MANUSKRIP IJEP

by Padrul Jana

Submission date: 24-Jun-2020 12:23AM (UTC+0700)
Submission ID: 1348649635
File name: 00_20200623_MANUSKRIP_IJEP_PADRUL_JANA.docx (474.53K)
Word count: 4311
Character count: 24735

E – Learning During Pandemic Covid-19 Era: Drill Versus Conventional Models

https://doi.org/10.3991/ijxx.vx.ix.xxxx

Abstract—Coronavirus Disease 2019 (COVID-19) has been stated by the World Health Organization (WHO) as a pandemic. As a consequence, all teaching and learning processes have been conducted through e-learning. For that reason, this research aims at testing the computer-based drill learning and the conventional learning model through e-learning. The aspect that would be measured is the students' mathematical reflecting thinking. The research method was the quasi-experimental by employing the pre-test, before the treatment, and the post-test after the treatment. The research design employs 2 classes, the 31 students of the control class and 30 ones of experiment class. The result reveals to us that a computer-based drilling learning model would be effective if it is viewed from the perspective of students' mathematical reflective thinking ability. On the other hand, the conventional learning model would not be effectively viewed from the perspective of students' mathematical reflective thinking.

Keywords—Mathematical reflective Thinking, Drill Learning Model, Conventional Learning Model, E-learning.

1 Introduction

At the beginning of 2020, World Health Organization (WHO) has decided that Coronavirus Disease 2019 (Covid-19) as the global pandemic [1]–[4]. As a consequence, Indonesia has declared the national disaster and stated the required acts to prevent the virus spreading [5]. One of the impacts of the virus is that the teaching and learning processes have been conducted from home or learning from home. There is a significant change in the process of learning. It forces us to have a transformation to all processes of learning, from the model of face to face in a classroom to the e-learning model. The vast development of technology and broad internet coverage support the educational sector to develop the e-learning [6]. The changes process of the whole learning will change the way to learning process would be conducted.

The learning model which is used in this research is the drilling model which is computer-based and the conventional learning model. Both of the learning models were used in two different classes using e-learning. The drill learning model, if it is conducted face to face, would be effective to develop students' interest and achievement [7]–[9]. It may happen since the students in the drilling environment gain motoric and mental abilities and comprehensions [10]. The model of conventional learning can also attain the learning goals of mathematics if it is taught or applied in a class-

room [11]. It happens since, in this learning model, a teacher is free to deliver information as a whole to grow students' interest in the learning material.

Due to the pandemic of Covid-19 and force to conduct teaching and learning processes through e-learning, the researchers tested those two learning models. The drilling model was equipped with the computer during the teaching and learning processes. Meanwhile, conventional learning was still teacher-centered during the process of transferring the learning material. It becomes important since e-learning is a new thing during the pandemic of Covid-19. It needs us to find a proper formula to teach to make students understand mathematics as a whole although it is learning from home.

The mathematic reflective thinking abilities would be assessed and measures on those two learning models. It is expected that e-learning can grow students' ability to think carefully, full of consideration, sustainable and precise to face particular mathematical problems [12]. It is expected that students could get a full and comprehensive understanding of Mathematics [13]. The indicators which show us the mathematical reflective thinking are: (1) interpreting particular case based on the involved mathematical concepts, (2) identifying the mathematical concepts or formulas in a complicated mathematical problem, (3) evaluating/checking the validity of an argument based on the characters or concepts which are employed, (4) differentiating the data which are relevant and irrelevant, (5) drawing analogy from two identical cases, and (6) generalizing by providing reasons [14]. In the last part, this research is going to discuss the effectiveness of computer-based drill learning model and the conventional learning model from the perspective of mathematical reflective thinking ability through e-learning.

2 Method

2.1 Time, Place dan Research Variability

This research was conducted in April of the even semester academic year 2019/2020. Students of the seventh graders at Junior High School Muhammadiyah 3 Yogyakarta are the subjects of the research. There are 8 classes as the research population; two classes were taken by using a random sampling technique. There are 30 seventh graders in A class which was used as the experimental class. As the control class, there are 31 seventh graders in E class. The experimental class employs the computer-based drilling learning model and the control one employs the conventional model during the process of learning and teaching material. The free variables in this research are the computer-based drilling model and the conventional one. The bound variable is the students' mathematical reflective thinking.

2.2 Research Design, Data Collection Technique, and Instrument

The research design of this study is the Quasi-Experimental (The Nonequivalent Control Group Design) with the experimental and control classes [15], [16]. Both

classes are treated with the pre-test and post-test to gain the result of treatment to be accurate, to make a comparison of before and after the treatment. Observation and test results were used as a way to gain research data. It was conducted by field-monitoring, making notes, and analyzing things to gain research data such as cognitive, affective, and or psychomotor. The paper of conducted learning processes is the data gaining instrument. Data research gaining through testing was conducted by giving instruments consisting of essays to fill which depicts students' ability to think reflective, especially on the cognitive aspect.

2.3 Data Analysis Technique

Data analysis techniques which are used are: (1) testing the instrument using reliability and validity testing, (2) testing the assumption through normality and homogeneity [17], and (3) testing the hypothesis using parametric statistic or statistic of non-parametric by considering the assumption test. There are two steps of validity testing; those are logic validity (expert judgment) and empirical validity [18], [19]. Alpha Cronbach was used as the instrument of reliability testing.

3 Results

3.1 Description of the Research Process

In this pandemic of COVID-19, we are forced to conduct e-learning, a concept or media that we call as studying from home. This research, in relation to the process of e-learning, uses the online platform such as WhatsApp and zoom. The experiment and the control classes are grouped into two e-learning classes, facilitated with the WhatsApp group and zoom application. Every e-learning class consists of students as a research subject, 2 observers, teacher class, and the researchers. The observer assesses the learning process that has been designed or planned. Researchers and the teacher class are the agents who take full responsibility for the process of teaching and learning in the class.

Before the teaching and learning process was conducted, both e-learning classes (class A as the experimental and class E as the control class) were treated with the essay as the pre-test which is based on students' ability to think reflective. It was given to reveal the mathematical reflective thinking ability before the treatment. Table 1 reveals the mean score of the pre-test from both e-learning classes.

Table 1. Mean score of the pre-test of the e-learning classes

	Experiment Class	Control Class
Score	65,1	72,36
Criteria	Fair	High
Amount of students	30	31

The pre-test shows us that the control class possesses a better ability to think mathematical reflective than the experimental class. The experimental class is in fair criteria; meanwhile, the control has a high score. This is interesting since the experimental class will be treated by using a computer-based drilling learning model. Picture 1 is an example of a student's answer in the experimental class.

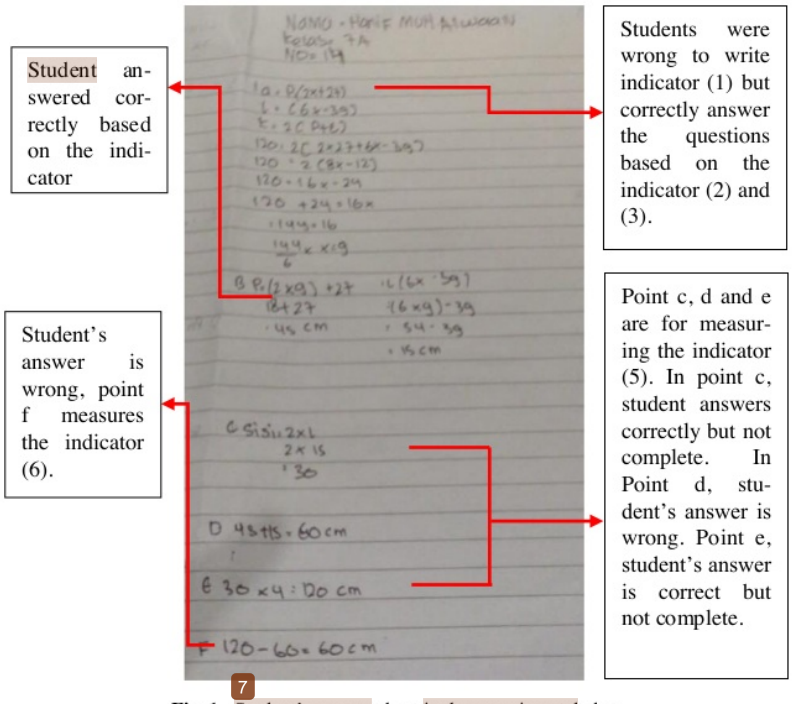

Fig. 1. Student's answer sheet in the experimental class

The answer to the mathematical problems in the experimental class in figure 1 depicts that students make errors in some indicators of mathematical reflective thinking abilities. Few of them answered closely to correct, but not complete to write the answer. This becomes our consideration since in the e-learning, before the treatment, most errors are produced during answer the question or solve the problems. It is confirmed by the mean scores of the pre-test in the experimental class as much 65,1 in which it is in the fair category.

Figure 2 depicts us the answer to the student's answers from the control class, it is clearly seen that students in this class are better than other students in the experimental class in answering the pre-test. See that there are 7,26 different points better than the experimental class. The student's pre-test answers are wrong only on indicator (1) and (6) as follows:

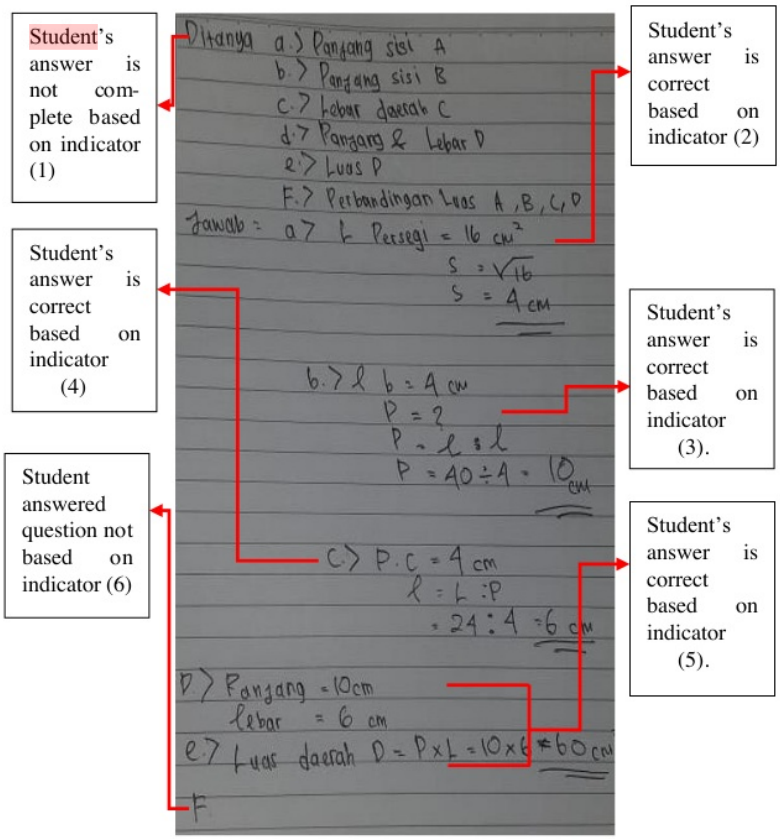

Fig. 2. Pre-test answers of the student of the control class

After the pre-test, both classes of experimental and control would be treated differently. In the experiment, in the process of learning, students will get the learning steps based on the syntax drill model which based on the computer. Meanwhile, the control class will be treated based on the conventional syntax model in the process of learning. The process of learning in both classes used the e-learning through WhatsApp and zoom. It is our consideration that the process of learning would be observed by two observers to guarantee the quality process of teaching and learning. Table 2 depicts the mean percentage of teaching and learning in experimental and control classes.

Table 2. The Mean of Learning Implementation

	Learning Model	
	Computer-Based Drill Model	Conventional Model
Mean Scores	96, 73%	93,33%

Table 2 reveals the implementation of teaching based on the drilling model supported by computer is higher than the conventional one. It happens because the conventional model employs the teacher as the center of teaching and learning processes. Figure 3 is the computer display that supports the drilling model of teaching activities.

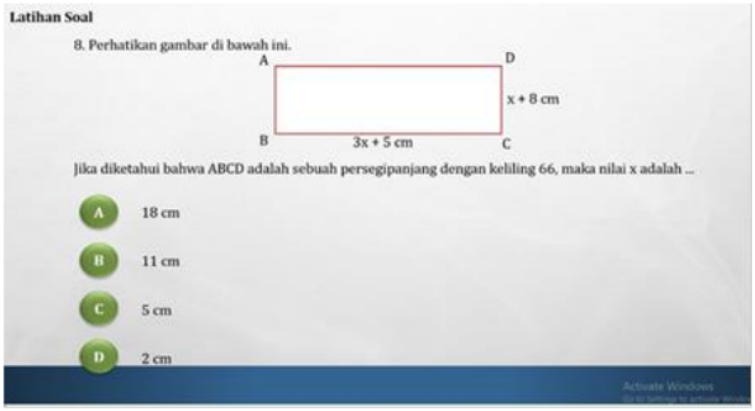

Fig. 3. Computer display of the drilling model

Figure 3 displays the question of students' computers using the drilling learning model, it is the multiple choices. Students are encouraged to finish the mathematical problems structurally and measurable based on mathematical reflective thinking abilities.

The post-test is the second step to reveal the differences between control and experiment classes. The post-test employs the 4 essays which measure the mathematical reflective thinking abilities. The researchers picked the essay to explore students' abilities in Math. Table 3 depicts the mean scores of both e-learning classes.

Table 3. Mean Scores of the e-learning post-test

	e-learning classes	
	Experimental Class	Control Class
Scores	79,63	68,56
Criteria	High	Fair
Amount of students	30	31

The result of the post-test is the reverse of the pre-test. In the experimental class, the score increases from the pre-test to the post-test and it is high. The control class, it decreases from pre-test to the post-test and it is fair.

3.2 Research Instrument Analysis

The pre-test and the post-test were validated before they are used for this research. Two steps are employed to validate the pre-test and post-test, those are the logic and empirical validations. Instrument logic validity was conducted based on the expert's consideration related to the instrument that has been designed. It is resulted in the validity of the pre-test and post-test essays to measure students' validity and reflectivity. It can be used with less revision. Empirical validity was gained through the momentum of product correlation as shown in the below table 4.

Table 4. Empirical Validity Result of the Pre-test and Post-test Material

Number	Pretest	Criteria	Postest	Criteria
1	0,603	Valid	0,737	Valid
2	0,840	Valid	0,888	Valid
3	0,809	Valid	0,857	Valid
4		-	0,877	Valid

It is found that 3 essays of the pre-test and 4 essays of the post-test that have been tested and counted for the momentum product correlation are all valid. Then, the essays that are valid would be reliability tested using Alpha Cronbach. Table 5 below is the result of the reliability testing calculation of the pre-test and the post-test.

Table 5. Pre-Test and Post-Test Material Reliability Test

	Pretest	Postest
CronbachAlpha	0,614	0,847
Internal Consistency	acceptable	Good

The pre-test material is in the category of acceptable, and the post-test is at one level higher, it is good. Tables 4 and 5 of the pre-test and the post-test depict us that they are qualified for validity and reliability, meaning that the instruments can be used to measure students' ability to think reflectively.

3.3 Prerequisite Test (Assumption)

On behalf of the data variant from the data samples that are used in the research, we need to conduct the homogeneity test, it uses the Levene's Test. Table 6 below reveals the result of the homogeneity test.

Table 6. Homogeneity Test Result

Levene Statistic	Sig.
2,544	0,117

On table 6, it gains the sig. values 0,117 > 0,05 which makes the experimental and control classes are homogeny. It means that the students' ability for reflective thinking between experimental and control groups are not different statistically. It enables us to treat them differently in the learning model testing.

The second prerequisite is the data normality testing, it employs Kolmogorov Smirnov Testing. Table 7 below reveals us the result of gain data of normality testing.

Table 7. Normality Testing Result

Class	Kolmogorov-Smirnov		
	Statistic	Df	Sig.
Experimental	,234	26	,001
Control	,184	27	,019

Table 7 reveals Sig values. The experimental and control classes gain 0,01 and 0,19. If it is compared to the alpha value of 0,05, it gains sig<0,05 which means that H0 is refused. It can be concluded that the data experimental and control classes are not normally distributed. The next is the testing effectiveness model of drilling learning with computer-based using statistics of non-parametric.

3.4 Hypothesis Testing

In this part, the online effectiveness testing towards the computer-based drilling and the conventional model was conducted. Since the distributed data is not normal, then the testing would be conducted using non-parametric statistics with the method of ranking testing marked by the Wilcoxon Signed Ranks Test. The pre-test and post-test data results are used to t-test the effectiveness of both online classes.

Table 8. The result of effectiveness testing of the computer-based drilling learning model

Wald-Wolfowitz Test	Posttest – Pretest
Z	-2,403
Asymp. Sig. (2-tailed)	,016

Table 8 reveals to us that the Z value is -2,403 since the Z is in the area of H0 refusal. It can be concluded that the drilling model of computer-based is effective for mathematical reflective thinking ability. Table 9 reveals to us the result of Wald-Wolfowitz's result in the control class.

Table 9. Hasil uji keefektivan pembelajaranmodel konvensional

Wald-Wolfowitz Test	Posttest – Pretest
Z	-1,229
Asymp. Sig. (2-tailed)	,219

Table 9 shows a Z value of -1.2229, in the H0 region so that it rejects H1, which means that the conventional model is not effective against mathematical reflective thinking abilities. It can be seen that after the treatment of different learning models give different impacts. In the experimental class, suing the computer-based, resulted in the effectiveness. On the other hand, it is not the same as the conventional learning model.

4 Discussion

The result of the pre-test on the experimental class reveals to us that the mean score of reflective thinking is 65,1 in which it is a fair position. The pre-test depicts the students' ability to think reflectively using face to the face learning model. The result of the post-test of the experimental class reveals the score as much 79,63 with the high category. As a matter of fact, the result of the post-test reveals successfulness using the computer-based drilling model through the online class. As has been shown by the previous research that the drilling model is effective [7]–[9], [20]–[25]. The basic different finding is that the model being employed in this research is online media. It indicates that the drilling model is effective to be used both online and face to face classes. However, some research proves that the drill is not better than the team assisted the individualization learning model and the use of GeMA Method [26], [27]. However, the team assisted individualization is higher due to the less support of the computer or online media.

The result of the mean score of the pre-test related to the mathematical reflective thinking ability is 72,36 with the category of high. That result is the conventional model or face to face classroom activity. It is also shown by the previous research which stated that the conventional model would be effective and efficient and can develop the mathematical learning success [11], [28], [29]. However, the post-test result on the control class reveals the otherwise result. After it has been treated conventional learning via online, it reveals the decreasing score of reflective thinking as much 68,56 of the fair category. It depicts us the online conventional learning is not effective to develop the ability to think reflective mathematics. Together with that fact, the previous research reveals that the conventional model is not better than the inquiry [17], [30].

The computer-based drill model would be effective if it is conducted with the online system due to the teacher-centered. Teachers are more on the facilitator in the process of learning. It is expected that students would get a better understanding of Math during the teaching and learning process. The model of conventional is the teacher-centered; it requires the face to face and direct teacher demonstration. If it is conducted online, it finds obstacles due to teacher's difficulties in attaching students.

5 Conclusion

The computer-based drill learning model by considering the effective learning steps would be able to develop students' mathematical reflective thinking. This com-

puter-based learning matches to be used in this pandemic of Covid-19. However, the conventional learning model which is conducted online would not be effective to develop students' ability to think reflective since the conventional is fit to be conducted face to face.

6 Recommendations

In this pandemic of Covid-19, teachers are expected to develop the ability to teach online, due to the government restriction to conduct the ordinary face to face classroom. One of the alternative models of online learning is the computer-based learning model. Teachers are also able to develop the computer-based drill model which is cooperative learning to attain the learning goals.

7 Acknowledgment

We are grateful to the experts for their appropriate and constructive suggestions to improve this template. Universitas PGRI Yogyakarta and LPPM have facilitated the authors to conduct and complete this research. The principal of SMP Muhammadiyah 3 Yogyakarta who gave permission and place to the author to carry out this research. And, for all those people who generously gave of their time and insights during the writing process And, for all those people who helped in the writing process.

8 References

[1] C. W. Morfi *et al*., "Kajian Terkini Coronavirus Disease 2019 (COVID-19) [Coronavirus Disease 2019 (COVID-19) Recent Studies]," *J. Ilmu Kesehat. Indones.*, vol. 1, no. 1, pp. 1–8, 2020. jikesi.fk.unand.ac.id/index.php/jikesi/article/view/13

[2] T. Nurhayati and R. H. S. Aji, "Emansipasi Melawan Pandemi Global: Bukti Dari Indonesia [Emancipation Against Global Pandemic: Evidence from Indonesia]," *ADALAH*, vol. 4, no. 1, pp. 81–92, 2020. https://doi.org/10.15408/adalah.v4i1.15468

[3] G. D. Rubin *et al*., "The Role of Chest Imaging in Patient Management during the COVID-19 Pandemic: A Multinational Consensus Statement from the Fleischner Society," *Chest*, no. May, pp. 1–11, 2020. https://doi.org/10.1016/j.chest.2020.04.003

[4] I. Syawfi, "Implikasi Pandemi COVID-19 terhadap Hubungan Internasional : Menuju dunia Paska-Liberal [Implications of the COVID-19 Pandemic for International Relations: Towards a Post-Liberal world]," *J. Ilm. Hub. Int.*, vol. Khusus, no. April, pp. 23–29, 2020. https://doi.org/https://doi.org/10.26593/jihi.v1i1.3864.23-29

[5] D. R. Buana, "Analisis Perilaku Masyarakat Indonesia dalam Menghadapi Pandemi Virus Corona (Covid-19) dan Kiat Menjaga Kesejahteraan Jiwa [Analysis of Indonesian People's Behavior in Facing the Corona Virus (Covid-19) Pandemic and Tips for Maintaining Mental Well-being," *SALAM J. Sos. dan Budaya Syar-i*, vol. 7, no. 3, 2020. https://doi.org/10.15408/sjsbs.v7i3.15082

[6] D. E. Barnett, "Online adjunct faculty: A quantitative examination of the predictive

relationship between leadership and job satisfaction," *Int. J. Res. Educ. Sci.*, vol. 4, no. 1, pp. 226–236, 2018. https://doi.org/10.21890/ijres.383159

[7] Y. Kurniawan, "Peningkatan kemampuan pemecahan masalah matematik siswa melalui pembelajaran dengan menggunakan metode drill [Improving students' mathematical problem solving abilities through learning by using the drill method]," *J. Penelit. Pendidik. dan Pengajaran Mat.*, vol. 2, no. 1, pp. 75–86, 2016. http://jurnal.unsil.ac.id/index.php/jp3m/article/view/Yun21

[8] L. Saparwadi, "Efektivitas Metode Pembelajaran Drill dengan Pendekatan Peer Teaching Ditinjau dari Minat dan Prestasi Belajar Matematika Siswa [The Effectiveness of Drill Learning Method with Peer Teaching Approach Judging from Students' Mathematics Interest and Achieve," *J. Didakt. Mat.*, vol. 3, no. 1, pp. 39–46, 2016. https://doi.org/10.24815/jdm.v3i1.4304

[9] N. Wahyuni, "Penggunaan metode drill dalam pembelajaran matematika [The use of drill methods in learning mathematics]," in *Prosiding Seminar Nasional*, 2013, vol. 02, pp. 399–406. http://journal.uncp.ac.id/index.php/proceding/article/view/576

[10] E. Kumalasari, "Perbedaan hasil belajar matematika siswa yang diajar dengan menggunakan metode drill dan ekspositori [Differences in student learning outcomes in mathematics taught by using drill and expository methods]," *J. Penelit. Pendidik. dan Pengajaran Mat.*, vol. 2, no. 1, pp. 21–28, 2016. http://jurnal.unsil.ac.id/index.php/jp3m/article/view/150

[11] I. San and A. Kis, "Effect of traditional methods in geometry and numbers learning domains on academic achievement: A meta-analysis study," *Int. J. Res. Educ. Sci.*, vol. 4, no. 2, pp. 544–554, 2018. https://doi.org/10.21890/ijres.428950

[12] K. E. Lestari and M. R. Yudhanegara, *Penelitian Pendidikan Matematika*. Bandung, Jawa Barat, Indonesia: PT Refika Aditama., 2017.

[13] D. A. Istikomah and P. Jana, "Mathematical Prolem Solving Ability in Apos Modified Learning Model (M-APOS)," *J. Phys. Conf. Ser.*, vol. 1254, no. 1, pp. 1–6, 2019. https://doi.org/10.1088/1742-6596/1254/1/012071

[14] J. Jaenudin, H. Nindiasari, and A. S. Pamungkas, "Analisis Kemampuan Berpikir Reflektif Matematis Siswa Ditinjau Dari Gaya Belajar [Analysis of Students' Reflective Mathematical Thinking Abilities Judged From Learning Styles]," *Prima J. Pendidik. Mat.*, vol. 1, no. 1, pp. 69–82, 2017. https://doi.org/10.31000/prima.v1i1.256

[15] E. Cener, I. Acun, and G. Demirhan, "The Impact of ICT on Pupils' Achievement and Attitudes in Social Studies," *J. Soc. Stud. Educ. Res.*, vol. 6, no. 1, pp. 190–207, 2015. https://doi.org/10.17499/jsser.67856

[16] H. Z. Sun-Lin and G. F. Chiou, "Effects of gamified comparison on sixth graders' algebra word problem solving and learning attitude," *Educ. Technol. Soc.*, vol. 22, no. 1, pp. 120–130, 2019. https://drive.google.com/open?id=1sEbYGokaatw-8AeLWbp5eZIspyu9ZGT9

[17] K. Salim and D. H. Tiawa, "Implementation of structured inquiry based model learning toward students' understanding of geometry," *Int. J. Res. Educ. Sci.*, vol. 1, no. 1, pp. 75–83, 2015. https://doi.org/10.21890/ijres.70396

[18] Ö. Korkmaz, M. Köstereliоğlu, and M. Kara, "A validity and reliability study of the engineering and engineering education attitude scale (EEAS)," *Int. J. Eng. Pedagog.*, vol. 8, no. 5, pp. 44–57, 2018. https://doi.org/10.3991/ijep.v8i5.8667

[19] Ö. Korkmaz and M. K. Korkmaz, "A Validity and Reliability Study of the Basic Electronics Skills Self-Efficacy Scale (BESS)," *Int. J. Eng. Pedagog.*, vol. 6, no. 4, p. 30, 2016. https://doi.org/10.3991/ijep.v6i4.6168

[20] C. Fransiska, R. Masykur, and F. G. Putra, "Analisis Kemampuan Pemecahan Masalah Matematis : Dampak Metode Drill ditinjau dari Gaya Belajar," *Desimal J. Mat.*, vol. 2, no. 2, pp. 131–140, 2019. https://doi.org/10.24042/djm.v2i2.4147

[21] A. Hadi, "Perbandingan Hasil Belajar Matematika Siswa yang Diajar Dengan Metode Drill dan Metode Ekspositori pada Kelas VII SMP Negeri 3 Makassar [Comparison of Student Mathematics Learning Outcomes Taught by Drill Method and Expository Method in Class VII of SMP N," vol. 2, no. 1, pp. 18–26, 2019. https://ojs.unsulbar.ac.id/index.php/pedamath/article/view/444

[22] H. Hermaniah, "Studi Perbandingan Pembelajaran Yang Menggunakan Metode Small Group Discussion Dengan Metode Drill Pada Mata Pelajaran Matematika Kelas III MIN Pemurus Dalam Banjarmasin," *Al Adzka J. Ilm. Pendidik. Guru Madrasah Ibtidaiyah*, vol. 7, no. 1, pp. 121–144, 2017. https://doi.org/http://dx.doi.org/10.18592/aladzkapgmi.v7i1.2025

[23] F. Artanti and T. K. Lestari, "MATEMATIKA SISWA DENGAN MENGGUNAKAN MODEL," in *Konferensi Nasional Penelitian Matematika dan Pembelajarannya II (KNPMP II)*, 2017, no. 18 Maret 2017, pp. 290–300. https://doi.org/10.31932/jpdp.v2i1.25

[24] S. Saprudin and F. Hamid, "Penggunaan Multimedia Interaktif Model Drill and Practice Materi Fluida Dinamis Untuk Meningkatkan Penguasaan Konsep Siswa Sekolah Menengah Atas (SMA) [Use of Interactive Multimedia Drill Models and Dynamic Fluid Material Practices to Enhance the Mastery ," in *PROSIDING SEMINAR NASIONAL FISIKA (E-JOURNAL) SNF2018*, 2018, vol. VII, pp. SNF2018-PE-144-SNF2018-PE-151. https://doi.org/10.21009/03.snf2018.01.pe.19

[25] A. E. Soponyono, K. Sinaga, and J. Seleky, "Perbandingan penerapan metode drill dan resitasi terhadap hasil belajar kognitif matematika siswa kelas XI IPA di SMA ABC Cikarang [A Comparison Of The Implementation Of Drill And Recitation Methods Toward Grade 11 Science Students' Cognitive Achievement," *JOHME J. Holist. Math. Educ.*, vol. 1, no. 2, pp. 81–92, 2018. https://doi.org/10.19166/johme.v1i2.795

[26] B. J. Tama, "Perbedaan Hasil Belajar Matematika Melalui Metode Team Assisted Individualization Dan Metode Drill," *J. SAP*, vol. 1, no. 3, pp. 322–332, 2017. https://doi.org/http://dx.doi.org/10.30998/sap.v1i3.1303

[27] F. A. Yudha, E. Azhar, and W. Wahidin, "Perbedaan kemampuan pemecahan masalah matematis siswa dengan menggunakan metode gema dan metode drill 1," in *Prosiding SENAMKU: Seminar Nasional Pendidikan Matematika UHAMKA*, 2018, vol. 01, pp. 191–204. https://journal.uhamka.ac.id/index.php/senamku/article/view/2758

[28] E. R. Dewi, "Metode Pembelajaran Modern Dan Konvensional Pada Sekolah Menengah Atas," *PEMBELAJAR J. Ilmu Pendidikan, Keguruan, dan Pembelajaran*, vol. 2, no. 1, p. 44, 2018. https://doi.org/10.26858/pembelajar.v2i1.5442

[29] I. Sakti, "Pengaruh Media Animasi Fisika dalam Model Pembelajaran Langsung (direct instruction) terhadap Minat Belajar dan Pemahaman Konsep Fisika Siswa di SMA Negeri Kota Bengkulu," *Pros. Semirata FMIPA Univ. Lampung, 2013*, vol. 1, no. 1, pp. 493–498, 2013. http://jurnal.fmipa.unila.ac.id/semirata/article/view/778

[30] P. Jana and E. Supiati, "Efektivitas model problem based learning ditinjau dari kemampuan pemecahan masalah matematika," *J. Mercumatika J. Penelit. Mat. dan Pendidik. Mat.*, vol. 3, no. 2, pp. 88–93, May 2019. https://doi.org/10.26486/jm.v3i2.745

9 Authors

Padrul Jana is a lecturer Department of Mathematics Education, Faculty of Teacher Training and Education, Universitas PGRI Yogyakarta. Jl. PGRI I No. 117, Sonosewu, 55182, Yogyakarta, Indonesia. Teaching and research activities on participating in the application and development of learning models. e-mail: padrul.jana@upy.ac.id

Nurchasanah is the researcher in the Department of Mathematics Education, Faculty of Teacher Training and Education, Universitas PGRI Yogyakarta. Jl. PGRI I No. 117, Sonosewu, 55182, Yogyakarta, Indonesia.

Article submitted 16 October 2017. Published as resubmitted by the authors 29 November 2017.

MANUSKRIP IJEP

ORIGINALITY REPORT

8%	2%	2%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universitas Negeri Surabaya The State University of Surabaya Student Paper	2%
2	Submitted to Universiti Teknologi MARA Student Paper	1%
3	garuda.ristekdikti.go.id Internet Source	1%
4	Submitted to University of Mosul Student Paper	1%
5	Dirk Hoek, Jan Terwel, Pieter van den Eeden. "Effects of Training in the Use of Social and Cognitive Strategies: An Intervention Study in Secondary Mathematics in Co-Operative Groups", Educational Research and Evaluation, 1997 Publication	1%
6	Submitted to State Islamic University of Alauddin Makassar Student Paper	1%

7	Submitted to Universiti Sains Malaysia Student Paper	1%
8	A Salido, D Dasari. "The analysis of students' reflective thinking ability viewed by students' mathematical ability at senior high school", Journal of Physics: Conference Series, 2019 Publication	<1%
9	ir.uiowa.edu Internet Source	<1%
10	Submitted to Leeds Trinity and All Saints Student Paper	<1%
11	Submitted to Universitas Dian Nuswantoro Student Paper	<1%
12	Submitted to King Abdulaziz University Student Paper	<1%
13	cerid.org Internet Source	<1%
14	Poppy Yaniawati, Rahayu Kariadinata, Nenden Mutiara Sari, Euis Eka Pramiarsih, Mira Mariani. "Integration of e-Learning for Mathematics on Resource- Based Learning: Increasing Mathematical Creative Thinking and Self-Confidence", International Journal of Emerging Technologies in Learning (iJET), 2020 Publication	<1%

Exclude quotes	On	Exclude matches	< 10 words
Exclude bibliography	On		