

Quantum Learning Model Influence using Series of Drawings Towards The Fifth Grade Students' Narrative Writing Skill

Wahyul Huda^{1✉}, Hari Bakti Mardikantoro² & Haryadi²

¹ Public Elementary School 5 Gondosari, Kudus, Jawa Tengah, Indonesia

² Universitas Negeri Semarang, Indonesia

Article Info

History Articles

Received:
June 2018
Accepted:
July 2018
Published:
December 2018

Keywords:

*narrative essay,
quantum learning,
series of drawings*

DOI

<https://doi.org/10.15294/jpe.v7i3.24258>

Abstract

This study aims to determine the effect of quantum learning model with the series of drawings media on the learning achievement to write narrative of the fifth grade students of elementary school in The district of Kudus. The type of this research is quasi-experimental with non equivalent controlled group design. The sampling technique used was Cluster Random Sampling followed by purposive sampling technique. The result of n-gain analysis shows that the quantum learning with the drawing media in the control class gets 0.29 with low criteria while the experimental class gets 0.33 with moderate criteria. The ttest results show that t_{value} is 5.911 while t_{table} is 2.006 or $t_{\text{value}} > t_{\text{table}}$ and the significance of it is 0.000 so H_0 is rejected. The linear regression test of the quantum learning model by using series of drawing media towards the learning result of writing essay ability is 97.0%. Based on the data analysis it can be concluded that there is a significant influence on the use of quantum learning models by using a series of drawings as media on the results of students' ability in learning to write narrative essays.

© 2018 Universitas Negeri Semarang

✉ Correspondence address:
Gondosari RT.03/RW.11 Gebog, Kudus, Jawa Tengah, 59354
E-mail: wahyulhuda1987@gmail.com

INTRODUCTION

The process of learning in primary schools is essentially aimed to provide an experience in changing students' behavior. This learning process activity guides students to learn various subjects with some basic skills in Bahasa Indonesia lesson. Language arises and develops because of the interactions between individuals within a society.

Currently, Indonesia is a country with a low literacy rate, both for reading and writing. This is proved by the results of the research Program for International Student Assessment (PISA) which states that Indonesian literacy culture in 2012 is on the 63rd Rank out of 65 countries. UNDP figures also state that the adult literacy rate in Indonesia is only 65.5 percent, while Malaysia has 86.4 percent. This condition is in line with the statement of Taufik Ismail (Abidin 2015) that Indonesia is still shortsighted in reading and paralyzed in writing.

Writing essays is one of the learning materials of writing skills given at the primary school level. Narrative as one of the learning materials language skills have a function to teach students to represent ideas in the form of experience in written language, by taking into account the existing rules. In accordance with the basic competence of the Indonesian 5th grade elementary school, the form of narrative essay that being taught is the fictional narrative.

In the district of Kudus, from 70 elementary schools which have implemented the 2013 curriculum of 425 primary schools, the final assessment of the 5th grade on the 1st semester class in Bahasa Indonesian theme 1 to theme 5, the average of completeness reaches 80%. However, in the assessment of theme 1 and 2, the skills of writing and developing paragraphs of mastery were only 65%. The data is obtained from the level of primary school in Kudus district which is found in the Office of Education, Youth and Sports Department of Kudus.

Based on the constraints experienced by students in learning writing essay then, what needs to be considered is the application of the model used. Appropriate models will have an

impact on learning that might engage students to be active and creative, creating meaningful learning. Therefore, it takes a learning model that can stimulate students to be active and creative. Learning model is a conceptual framework that describes systematic procedures in organizing learning experiences to achieve specific learning goals (Zulaeha, 2013). One learning model that can be used in the learning of writing essay and able to motivate students to be active and creative is the learning model of quantum learning.

Bahaddin (2014) explains that learning of quantum learning model is learning that is able to create student to be more interact with other and more active, so that their of talent and potential can grow quantum learning model is also important to improve learning achievement by removing learning barriers through the use of appropriate means and tools, students can learn very easily.

In addition to learning models that have not been applied by teachers, the limitations in number and type of media were also influence textually and the limitations of instructional media become one of the causes of the low activity and learning outcomes in particular Indonesian language written student bans. Media plays an important role as an intermediary to facilitate the process of teaching and learning, in order to streamline communication between teachers and students. (Djamarah & Zain, 2013) said that The benefits of using media in teaching and learning activities, especially for elementary school, are very important, because at this time students still think concretely, they have not been able to fully think abstract. This is inline with the research result of (Naz & Akbar, 2010) state that media or teaching aids can help teachers in transferring knowledge in an impressive way, and designing learning more effectively.

Based on the fact, the application of quantum learning models with series of drawing media have benefits in providing opportunity for students to develop their potential in the learning process, so that students can write good narrative.

METHODS

The population in this study is the 5th grade elementary school students who have implemented the 2013 curriculum in Kudus District which consists of 70 schools spread in 9 districts. The sample of research taken two classes with Cluster Random Sampling technique followed by purposive sampling technique due to the design of this study requires an equivalent condition when the process of learning. So in this research SD 3 Karangmalang as the controlled class and SD 2 Gondosari as the experimental class. This study included quasi-experimental research with form non-equivalent controlled group design. The independent variable in this research is the application of quantum learning model. The moderator variable is the series of drawings media while the dependent variable is the result of learning to write narrative essay of students.

There are two methods used here to gain the research data. Interview method to obtain preliminary data of students was used to get population data for determination of research sample, and test method in pretest-posttest form was used to get the data of learning achievement of writing from students' narrative text. The learning model used in each class is the same but difference in the use of media, The experimental class using quantum learning with series of

drawings while in the controlled class was applied the learning model of quantum learning without media.

The analysis test was conducted by instrument analysis and data analysis. Instrument analysis includes validity and reliability test. Methods of data analysis consist of analysis of initial and final data. Initial data analysis included normality test and homogeneity test. The final data analysis includes n-gain calculation, t-test and linear regression test.

RESULTS AND DISCUSSION

In writing narrative essay there are two aspects that serve as a guiding judgment that is the aspect of narrative elements and linguistic aspects. Aspects of narrative elements are divided into sub aspects, namely, (1) themes, (2) figures, (3) place background, (4) time background, and (5) story line. The linguistic aspects include, (1) the contents of the proposed ideas, (2) the organization of content, (3) the structure of language, (4) choice of structure and diction, and (5) spelling and punctuation.

Data of learning achievement of students' writing narrative is obtained from pretest and posttest. The pretest and posttest scores of experimental class students and controlled class are shown in Table 1 below.

Table 1. Score of Pretest and Posttest Learning Result of Students' Writing Narrative from Experimental Class Students and Controlled Class

Data	Class	N	Ideal score	Min score	Max score	Average	P (%)	Annotation
Pre-test	E	28	100	53	78	64.07	64	C
	C	27	100	40	78	61.29	61	C
Post-test	E	28	100	63	90	75.93	76	B
	C	27	100	60	88	72.78	73	B

Table 1 shows that the average initial score of the experimental class learning achievement is 64.07 while the controlled class is 61.29 which both belong to the moderate category. The score increased after the learning, the average score achieved by the experimental class students is 75.92 while the control class is 73.11. The class that used a quantum learning model with a series of drawing media reach higher score than that of the control class.

Before The learning, the result of students' writing narrative skill from two classes studied fall into category C (moderate). After the learning, the result of students' writing narrative skill on the experimental class and controlled class reaches category B (high).

The average difference test was conducted to determine the difference between pretest and posttest score between those two classes studied. In the posttest, it has been tested normality and

homogeneity test all were normally distributed. To know the difference between pretest and posttest value then n-gain calculating was conducted.

The n-gain test is performed to determine the difference between the pretest and posttest values. The n-gain test is performed after all prerequisite tests are met, both normality test and homogeneity test. Based on the normality test and homogeneity test it is known that the data is normally distributed and homogeneous. The results of the n-gain test is presented in Table 2.

Table 2. The n-gain test results

Group	Avarage		N-Gain
	Pre-test	Post-test	
Experimen Class	64.07	75.93	0.33
Control Class	61.29	72.78	0.29

Table 2 shows that the n-gain result in the experimental class is 0.33 and the N-gain in the control class is 0.29. The N-Gain classification is as follows: $<g>< 0.30 =$ low, $0.30 <g> 0.70 =$ moderate, $<g>> 0.70 =$ height (Hake, 2007) . The

result of N-gain experimental class showed 0.33 can be included in the moderate category. While the N-gain in the control class is 0.29 so it belongs to the low category. Based on the gain test results it can be concluded that the experiment class score is higher than that of the controlled class, so it can be concluded that the learning activity in the experimental class is better than that of the controlled class. Next, to test the hypothesis then proceed with the t-test.

In hypothesis testing, there are some provisions that should be used as guidance. The rule is that if $t_{value} < t_{table}$ or significance value > 0.05 , then H_0 is accepted, and if $t_{value} > t_{table}$ or significance value < 0.05 , then H_0 is rejected. In this study, there were 55 students as the sample, then the value of degrees of freedom ($dk = n - 2 = 55 - 2 = 53$ and 5% error level for 2 parties test can be known on value is 2.042 (Priyatno, 2010). The result of hypothesis test using SPSS version 23 of independent sample t test is presented in Table 3.

Table 3. The t-test Result Analysis

	t-test for Equality of means						
	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
						Lower	Upper
Equal variances assumed	5.911	53	.000	14.632	2.475	19.597	9.668
Equal variances not assumed	5.897	51.497	.000	14.632	2.481	19.613	9.652

From Table 3 it is known that the data in the study is homogeneous, so to gain the results of the hypothesis testing can be seen in the column of assumed equal variances. Conversely if it is not homogeneous, to know the results of the hypothesis testing can be seen in the column equal variances not assumed. Based on the calculation result with SPSS version 23 column equal variances assumed it can be seen that t_{value} is 5.911 and its significance is 0.000. From the calculation results it can be seen that $5.911 > 2.006$ or $t_{value} > t_{table}$ and $0.000 < 0.005$ or significance value < 0.05 . Based on the provisions that apply to testing the hypothesis that researchers have described above, H_0 is rejected. Thus, the conclusion of this research is that there are differences in the result of learning how to

write a narrative essay between students in the control class before the application of the learning model of quantum learning and experimental class after the application of the learning model of quantum learning with the series drawings media.

The result of linear regression test of the influence of quantum learning model on the result of students' learning essay writing on the experimental class is presented in Table 4.

Table 4 shows that the experimental class regression test obtained results of 22.080 with a significance of 0.000. From the calculation results can be seen that $0.000 < 0.005$. So there is an influence of learning model of quantum learning on the result of students' learning how to write essay. Furthermore, to see the value of the

contribution or influence of X to Y, it can be seen the output on the Summary Model is the R Square value (Sukestiyarno, 2011). The result of the R Square test between the quantum learning

model and the learning result of the students' learning to write narrative text on the experimental class is presented in Table 5.

Table 4. Result of Regression Analysis Influence of Learning Model of Quantum Learning on The Result of Students' Learn to Write Essay

Model	Unstandardized coefficients		Standardized cCoefficients	t	Sig.
	Beta	Std. error	Beta		
(Constant)	-32.099	4.251		-7.551	.000
Model quantum learning	1.47	0.067	0.975	22.080	.000

a. Dependent Variable: Writing Narrative

Table 5. Result of R Square Test between Learning Model of Quantum Learning to The Learning Result of The Students' Learning to Write Narrative Text

R	R square	Adjusted R square	Std. error of the estimate
.975 ^a	.951	.949	2.204

Predictors: (Constant), Model quantum learning
 Dependent variable: Writing narrative

In Table 5 is can be seen that the test results determination R Square value of 0.951 which means that 95.1% variation in the magnitude of the result of learning to write the essay of students can be explained by variations of variables of learning model of quantum learning. While the remaining other 4.9% were outside the research model.

The influence of learning by using the quantum learning model on the learning outcomes of students' essay writing was analyzed by using linear regression test. To determine the influence of the use of quantum learning model on the result of students' learning to write essay, the data was taken from the controlled class and the experimental class. The controlled class that gets the treatment of conventional learning model is the 5th grade students in SD 3 Karangmalang, while the experimental class which gets the quantum learning method was the 5th grade students at SD 2 Gondosari. Based on the results of linear regression analysis, it is obtained information that learning by using the quantum learning model had made positive influence to the results of learning how to write essay of the students. This is in accordance with research that conducted by Supramono (2016) who found that the application of the quantum learning model in

class 3d grade has increased in each meeting based on 6 aspects observed namely Grow it, Experience it, Name it, Demonstrate it, Repeat it and Celebrate.

Data of learning result of student writing narrative essay with the application of quantum learning model between experiment class and controlled class can be seen on figure 1.

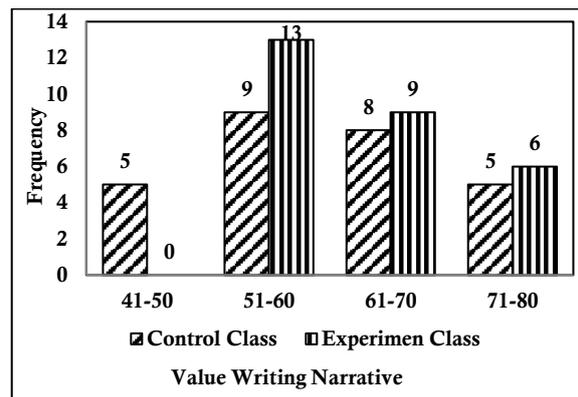


Figure 1. Value of Learning Outcomes of Students' Narrative Essay Writing Learning with Quantum Learning Model

The data of learning result of writing student essay writing between experiment class and control class showed significant difference. Treatments with the application of quantum learning model to produce different data in both classes. The quantum learning model applied helps students in the process of acquiring knowledge (Nyna, et al. 2015). This can seen in the results of the students' narrative writing skills after being given the treatment in figure 1.

Students' learning outcomes write narrative essays with the application of quantum models without drawing media series are still

have many thing that have not been completed. For examples of student learning outcomes can be seen in figure 2.

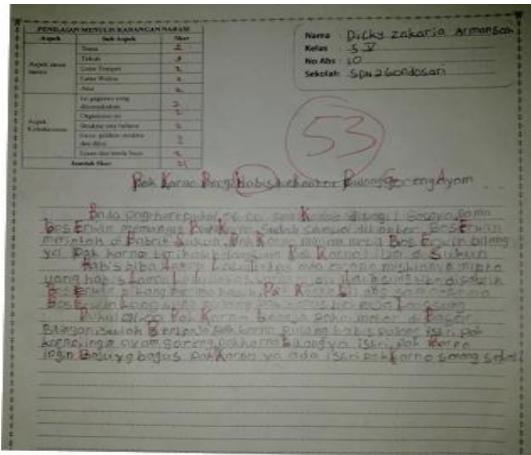


Figure 2. The Example of Learning Outcomes of Students' Narrative Essay Writing Learning With Quantum Learning Model

In the figure 2 shows the score of students writing narrative essay with the application of quantum learning model without media. In that picture, the student scores still below the average of the class. The use of spelling and sentence structure is still unclear, the story line is still not visible, and the use of prefix and capital letters do not in accordance with the rules of writing essay. This proves that elementary school students need a concrete example to put their ideas into writing. Media that suits the characteristics of elementary school students and at the same time makes it easier to arrange narrative essays are series drawings. A sample drawing series in learning can be seen in the figure below.

The drawing media series is a two dimensional visual media containing the sequence of images, between the one image and the other one which is interconnected and states a sequential event. This media used to stimulate students' thinking to be able to express ideas or imagination in writing. The drawing media series can illustrate the form or event to the students so that learning is not only memorized but also rather to think.



Figure 3. The Example of Drawing Series in Learning Process

The use of drawing media series can also assist teachers in delivering material, as the images looks so real that students can clearly see and understand what is being talked about, easy to get, cheap, and easy to use both individually and in groups. The use of drawing series will be able to stimulate students to participate actively in learning, especially learning to write from the activity of watching the picture.

Furthermore, to see the influence of quantum learning model with drawing media series to the result of learning writing narrative essay by conducting second linear regression test. The results of linear regression test of the influence of quantum learning model by using the drawing media series to the result of learning to write student essay writing on the experimental class can be seen in Table 6.

From Table 6 it can be seen that the experimental class test regression with the application of learning model of quantum learning using series of drawings as the media obtained results of 28.455 with a significance of 0.000. From the calculation results can be seen that $0.000 < 0.005$. So there is influence of learning model of quantum learning by using the drawing media series to the learning achievement of student in essay writing. The result of R Square test between the quantum learning using the series drawing media on the result of students' learning of narrative writing on the experimental class can be seen in Table 7.

From Table 7 above, it can be seen that the test results determination R Square value of 0.970 which means that 97.0% variation in the magnitude of the result of learning to write the essay of students can be explained by variations

of variables of learning model of quantum learning with serial image media. While the rest, 3.0% is another influence outside the research model.

Table 6. Result of Regression Analysis Influence Learning Quantum Learning Model by Using Series of Drawings on The Results of How to Write Narrative Essay

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	-12.774	3.024		-4.,225	.000
Model QL using series of drawings	1.135	.040	.985	28.455	.000

a. Dependent Variable: Writing Narrative

Table 7. Results of R Square Test between Quantum Learning Models by Using Series of Drawings as The Media on The Learning Outcomes

R	R square	Adjusted R square	Std. error of the estimate
.985 ^a	.970	.969	1.677

Predictors: (Constant), Model QL using series of drawings
 Dependent variable: Writing narrative

The influence of the learning of the application of quantum learning model with the drawing media of the series on the result of learning to write student essay writing was analyzed by using linear regression test. To determine the effect of quantum learning model with serial drawing media on the learning achievement in essay writing. Where control class gets treatment of learning model of quantum learning that is student of class V at SD 3 Karangmalang, while experimental class gets the quantum learning treatment with series of drawings as the media that is student of class V at SD 2 Gondosari. Based on the results of linear regression analysis, it was obtained information that learning by using the model of quantum learning with the media drawing series has made positive influence to students' learning achievement writing narrative essay. This is in accordance with Sutrisno, et al. (2013) study which explains that there is an influence of learning using quantum teaching model with series drawing media on learning outcomes.

The data of learning result of students' narrative essay writing between experiment class and control class showed a significant difference. Quantum learning emphasizes on acceleration of learning with high level of success (Nasrulloh, 2015). The application of learning quantum learning model with serial image media produces different data in both classes. This can be seen in the result of writing skill of narrative essay of students after being given the treatment to reach 100% classical completeness in the experimental class.

The data results of by students' learning in writing narrative essay by applying the quantum learning using media of series of drawings between experiment class and control class can be seen in figure 4.

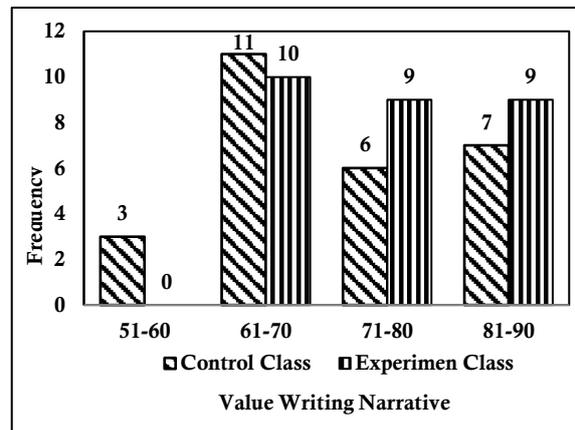


Figure 4. Values of Learning Outcomes of Students' Learning to Write Narrative Essay with Quantum Learning Method and Series of Drawings as The Media

Students' learning outcomes writing narrative essays with the application of quantum models with drawing media series showed significant improvement in outcomes. The examples of student learning outcomes can be seen in figure 5.

In the picture the student's score is above the average class with a very good category. The use of spelling and sentence structure were appropriated, the storyline cleared, and the use of prefix and capital letters in accordance with the rules of writing essay. With the drawing media series can provoke the imagination of students to

looking for an idea or activity based on the image that has been presented by the teacher. Then students can look for other ideas that are not given in the picture to be developed into narrative. The use of drawing media series in the students' narrative writing skills can bring a better change for the way of students writing.

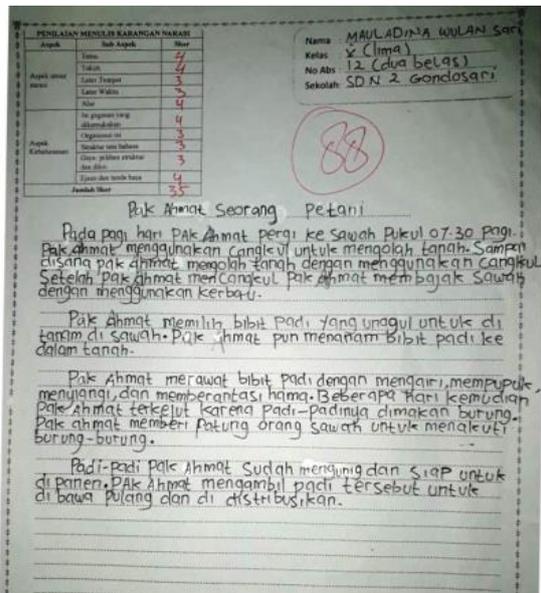


Figure 5. Example Value of Learning Outcomes Oof Students' Narrative Essay Writing Learning with Quantum Learning of Drawing Media Series Model

The data of students' learning achievement in writing narrative essay between the experiment class and controlled class show us a significant difference. Treatment with the application of learning model by using series of drawings as media has produce different data in both classes. This can be seen from the results of the students' narrative essay writing skills after being given treatment reaching 100% completeness (of 28 students) in the experimental class. In the control class, the percentage of student completeness reached 89% (24 of 27 students). The average posttest score was 75.92 in the experimental class and the posttest mean value for the control class was 72.78. The highest score in the experimental class was 90 and the controlled class was 88. The lowest value in the experimental class was 63, while in the controlled class was 60.

Relevant research on the use of quantum learning model with series of drawings as media is done by Dawn (2013) which explains that students' learning outcomes by using quantum teaching model with series of drawing as the media on short story material of students in the 5th grade SD Negeri Kuripan Kabupaten Wonosobo, academic year 2012/2013, obtained the average value of pretest 65.5 and posttest 74.5. Student learning outcomes using conventional models with lecturing method on the subject matter of short stories of children in grade V SD Negeri Kuripan academic year 2012/2013, obtained the average value of pretest 65.5 and posttest 69.0. Thing that differs in this research is on the material applied. Fajar examines short stories while in this study narrative writing was examined. This explains that the research with the application of quantum learning model using series of drawings as the media has more significant effect on writing essay text of the 5th grade elementary school students.

Implementation of learning quantum learning model with series of drawing media provides a new learning experience for students. Students have the opportunity to complete tasks, either individually or in groups. The atmosphere built up in the quantum class drive the students more passionate and able to imagine and create (Mahda, 2015). The application of quantum learning models encourages students to think solving problems, but in a way that is fun. Quantum learning is an interesting and fun learning that makes use of all the potentials that exist in the learning moment, so that students are comfortable, encouraged and has a high interest in learning. Learning activities will be achieved when in the learners there has been a change of knowledge and behavioral changes (Puspitorini, 2014). This model is appropriate to develop insight, instill discipline, and skills in a particular way for students (Heni, et al. 2013).

The use of series of drawings as media can also attract students' attention to become interested to follow the learning activity. Working together in groups can foster a good social attitude for students. Good social attitudes are demonstrated through behavior, such as

respecting each other's opinions and prioritizing common interests. This shown that the learning media used is successful and can be said as good criteria as it meets the predetermined indicators (Saputro, et al. 2013). Students are also given the opportunity to convey the results of the discussion in front of their classmates. It takes courage though to convey the results of the discussion.

The teacher presents narrative writing materials using series drawings that are familiar with the daily life of the students. With the series drawing, the teacher lures the imagination of students to look for an idea or activity based on the image that has been presented by the teacher. Then students can look for other ideas that are not in the picture to be developed into narrative. The use of drawing media series in the students' narrative writing skills can bring a better change from the way students write.

CONCLUSION

There is a significant difference of influence between quantum learning model without media with quantum learning model using series of drawings as the media to the result of students' learning to write essay. The result with the application of quantum learning model without media equal to 95.1% of the result of students' learning to write narrative essay with quantum learning model with series of drawings media equal to 97.0%. Teachers can apply the quantum learning model with series of drawing media as one of the solutions to improve student's learning activity in writing narrative essay.

REFERENCES

- Abidin, Y. (2015). *Pembelajaran Bahasa Berbasis Pendidikan Karakter*. Bandung: Refika Aditama.
- Bahaddin, M., & Yusuf, A. (2014). An Investigation The Effect of Quantum Learning Approach on Primary School 7th Grade Students' Science Achievement, Retention and Attitude. *International Journal of Research in Teacher Education*, 5(2), 11-23.
<http://ijrte.penpublishing.net/makale/145>
- Fajar, C. P. (2013). Model *Quantum Teaching* menggunakan Media Gambar Seri terhadap Hasil Belajar Bahasa Indonesia Kelas V SD Negeri Kuripan Wonosobo. *Malih Peddas (Majalah Ilmiah Pendidikan Dasar)*, 3(1), 65-73.
<http://journal.upgris.ac.id/index.php/malihpeddas/article/view/624>
- Hake, R. R. (2007). *Design-Based Research in Physics Education Research*. NSF Grant DUE
- Heni, Y., Supriyanto, T., & Rusilowati, A. (2013). Keefektifan Pembelajaran Menulis Puisi dengan Model Kuantum dan Model Instruksi Langsung Berdasarkan Minat Belajar Sastra Peserta Didik Sekolah Dasar. *Journal of Primary Education*, 2(1), 161-165.
<https://journal.unnes.ac.id/sju/index.php/jpe/article/view/1253>
- Mahda, H. R., & Zulaeha, I. (2015). Keefektifan Pembelajaran Menyusun Teks Cerita Pendek dengan Model *Quantum* dan *Project Based Learning* (PBL) pada Siswa SMP. *Lingua Jurnal Bahasa dan Sastra*, 11(1), 1-10.
<https://journal.unnes.ac.id/nju/index.php/lingua/article/view/8926>
- Nasrulloh, A., & Ersanghono, K. (2015). Penerapan Model Pembelajaran *Quantum Learning* dan *Active Learning* pada Materi Larutan Penyangga. *Chemistry in Education*, 4(1), 46-52.
<https://journal.unnes.ac.id/sju/index.php/chemined/article/view/3563>
- Nyna, A., Parmin, & Sudarmin. (2015). Implementasi *Quantum Learning* Berbantuan *Mind Mapping Worksheet* untuk Mengukur Kemampuan Komunikasi dan Hasil Belajar Peserta Didik. *Unnes Science Education Journal*, 4(3), 1022-1030.
<https://journal.unnes.ac.id/sju/index.php/uscej/article/view/8856>
- Naz, A. A., & Akbar, R. A. (2010). Use of Media for Effective Intruction its Importance: Smoe Consideration. *Journal of Elementary Education*, 18(1-2), 35-40.
[http://pu.edu.pk/images/journal/JEE/PDF-Files/JEE-18\(1-2\)%20No_3.pdf](http://pu.edu.pk/images/journal/JEE/PDF-Files/JEE-18(1-2)%20No_3.pdf)
- Priyatno, D. (2010). *Paham Analisa Statistik Data dengan SPSS*. Yogyakarta: MediaKom.
- Puspitorini, R., Prodjosantoso, A. K., Subali, B., & Jumadi, J. (2014). Penggunaan Media Komik dalam Pembelajaran IPA untuk meningkatkan motivasi dan hasil belajar kognitif dan afektif. *Cakrawala Pendidikan Jurnal Ilmiah Pendidikan*, (3), 413-420.
<https://journal.uny.ac.id/index.php/cp/article/view/2385>

- Saputro, E. B., Sopyan, A., & Subali, B. (2016). Kontribusi Media Pembelajaran Interaktif untuk Membantu Meningkatkan Pemahaman Konsep Pembiasan Cahaya pada Siswa Kelas X SMA. *Phenomenon: Jurnal Pendidikan MIPA*, 3(2), 103-110.
<http://journal.walisongo.ac.id/index.php/Phenomenon/article/view/140>
- Supramono, A. (2016). Pengaruh Model Pembelajaran Quantum (Quantum Teaching) Terhadap Hasil Belajar IPA Siswa Kelas III SD YPS Lawewu Kecamatan Nuha Kabupaten Luwu Timur. *Jurnal Nalar Pendidikan*, 4(2), 367-375.
<http://ojs.unm.ac.id/nalar/article/view/2401>
- Sutrisno, Zulaeha, I., & Subiantoro. (2013). Keefektifan Pembelajaran Menulis Karangan Deskripsi dengan Model Quantum dan Inkuiri Terpimpin Berpasangan berdasarkan Gaya Belajar Peserta Didik Sekolah Dasar. *Journal of Primary Education*, 2(1), 155-160.
<https://journal.unnes.ac.id/sju/index.php/jpe/article/view/1252>
- Sukestiyarno, Y. L. (2011). *Statistika Dasar*. Semarang: Unnes
- Zulaeha, I. (2013). Innovation Models of Indonesian Learning in Multicultural Society. *Journal of Procedia-Social and Behavioral Sciences*, 103, 506-514.
<https://www.sciencedirect.com/science/article/pii/S1877042813038123>