International Journal of Instruction *July 2022 ● Vol.15, No.3*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 451-464

Article submission code: 20211108103454
Received: 08/11/2021 Revision: 16/02/2022
Accepted: 10/03/2022 OnlineFirst: 01/05/2022

Improving Students' Collaboration Thinking Skill Under the Implementation of the Quantum Teaching Model

Syamsu Nahar
Universitas Islam Negeri (UIN) Sumatera Utara, Indonesia, *syamsunahar@uinsu.ac.id*

Suhendri
Dharmawangsa University, Indonesia, *suhendri165@dharmawangsa.ac.id*

Zailani
Muhammadiyah University, North Sumatera, Indonesia, *zailani@umsu.ac.id*

Hardivizon
Institut Agama Islam Negeri (IAIN) Curup, Indonesia, *hardivizon@iaincurup.ac.id*

Students' collaborative thinking skills in the elementary schools still need attention to be improved. Most elementary school students have difficulty in cultivating this skill. Even though, this skill is one of the 21st century skills, namely 4C (creative thinking skill, critical thinking skill, communication skill and collaborative thinking skill). This study aims to improve the students collaboration thinking skills under the implementation of a cooperative learning type, namely a quantum teaching model. This research was conducted by using quasi experiment in the form of non-equivalent (pre-test and post-test) control group design. The sample in this study were students of the Integrated Islamic Elementary School, Al-Musabbihin, Medan City, totaling 55 students. To test the difference of the students' collaborative thinking skills in the control class and experiment class under the implementation of quantum teaching model, we used statistics analysis tools, namely homogeneity test and independent sample *t-test*. The results of Levene Statistic for homogeneity test showed a significance value of 0.762 > 0.05, which means the two classes are homogeneous. The independent sample *t*-test showed that the score is 0.007 < 0.05, which implies the difference between the two classes is significant. It concludes that the implementation of quantum teaching model can improve the students' collaboration thinking skills in Islamic Religious Education Learning. Therefore, increasing the teachers skills in developing quantum teaching learning materials needs to be improved simultaneously through government policy programs or independently through deliberation activities for teachers of Islamic religious education subjects.

Keywords: quantum teaching model, Islamic religious education learning, collaboration thinking skills, learning, thinking skills

Citation: Nahar, S., Suhendri., Zailani., & Hardivizon. (2022). Improving students' collaboration thinking skill under the implementation of the quantum teaching model. *International Journal of Instruction*, *15*(3), 451-464. https://doi.org/10.29333/iji.2022.15325a

INTRODUCTION

The most crucial problems of the quality of education at this time are the problems of the low quality of the learning process, the low interest in learning, and the learning outcomes of students especially collaboration thinking skills. Sanjaya argues that the evidence for the low quality of learning is teacher-centered learning so that students are not encouraged to develop collaboration thinking skills (Sanjaya, 2020). The weak collaboration skills of students at school are marked by the low ability of students to carry out group learning and low mutual respect for differences of opinion. Students have closed mind and do not accommodate with each others. Students do not want to share roles and responsibilities in working on educational projects together. Low motivation and enthusiasm in doing assignments and very poor in giving appreciation for the achievements of peers (Harackiewicz et al., 2017).

This kind of condition results not only in the inability of students to understand the teaching material and master it, but also makes students unable to connect the material being studied with real life. Whereas on the contrary, if the teacher can accompany students to associate the material being studied with the reality of life, it will make students have high motivation. We need to ensure the students have skills to learn and innovate, skills to use technology, (Keller, 2016). We need also to ensure the students can survive by using their life skills obtained from their learning process (Bancin & Ambarita, 2020).

Moreover, In Indonesia, Islamic religious education is one of the compulsory subjects taught in schools. As a subject, Islamic religious education subjects also consist of four main elements, namely: facts, principles, concepts, and procedures. The four main elements must be packaged in such a way by the teacher so that students achieve the expected learning objectives. In addition, it is hoped that the learning process of Islamic religious education can also prepare a generation to face 21st-century era, as well as to motivate the students to achieve 4C skills, including collaboration skill (Prihadi, E., et al., 2021).

In other words, learning Islamic religious education is very possible to facilitate the realization of students who have collaboration skills. For this reason, what is needed is the ability of teachers to apply Islamic religious education learning models that will ensure the formation of student collaboration skills. The learning model, which can be chosen, is a quantum teaching model.

The quantum teaching model is a combination of various interactions in learning activities. Quantum teaching model are models focusing on the learning process that gives learners a freedom, namely a freedom to learn, a freedom to interact, a freedom to communicate and freedom to access learning source. This will improve the students collaboration thinking skills and thus it will improve the student learning outcomes, creative innovative, and critical thinking skill and interaction among the students (Deporter, et al., 2000) (Cahyaningrum et al., 2019).

In the learning process, the teacher is a very important figure, since the teacher is the spearhead of learning who interacts directly with students as learning subjects. The

ability of teachers to manage learning in the classroom will have a big impact on the abilities of students. Conversely, a decrease in the ability and achievement of student learning outcomes is an indicator that the teachers have low ability to manage the classroom (Ginja & Chen, 2020).

The Quantum teaching model is very important for teachers to pay attention in accelerating the development of students' abilities to adapt and live according to 21st century era. This model inline with the UNESCO education pillars, namely learning to know, learning to do, learning to be, and learning to live together. On the other hand, the quantum teaching model will present students to be critical, collaborative, communicative, and creative.

In Indonesia, Islamic religious education is one of the compulsory subjects in elementary schools. However, in the learning process of Islamic religious education, students are only taught to learn it and memorize the concepts or theories. Whilst, the essence of Islamic religious education as a process, attitude, and application is not touched in the learning process. As a result, students have the view that Islamic religious education is the knowledge that is not contextual and meaningful. Finally, this view causes the low interest of students as well as the low learning outcomes of students in studying Islamic religious education.

Based on the description above, one of the strategies that can improve leraning outcomes of Islamic education learning is implementing the quantum teaching model. Previous research has explained that quantum learning strategies can improve students' cognitive and metacognitive learning outcomes (Arini et al., 2017), increase interest in learning and mastery of concepts (Anggoro et al., 2018), increase in critical thinking skills of students (Ramadhani & Ayriza, 2019) (Chusni, M. M., Saputro, S., Suranto., & Rahardjo, 2021), and motivation to learn students (Rodiyana, 2018). Unlike previous studies, in this study, we will investigate the contribution of quantum teaching model in Islamic religious education learning in improving the students collaboration thinking skills in elementary schools. In implementing the quantum learning strategy in the learning process of Islamic religious education, the syntax that we will use is TANDUR (Grow, Experience, Name, Demonstrate, Repeat, Celebrate).

METHOD

The design of this study used a quasi-experimental method. This method is used to determine the different of the students collaboration thinking skills in Integrated Islamic Elementary Schools between quantum teaching model implementation and other cooperative model implementation in Islamic religious education learning. Quasi-experimental research conducted in this study is a non-equivalent form (pre-test dan post-test) control group design (Fraenkel, J.R. & Wallen, 2007). Both groups were given an initial test in the form of pre-test questions. In the control group, learning process was carried out using non-quantum teaching model, i.e. group discussion, while in the experimental group, learning process was carried out using quantum teaching model. After the two groups were given treatment, at the end of the lesson the two groups of students were given a post-test and questionnaire. The set of pre-test and post-test

questions use the same test set. The sample in this study amounted to 55 students. It consists of 23 students in the experimental class and 22 students in the control class. The design in this study can be seen in Table 1.

Table 1
Research design

Group	Initial observations	Treatment	Final observations
Experiment (23 Students)	O_1	X_1	O_2
Control (22 Students)	O_3	-	O_4

Note: O_1/O_3 : Pre-test, O_2/O_4 : Post-test and X : Quantum teaching model

Furthermore, the research flow can be seen in Figure 1.

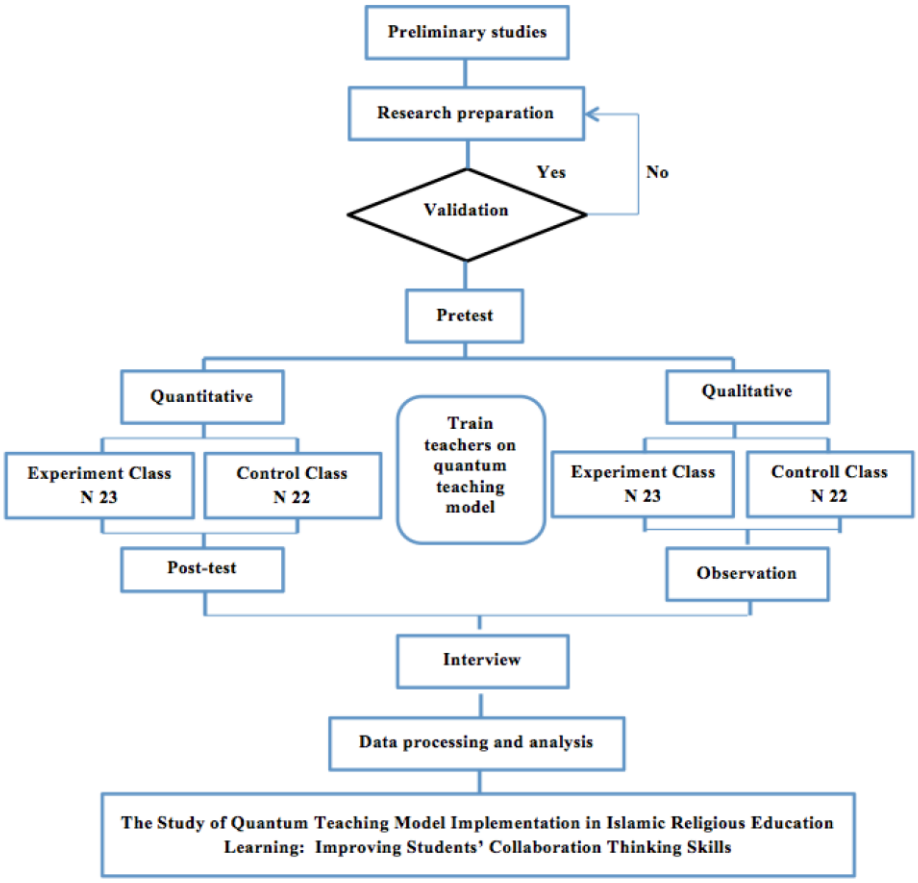

Figure 1
The research flow

Based on Figure 1, the steps in conducting this research, the researcher conducted a preliminary study and research preparation. Then distinguish the research subjects, namely the control class and the experimental class. After that, a pre-test was conducted on both research subjects and data analysis. Furthermore, the quantum teaching model was implemented in the experiment class for teaching Islamic religious education with syntax of TANDUR, i.e. Grow, Experience, Name, Demonstrate, Repeat, Celebrate. While the group discussion model was applied in the control class. After that, each class (control class and experimental class) was given a post-test and the results were observed and analyzed.

FINDINGS

This research was begun by determining whether the two classes used as subjects in the implementation of quasi-experimental design are two homogeneous classes or not. To know this, pre-test and post-test have been developed. The pre-test was given before the implementation of quantum learning, while the post-test was carried out after the treatment. These two types of tests were tested for its validity and reliability. We tested nine questions. Based on the results of the validity test, the calculated pearson correlation score of Sig. (2-tailed), of all question items starting from question 1 to question 9, is less than 0.05. It can be concluded that the question instrument for all questions are valid. Furthermore, the Alpha Croncbrach score showing the realibility test, it gives 0.754 which is greater than 0.60. It can be concluded that the question instrument is reliable, see Table 2.

Table 2
The reliability test of post-test instrument

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,794	,754	10

Furthermore, the results of the homogeneity test of the two quasi-experimental classes obtained from the pre-test are as follows:

Table 3
Test of homogeneity of variances

Value			
Levene Statistic	df1	df2	Sig.
.093	1	49	.762

Based on the output Table 3 of the Test of Homogeneity of Variances, it is known that the significance value (Sig.) of the students collaborative thinking skill pre-test is 0.762. Since the value of Sig. 0.762 > 0.05, it can be concluded that the variance of the collaborative thinking skill pre-test of the control and experimental classes is homogeneous.

The last step is to test the difference of the two means between the control and experimental classes. It aims to determine the effect of quantum teaching-learning. From the research design in Table 1, it was found that the experimental class was given quantum teaching treatment while the control class was not given this type of learning treatment, only using the cooperative learning type, namely group discussion. After being given the treatment then a normality test was carried out on the data from the post-test collaborative thinking skills. The results of the normality test can be presented in Table 4.

Table 4
Tests of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Value	.142	51	.112	.977	51	.424
a. Lilliefors Significance Correction						

The significance value (p) in the Kolmogorov-Smirnov test is 0.112 (p > 0.05), so based on the Kolmogorov-Smirnov normality test the data is normally distributed. The significance value (p) in the Shapiro-Wilk test is 0.424 (p > 0.05), so based on the Shapiro-Wilk normality test the data is also normally distributed.

Finaly, we end up with dealing with statistical analysis by using Independent Sample *t*-test to test weather there is a significant different between experiment class and control class under the implementation of quantum teaching. Table 5 shows that the result on the level of confidence 5% the value of Sig. (2-tailed) = 0,007<0.05. It means $t_{count} > t_{table}$ which concludes H_1 is accepted and H_0 is rejected. It implies the difference between the two classes is significant. It concludes that the implementation of quantum teaching model can improve the students' collaboration thinking skills in Islamic Religious Education Learning.

Table 5
Independent samples test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nilai	Equal variances assumed	.093	.762	-2.817	49	.007	-2.235	.794	-3.830	-.641
	Equal variances not assumed			-2.809	47.598	.007	-2.235	.796	-3.836	-.635

Furthermore, based on the data analysis of student's collaboration thinking skills questionnaire with the indicators of effective work, compromy, role share, productive,

and evaluation were obtained the data in Table 6 and Table 7. For detail information, we depict the two tables in Figure 2 and Figure 3.

Table 6
The percentage of the student's collaboration thinking skills achievement

	Effective Work	Compromy	Role Share	Productive	Evaluation
Post-test	80%	84%	80%	81%	80%
Pre-test	67%	70%	69%	71%	72%

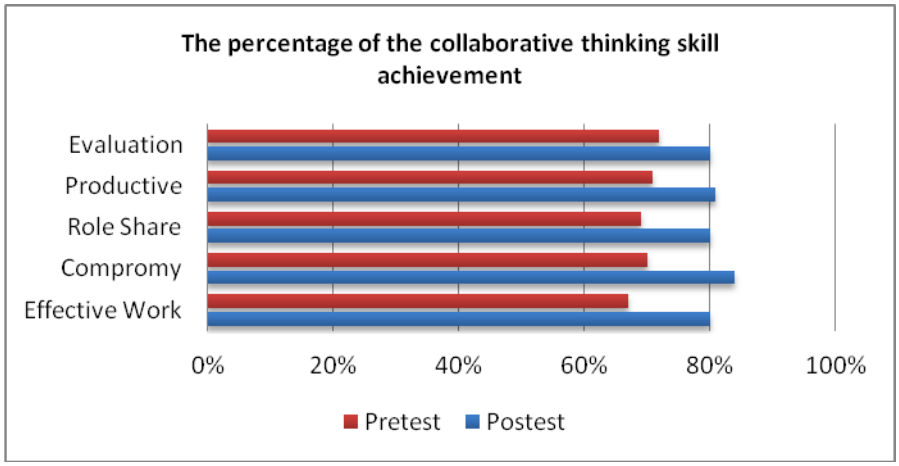

Figure 2
The comparison of the collaborative thinking skills on the experiment class between pre-test and post-test

Table 7
The percentage of the student's collaboration thinking skills criteria achievement

	Effective Work	Compromy	Role Share	Productive	Evaluation
Poorly Developed	4.35%	4.35%	4.35%	4.35%	4.35%
Fairly Developed	13.04%	8.70%	13.04%	17.39%	17.39%
Developed	26.09%	21.74%	21.74%	26.09%	26.09%
Well Developed	34.78%	34.78%	26.09%	30.43%	30.43%
Very Well Developed	26.09%	30.43%	34.78%	21.74%	21.74%

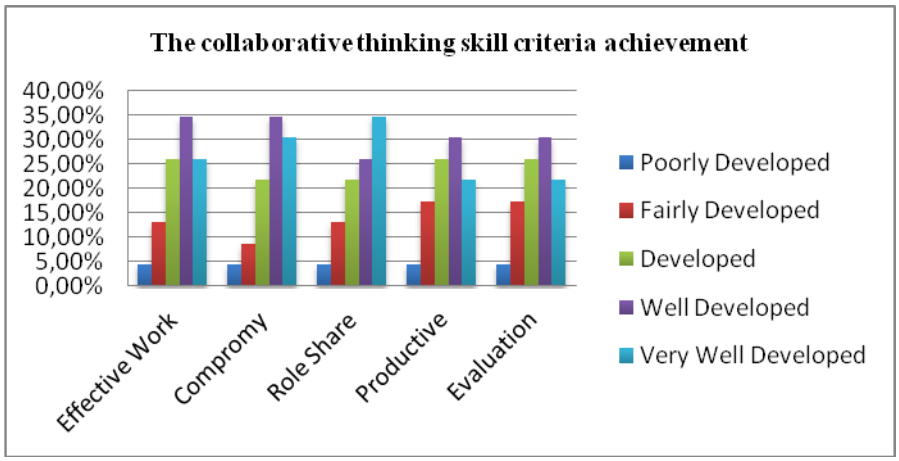

Figure 3
The comparison of the collaborative thinking skill criteria on the experiment class between pre-test and post-test

Considering the two figures, Figure 2 and Figure 3, it is known that the percentage of each indicator of the student's collaboration thinking skills in the experiment class for pre-test score and post-test score significantly increase. It is also sharpened by the collaborative thinking skill criteria achievement, which shows that most criteria of the students collaborative thinking skill lie on the developed, well developed and very well developed.

Table 8
The descriptive data of the student's collaboration thinking skills trough their tests

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test of Experiment Class	23	73	77	75.00	.998
Post-test of Experiment Class	23	80	83	81.50	.869
Pre-test of Control Class	22	72	77	74.50	1.305
Post-test of Control Class	22	73	77	75.00	1.105

Based on the above Table 8, we can conclude that the implementation of quantum teaching model affects the students' collaboration thinking skills. The table of post-test score shows that the minimum, maximum and mean scores of the student's collaboration thinking skills in experimental class is higher than the scores of the student's collaboration thinking skills in control class.

We have studied the implementation of quantum teaching model in the experiment class and seen the affect by using statistical analysis. Now, the study was continued by doing in-depth interviews with students to obtain a portrait phase of the students' collaborative

thinking skills process. Interviews were conducted on three research subjects of the experiment class to determine students' collaborative thinking skills in solving problems in Islamic religious education learning. The flow of students' collaborative thinking skills can be seen in Figure 4. This figure shows the combination of three students phase portrait, namely developed, well-developed and very well developed. The interview also consider the flow of the implementation of quantum teaching syntax, namely TANDUR, i.e. Grow, Experience, Name, Demonstrate, Repeat, Celebrate.

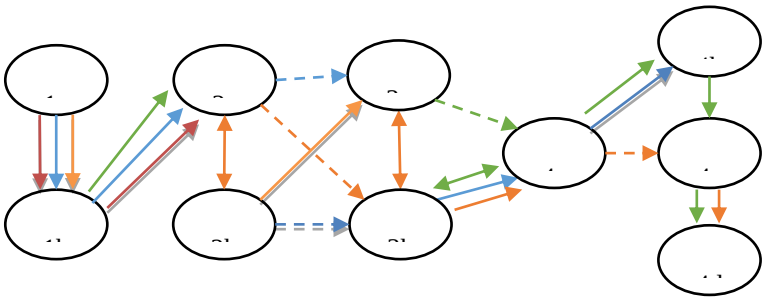

Figure 4
The combination of the student phase portraits of their colaborative thinking skill

DISCUSSION

The findings confirm that the teaching models for a teacher must concern in managing the class such that the class remains conducive from the starting till the end of learning process. Since the teaching models are an important element to stimulate students and learning activities being meaningful, fun, and joyfully. Besides, the learning strategy will also make students to have a good focus on learning in classroom and have a good attitude as well as to build a dynamic social relationship between teachers and students. Thus in learning, teachers must have perfect readiness and preparation, especially in the selection and use of learning strategies.

The use of quantum teaching model in Islamic religious education learning, which is studied in this paper, is one of a good choice especially to improve the students' collaboration thinking skills. Under this research, it can be observed from the active involvement of students in the learning process, including in discussion activities and group discussion and collaboration among students fellow (Ramadhani & Ayriza, 2019). The collaboration and active participation of the students in learning can also be seen in the activities of effective work, productivity, and evaluation, as well as the role share of students.

These findings indicate that the quantum teaching model is becoming an alternative in teacher efforts to improve student learning outcomes of Islamic religious education. The quantum learning strategy used in learning gives a big chance to collaborative learning among students and finally gives a rise of their spirit, good religious attitudes, and maximum learning outcomes.

In practice in the classroom, an Islamic religious education teacher can follow these steps of TANDUR (Grow, Experience, Name, Demonstrate, Repeat, Celebrate), namely: (1) Grow, the teacher develops the interest and attention of students in the learning process, (2) Experience, the teacher facilitates the learning process with a variety of meaningful learning experiences, (3) Name, the teacher guides students to make conclusion or verification based on the information and facts found, (4) Demonstrate, The teacher provides the opportunity for students to present the results of the group work that has been done, (5) Repeat, the teacher helps students to internalize the knowledge and/or information that has been obtained, and (5) Celebrate, teachers and students together provide positive feedback during the learning process.

Above all, in the tradition of Islamic education, there is a beautiful treasure trove of ethics in using learning strategies. Asy'ari in (Nahar, Syamsu & Suhendri, 2020), suggested: ask students to say *basmallah* before start learning, accompany the students with all teacher heart and compassion, deliver detailed learning materials, evaluate learning, and be role models for students.

From TANDUR steps practiced by Islamic religious education teachers in the classroom, it can be observed the changes occurring on students, including: (1) Students can work effectively and respect each other's different opinions, (2) Students open and accommodate some ideas to achieve common goals, (3) students can share roles and responsibilities in the learning process to achieve mutual success, (4) students together have the high spirit to work hard and smart to realize productivity, and (5) Students assess each other and give appreciation for individual contributions to joint program activities.

Based on the explanation above, it is very clear that the teacher's ability to develop quantum learning steps contributes to the activeness and willingness of students to work together during the learning process (Lynch et al., 2021). Besides, the selection of learning models for teachers will make it easier for teachers to design learning content that is suitable for daily life activities, prepare to learn multimedia, and will assist teachers in designing problem-solving in improving communication and collaboration skills (Kwangmuang et al., 2021). Students' collaboration skills will become awareness and character inherent in students in the form of cognitive and socio-emotional awareness (Näykki et al., 2021), improve the competence of students in working in groups (Liu, 2021), and trigger the birth of continuous innovation and creativity that will even shape students' skills in collaborative critical thinking to solve problems faced in everyday life together (Wilkerson & Trellevik, 2021) (Laisema & Wannapiroon, 2014) and students' academic performance (Omodan & Tsotetsi, 2018).

Another interesting thing is that collaborative skills resulting from learning carried out through the quantum learning model will make students good citizens, have logic skills, self-criticism, reflection, higher-order thinking skills, ethics, and good human dimensions (Rombout et al., 2021) which is characterized by having empathy for others whenever and wherever they are (Wilkerson & Trellevik, 2021). Students' collaboration skills will make students confident, tough, and positive interdependence (Scager et al., 2016). However, one thing that is important to note is that to realize good learning, it is

necessary to get support from regulations from policymakers. This is important to ensure quality education in schools in particular and a country in general (Dewi et al., 2018). In addition, all teachers to be involved in meaningful collegial collaboration (Zabeli, Naser; Anderson, Jeffrey Alvin; Saqipi, 2018) under the implementation of quantum teaching model.

CONCLUSION

These findings indicate that quantum teaching model in Islamic religious education learning influence increasing students' collaboration thinking skill in Elementary Schools. In other words, quantum teaching model is an alternative for teachers in managing learning to get effective and efficient learning outcomes.

Therefore, this research is expected to encourage teachers to improve their ability to manage their classroom by using quantum learning model through various self-development activities and continuous professional development, including attending webinars, subject teacher deliberation in Islamic religious education, and/or other activities. Besides, this research is also expected to give an input for stakeholders to produce policies to provide reinforcement and provision for Islamic religious education teachers in schools in the management of learning.

Furthermore, the researchers realized that this study had limitations. This limitation is that to increase students' interest in learning and the learning outcomes of students' Islamic religious education, not only quantum learning strategies are determined, but other factors are also determined. Therefore, it is hoped that other researchers will examine more deeply other factors that are considered to influence students' interest in learning and student learning outcomes of Islamic religious education. Finally, increasing the ability of teachers in developing quantum teaching models needs to be improved simultaneously through government policy programs or independently through deliberation activities for teachers of Islamic religious education subjects.

AKNOWLEDGEMENT

We gratefully acknowledge the suggestion and recommendation given by our coleagues in the Postgraduate of Islamic Education Study Program, University of Islam Negeri (UIN) Sumatera Utara, Indonesia of the year 2022.

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