windows. The data is claimed homogeneous if it has a significance value, which is higher than 0.05. Meanwhile, if the significance value is lower than 0.05, the variant-covariance matrix of the population is considered homogeneous. The homogeneity test results before the treatment can be seen in the table below.

TABLE IV. HOMOGENEITY TEST RESULTS WITH BOX'S M

Variable	Box's M	F	df.1	df.2	Sig.	Decision
Pretest	3.195	1.044	3	23632	0.372	H_0 Accepted
Posttest	11.011	1.057	10	56414	0.392	H_0 Accepted

The results of calculations using SPSS 25.0 for windows in the table above obtained the significance of the data before the treatment that is $0.372 > 0.05$. From these results, it can be concluded that the variance-covariance matrix of both populations is the same or homogeneous. Then, based on the calculation results using SPSS 25.0 for windows on the posttest data, it shows the result of 0.392, which is higher than 0.05. It can be concluded that the variance-covariance matrix of both populations is the same or homogeneous.

c) T-test

The result of the calculation using SPSS 25.0 for windows is presented in the table below.

TABLE V. RESULT OF INDEPENDENT SAMPLE T-TEST

Variable	t	Significance	Decision
Confidence	2.712	0.008	H_0 is rejected

Based on the table, the significance value of the dependent variable (0.008) is lower than 0.05. It

shows that H_0 is rejected and H_a is accepted, and the conclusion is that there is a difference in the self-confidence between the experiment and the control classes.

B. Discussion

The next discussion is the effect of the Active Knowledge Sharing model and the scientific approach on the students' self-confidence. The data on the students' self-confidence is obtained from non-test instruments in the form of self-confidence questionnaires filled by the students in the experiment and control classes. The survey of students' self-confidence is conducted before and after the treatment to determine the effect of the Active Knowledge Sharing model and scientific approach on the students' self-confidence. The result of the pre-test shows that the highest value for the experiment class is 25, and the lowest value is 23. In the control class, the highest score is 25, and the lowest one is 14. After the treatment is given, the experiment and control classes have the same highest score of 25 and the lowest one of the experiment class is 16. This can be seen that the Active Knowledge Sharing model with the scientific approach is influential but not significant to the students' self-confidence.

The learning is implemented according to the Active Knowledge Sharing model and the scientific approach which requires the students to participate in the learning process actively. This is done to encourage students to be more confident and actively participate in learning. In line the opinion by [19], motivation rises in the aspect of self-confidence that is inherent, so that it seems, partially, to be an expression of motivation. It helps explain why higher self-confidence, when considered specifically, can relate to the next higher achievement. At the beginning of learning in the experiment class, there are still many students who feel embarrassed when asked to express their opinions and to join the discussion. The students are given a module for the material used in the discussion. For this reason, a homogeneous group is formed and divided according to the number of students.

However, in this model, there is a stage where each student should dare to ask questions and discuss with each other. In developing self-confidence, one should have experience and a variety of relationships, such as close and intimate relationships, and broader relationships [20]. According to [21], giving a way to solve math problems in different ways will also develop students' creativity and self-confidence in answering the questions. Working in groups, automatically students have been trained to discuss and exchange information so that students' self-confidence will improve. After that, the steps of students to discuss with different groups also increase their experience in fostering self-confidence in learning mathematics. It is in line with the opinion of [22] in conveying the knowledge that exists in a person. The students can express their knowledge as an expression of self-confidence in learning. In

learning using an Active Knowledge Sharing model and a scientific approach, students have begun to dare to express opinions, both in group discussions and in presenting the results of the conclusions drawn. The ability applied in this model is done by communicating or speaking to convey information [23]. Hence, it is very demanding for students to dare to speak. The scientific principles of the method play a significant role in the scientists' realism argument and in the position of rivals. Realist scientists not only maintain that the purpose of science is the truth but also seek knowledge and even provide a level of certainty on observable and unobservable dimensions of reality.

Student worksheets are given after the teacher explains the learning material so that students have a basic understanding of the problems that must be resolved. Students do not have to thoroughly discuss because in giving answers, each child writes according to his/her duties and abilities. Of course, this does not influence the improvement of self-confidence in conveying students' arguments. Based on a study on the learning implementation using an Active Knowledge Sharing model conducted by [24], the average result obtained by the experiment class is 77, while the control class has an average of 67. In brief, the mean of the experiment class is higher than that of the control class.

Students' motivation is also very helpful in improving self-confidence. The teacher motivates the students to be more enthusiastic in learning at school and home. As stated by [25], the interpretation of a physiological status is another area where teachers can develop the students' self-efficacy. Helping students to control anxiety and fear related to science or certain subjects is needed. That harmful passion is not congruent with student performance can facilitate the development of positive self-efficacy, which in turn, will lead to more positive physiological conditions. Based on the results of the discussion above, the Active Knowledge Sharing model with a scientific approach has a positive effect on the students' self-confidence.

V. CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded as follows. There is a positive and significant effect on the students' self-confidence in learning Math using the Active Knowledge Sharing model. Based on the result of the Independent Sample t-test above, the significance value of the dependent variable is obtained ($0.008 < 0.05$). It means that H_0 is rejected and H_a is accepted, and the conclusion is that there is a difference in the students' self-confidence between the experiment and control classes.

ACKNOWLEDGMENT

The researchers thank participants who were cooperative in filling the questionnaire and collaborative during the data collection process.

REFERENCES

- [1] Yuni, T.W., "enhancement of self-confidence and students 'construction in learning math". Thesis. Universitas Muhammadiyah Surakarta, Surakarta, 2014.
- [2] Ghufro, M Nur and Rini Risnawita S., "Teori-teori Psikologi", Ar-Ruzz Media, Yogyakarta, 2011.
- [3] Sapitri, Diah, "a confidence relationship with mathematics learning achievement", UIN Syarif Hidayatullah, Jakarta, 2015.
- [4] Benabou, Roland and Jean Trole, "self –confidence and personal motivation" journal of Economics 1 (3), 871-915 (2002)
- [5] Kemendikbud 2013 <http://www.kemdikbud.go.id/> Retrieved 03 Mei 2018
- [6] National Council of Teachers of Mathematics <http://www.fayar.net/east/teacher.web/math/standards/previous/CurrEvStds/evals4.htm> Retrieved 03 Mei 2018
- [7] Phillips E. & Ann Anderson. (1993). Article. "Developing mathematical power: A case study". Journal of Early Development and Care 96 (1), 135- 146. (1993)
- [8] Ruwaida, A, Salmah Lilik and Rosana Dewi "Hubungan antara kepercayaan diri dan dukungan keluarga" Jurnal Indigenous 8 (2), 76-79 (2006)
- [9] Dewi, A. N., Dwiastuti, S., & Prayitno, B. A. "Pengaruh penggunaan model active knowledge sharing terhadap hasil belajar ditinjau dari minat belajar siswa SMA". Thesis. 2006
- [10] Gulev, R. E. "Knowledge Sharing Across Cultures". Koper: the Slovenian Book Agency. 2009.
- [11] King, W. R. "Knowledge Sharing. Encyclopedia of Knowledge management, 492–498. (2006)
- [12] Pulin, D., & Suneson, K. (2012). Knowledge Transfer, Knowledge Sharing and Knowledge Barriers – Three Blurry Terms in KM. Electronic Journal of Knowledge Management, 10(1), 81–91. <https://doi.org/10.1108/14684520910951186>
- [13] Chua, A. (2003). Knowledge sharing: a game people play. Aslib Proceedings, 55(3), 117–129. <https://doi.org/10.1108/00012530310472615>
- [14] Huang, M.-Y., Tu, H.-Y., Wang, W.-Y., Chen, J.-F., Yu, Y.-T., & Chou, C.-C. (2017). Effects of cooperative learning and concept mapping intervention on critical thinking and basketball skills in elementary school. Thinking Skills and Creativity, 23(101), 207–216. <https://doi.org/10.1016/j.tsc.2017.01.002>
- [15] Jarman, R., & McClune, B. (2007). Developing scientific literacy. Remedial and Special Education. Two Penn Plaza, NY: Open University Press. <https://doi.org/10.1080/09500690801908348>
- [16] Carey, S. S. (2011). A beginner's guide to scientific method. Learning.
- [17] Hakim, Thursan. (2002). Mengatasi Rasa Tidak Percaya Diri. Jakarta. Puspa Swara.
- [18] Lauster, P. (2002). Tes Kepribadian. Jakarta. Gaya Media Pratama.
- [19] Sheldrake, R. (2016). Confidence as motivational expressions of interest, utility, and other influences: Exploring under-confidence and over-confidence in science students at secondary school. International Journal of Educational Research, 76, 50–65.
- [20] Lindenfield, G. (1997). Educate children to be confident. London: Harper Collins Publisher
- [21] Sophia, H. F. (2016). Kepercayaan Diri Mahasiswa PGSD Universitas Muhammadiyah Tangerang Pada Mata Kuliah

- Konsep Dasar Matematika. *Jurnal Pendidikan Sekolah Dasar (JPSD)*, 2(2), 117–124.
- [22] Nola, R., & Sankey, H. (2010). *Theories of scientific method: An introduction*. Swansea: Imprimatur.
- [23] Aalst, Van J.. (2009). Distinguishing knowledge-sharing, knowledge-construction, and knowledge-creation discourses. *International Journal of Computer-Supported Collaborative Learning*, 4(3), 259–287.
- [24] Hendrizal. (2015). Penerapan model active knowledge sharing pada pembelajaran matematika. *Jurnal Pelangi*, 7, (2).
- [25] Britner, S. L., & Pajares, F. (2006). Sources of Science Self-Efficacy Beliefs of Middle School Students. *Journal Of Research In Science Teaching*, 43(5), 485–499. <https://doi.org/10.1002/tea.20131>