

PAPER • OPEN ACCESS

## Mathematical Critical Thinking Ability: The Effect of Scramble Learning Model assisted by *Prezi* in Islamic School

To cite this article: Muhamad Yasin *et al* 2020 *J. Phys.: Conf. Ser.* **1467** 012007

View the [article online](#) for updates and enhancements.



**IOP | ebooks™**

Bringing together innovative digital publishing with leading authors from the global scientific community.

Start exploring the collection—download the first chapter of every title for free.

# Mathematical Critical Thinking Ability: The Effect of Scramble Learning Model assisted by *Prezi* in Islamic School

Muhamad Yasin<sup>1\*</sup>, Syamsul Huda<sup>1</sup>, Komarudin<sup>2</sup>, Suherman<sup>2</sup>, Reni Septiana<sup>2</sup>, Endah Kinarya Palupi<sup>3</sup>

<sup>1</sup>Institut Agama Islam Negeri Kediri, Indonesia

<sup>2</sup>Universitas Islam Negeri Raden Intan Lampung, Indonesia

<sup>3</sup>Faculty of Mathematics and Science, Institut Pertanian Bogor, Indonesia

\*[yasinmuhammad106@yahoo.com](mailto:yasinmuhammad106@yahoo.com)

**Abstract.** This study aims to determine the effect of scramble learning models assisted by *prezi* on mathematical critical thinking skills. The type of research used was quasi-experimental design. Data collection was performed by tests of mathematical critical thinking skills. Data were analysed using one-way ANOVA test and continued with multiple comparisons. Hypothesis testing used one way ANOVA with a significance level of 5%. The result of hypothesis test showed F count is 3.24 and F table is 3.10 or F count is greater than F table, then, hypothesis 0 is rejected. This study found that the average score of the class using scramble learning model assisted by *prezi* was higher than the class that used scramble learning model and conventional learning model. Based on these results it can be concluded that there is an influence of the scramble learning model assisted by *prezi* on the mathematical critical thinking ability of grade VII.

## 1. Introduction

Mathematics is an important subject on education, the paradigm in learning mathematics has an impact on the emphasis on changes the learning process [1]. Studying mathematics is important because in our daily lives we must not escape of mathematics. Mathematics also able to develop an awareness of essential values [2], [4]. Based on some of these, opinions indicate the importance of mathematics in everyday life [5], and it cannot be denied that many other sciences that developed with the help of mathematics, such as technology and physics [6]. Besides that, one of the goals of mathematics learning is mainly to help students solve difficult mathematical problems [7].

The problems faced by a person will become more complex as the age and social environment develops. To be able to survive, a person needs to have critical thinking skills [8]. Critical thinking is a process of making reasonable decisions. Critical thinking in mathematics is the ability and disposition that involves prior knowledge, mathematical reasoning, and using cognitive strategies in generalizing, proving, or evaluating mathematical situations that are less well known by reflective means [9]. Facion revealed four main indicators of mathematical critical thinking ability, namely interpretation, analysis, evaluation, and inference [10]. These indicators can be seen in Figure 1.



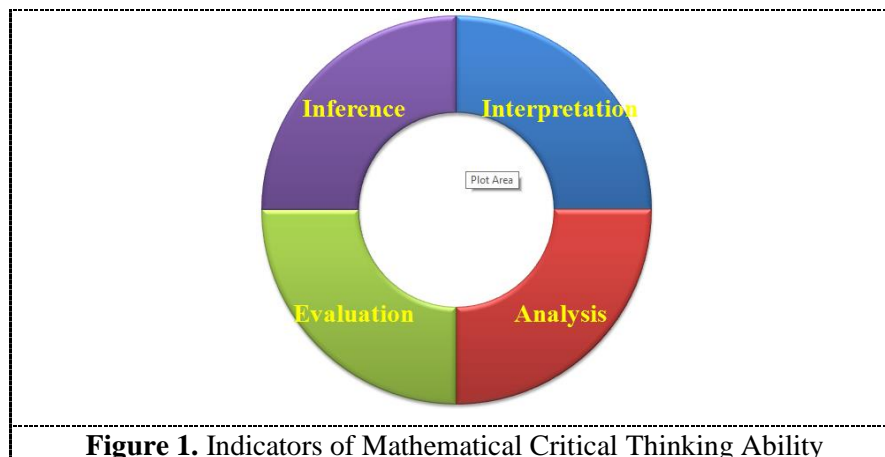


Figure 1 shows four indicators of mathematical critical thinking ability. The first, Interpretation, understanding the problems raised by writing known or asked questions correctly; second, Analysis, identifying the relationships between statements and concepts given in the problems indicated by making a model mathematics and giving explanations correctly; third, Evaluation, using the right strategy in solving problems, complete and correct in doing calculations; and fourth, Inference, making conclusions [11].

Several studies have found that the ability to think critically mathematically is not in accordance with what is expected, including the Junior High School students [7]. In many cases, students have not been able to transform sentences into mathematical models and lack mastery of applied concepts [12]. Although some researchers state that in research conducted by Zavy, students can write concepts by writing symbols correctly [13]. Several studies [7], [14], [15] report that mathematical critical thinking skills are not yet high.

One of the learning model that is predicted to be able to influence the students' mathematical critical thinking ability is a scramble learning model assisted by prezi. Prezi is a software to create a presentation with very interesting animation features [16]. The advantage of this software is prezi has a ZIU facility that allows the canvas to be scaled down, enlarged, or rotated by 360 degrees which allows the user to not move to another slide. Besides, the prezi software flash files, power points, and pdfs can be inserted which support the ease of compiling presentation slides [17].

Based on several studies that have been conducted, scramble learning models can have a good influence on learning outcomes [18]-[22], higher order thinking skills [23], and mathematical problem solving abilities [24]. Prezi in several studies also mentioned can influence the learning outcomes [25]-[28], the ability to remember concepts [29], and interest in learning mathematics [30]. However, there are no studies that apply scramble learning models to the ability to think critically mathematically assisted by prezi. The advantage of the scramble learning model lies in the learning process which emphasizes more active students, the learning process with the teacher as a facilitator, mediator, and evaluator. Students are required to work together with their groups, so that requires interaction that is built by students who will be exchanging opinions [31]. With this learning process, students are expected to be motivated and develop their mathematical critical thinking skills [32]. The findings certainly need to be supported by research to examine the effect of scramble learning models assisted by prezi on the ability to think critically mathematically on students.

## 2. Method

The type of research used in this study was quantitative research with a quasi-experimental method. The subject of this study was grouped into three groups, the first group is the students who received treatment of learning models with prezi scramble learning. The second group is the students who received treatment learning scramble learning models. While the third group is the students who get treated with conventional learning models [33].

The population in this study were students of class VII with a sampling technique using probability sampling. The sample in this study used three classes, class VII-5 as experimental class 1 which contained 31 students, VII-5 as experimental class 1 which contained 32 students, and class VII-7 as a conventional class contained 32 students. The indicator of learning model based on collection data from the post-test. The design of this study was carried out in three classes. Figure 2 below shows the design of this research.

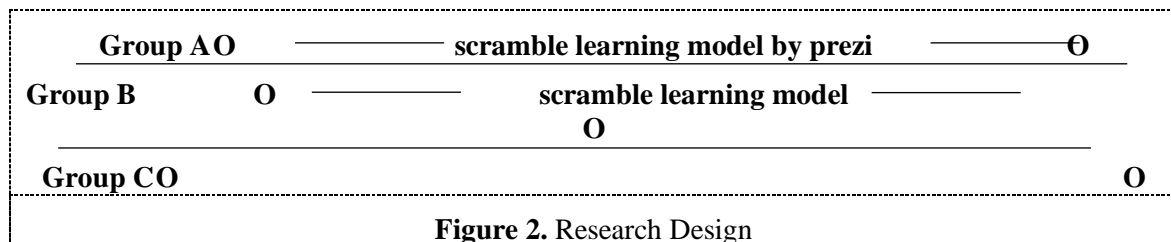
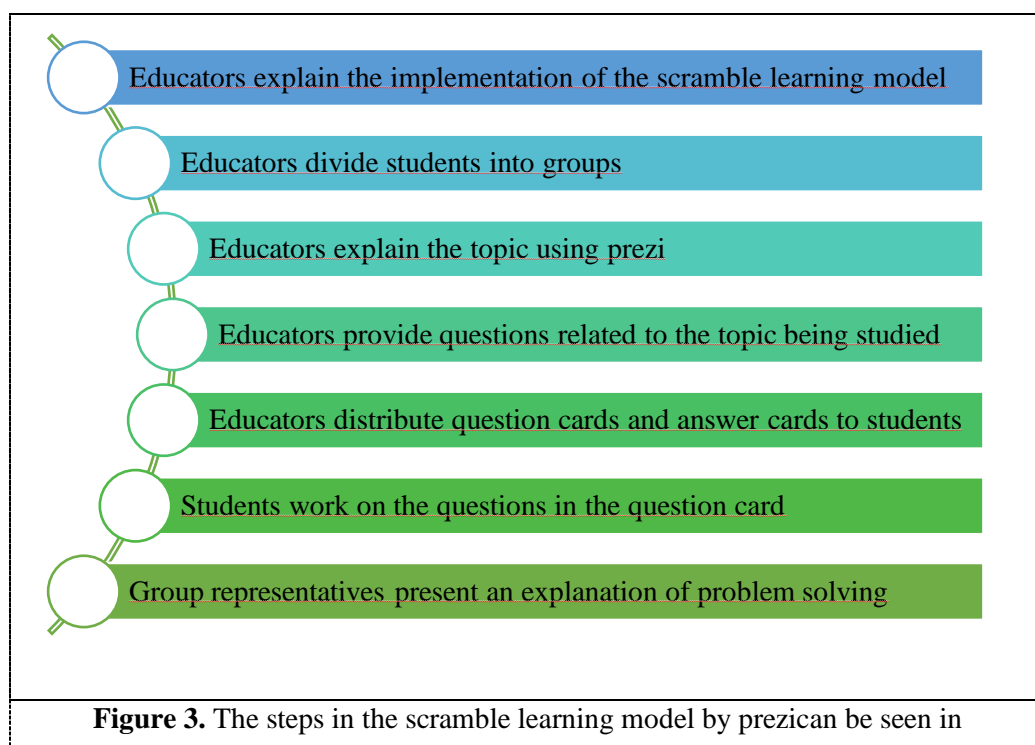


Figure 2 shows us the design of this research. Group A VII-5 as experimental class 1, group B is VII-5 as experimental class 1, group C is class VII-7 as a conventional class. The testing of hypothesis used one-way ANOVA test and continued with the double comparison test.



The first step, educators explain the implementation of the scramble learning model in which students are required to be active and answer the questions listed in the question cards systematically and sort them with the appropriate answers. The second step, educators divide students into groups consisting of 5 to 6 students. The third step, educators explain learning material using prezi. The fourth step, educators provide questions to students regarding material that has just been studied. The fifth step, educators distribute question cards and answer cards to each group for discussion. The sixth step, students discuss to solve the existing problems with the time determined by the educator, for groups who finish quickly and correctly will be given additional points. The seventh step, group representatives present the results of problem solving by discussion, then students and educatorstogether formulate conclusions related to the topic being studied [34].

### 3. Results and Discussion

After the students' mathematical critical thinking ability data on rectangular and triangular material was collected, both from the experimental class and the control class obtained the highest value, the lowest value in all three classes, and sought a measure of central tendency through the average range, median, and mode which can be summarized in Table 1.

**Table 1.** Observations of Students' Mathematical Critical Thinking Ability

Class	Ideal Value	Highest Value	Lowest Value	Measuring Central Tendency		
				Average Range	Median	Mode
<b>Experiment 1</b>	100	99	41	72	73	53, 69, 70, 72, 88 and 93
<b>Experiment 2</b>	100	91	35	68	70	35, 60, 65 and 69
<b>Control</b>	100	90	25	62	60	56 and 69

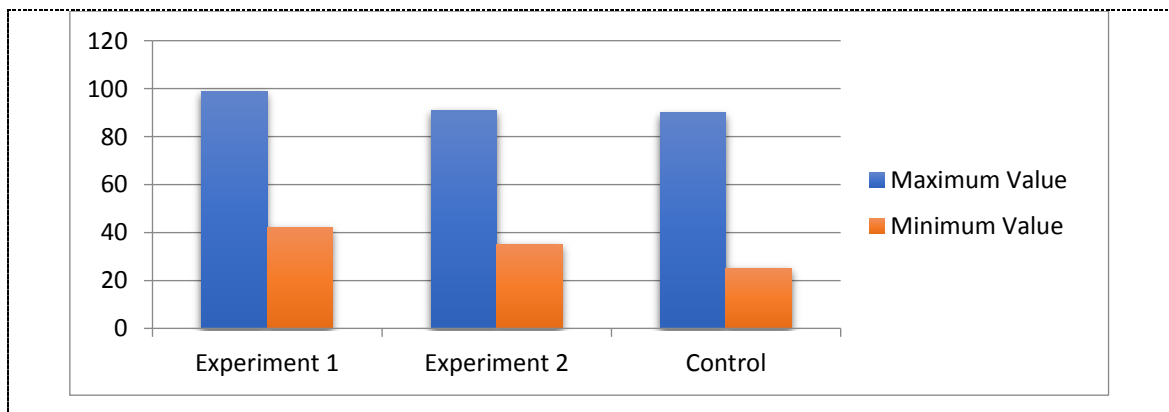
Based on Table 1, experimental class 1, the class with scramble learning model by prezi, with the ideal value of 100 obtained the highest value of 99, while in the experimental class 2, the class with scramble learning model obtained a value of 91, and in the control class, the class with models conventional learning has the highest post-test value of 90. The success of this method can be seen from the average value obtained from each class (learning model). From the three classes, which have the highest average value is the experimental class 1, the class with scramble learning models by prezi

ANOVA one way test is conducted to find out the presence or absence of the influence of the three samples, also needs to be tested for normality using the *Liliefors* method and homogeneity test using the *Bartlett* test. After processing the data with normal and homogeneous distribution, the researchers then conducted an ANOVA one way test. ANOVA one way test are presented in Table 2.

**Table 2.** ANOVA Table for the success of the scramble learning model by prezi on the ability to think critically mathematically

Source	SS	d	MS	F	F table
Learning model (A)	1,376.23	2	688.11	3.24	3.10
Error (E)	18,499.87	87	212,64		
Total (T)	19,876.1	89			

Table 2 shows the ANOVA table the success of the scramble learning model by prezi on the ability to think critically mathematically seen that  $F$  is 3.24 and the level of significance 5% obtained  $F$  table is 3.10, noted that  $F$  greater than  $F$  table, then hypothesis is rejected. It means that there is an influence of learning models on students' mathematical critical thinking skills, between those who obtain scramble learning assisted by prezi, scramble learning models, and conventional learning models [35]. After that, to see which learning model significantly influences the mathematical critical thinking ability, an advanced ANOVA test is performed. Mathematical critical thinking ability test scores of students in the experimental class and the control class are in Figure 4.



**Figure 4.** The results of the maximum and minimum values obtained by all three classes

Figure 4 illustrates the maximum and minimum values obtained by all three classes. Educators in each class test the students' mathematical critical thinking skills. There were 5 learning meetings, namely 4 meetings of the teaching and learning process, and 1 meeting was an evaluation of students' learning as research data collection. The number of students from all three classes was 95 participants, the experimental class 1 was a class with a scramble learning model by prezi model of 31 participants. Experimental class 2 is a class with 32 participants in scramble learning model. As for the control class with a conventional learning model totaling 32 participants. The results showed that the highest value was obtained by the experimental class 1, scramble learning model by prezi, while for the lowest value obtained by the control class by conventional learning model. These results support previous research [36].

Advance ANOVA test with the Scheffe method 'to find out the significant effect between the three samples available in Table 3.

**Table 3.** Advance ANOVA Test Table

Double Comparison	F	F table	Conclusion
Scramble learning model by prezi vs scramble learning models	186.49	6.2	Hypothesis is rejected
Scramble learning models vs conventional learning models	6,341.64	6.2	Hypothesis is rejected
Scramble learning model by prezi vs conventional learning models	8,543.42	6.2	Hypothesis is rejected

Table 3 illustrates that the mathematical critical thinking skills of students who receive the scramble learning model by prezi with scramble learning models where students who receive the scramble learning model by prezi vs with scramble learning models obtained that  $F$  is 186.49 and  $F$  table is 6.2. Based on the results of these calculations it appears that  $F$  greater than  $F$  table then hypothesis is rejected. This means that there is a significant influence on students' mathematical critical thinking abilities on the scramble learning model by prezi and with a scramble learning model. Based on the average value of students with scramble learning models by prezi has an average value of 72. While students using scramble learning models have an average value of 68. So, it can be

concluded that the scramble learning model by prezi is better than scramble learning model. Scramble learning model is a learning model where the educator prepares question cards and answer cards and distributes them to each group after that the students together with each group solve problems in the question cards that have been provided and choose the right answers that have been provided by educators on the cards answer [37]. In the experimental class, the scramble learning model by prezi, the students seem to pay attention to the material given well, and while the question session the students look active to answer the questions given by the educator. In line with the findings made by Hernita found that internet-based presentations in addition to attracting students in learning, prezi makes it easier to deliver material, especially in mathematics learning [38] also research conducted by Yanti, the use of prezi encourages students to be active in thinking, can develop courage and skills in expressing opinions and provide opportunities to ask questions about things that are still not understood [39]. So that in working on the question card and answer card students have mastered the material well and are able to apply steps to answer questions about the ability to think critically mathematically systematically.

The findings of this study are similar to the findings of other studies, classes using innovative media-assisted learning models are better than classes that only use innovative learning models [28], [40]. In this study the scramble learning model assisted by the prezi media influences the ability to think critically mathematically, this is because the presence of the prezi media will support students in paying attention to the material and actively participating in the learning process. In line with the results of research conducted by Rais, that the use of multimedia prezi learning presentations gives a better influence on the ability to remember concepts [40]. This research is different from other studies in the use of instructional media [41-42].

Table 3 illustrates that the mathematical critical thinking skills of students who receive the scramble learning model by prezi with scramble learning models where scramble learning model by prezi VS scramble learning models obtained that  $F$  is 6,341.64 and  $F$  table is 6.2. Based on the results of these calculations it appears that  $F$  greater than  $F$  table then hypothesis is rejected. This means that there is a significant influence between students' mathematical critical thinking abilities using the scramble learning model and conventional learning models. Based on the average value of students using the scramble learning model has an average value of 68, while the conventional learning model class has an average value of 62. Thus, the scramble learning model is better than the conventional learning model [42].

In the experimental class scramble learning model, educators explain the material in front of students. It appears that students are active in discussing with the group when solving the questions listed on the question card, but students are still a little confused and ask for a re-explanation of how to answer the questions on the question card [43].

The findings of this study are similar to other research findings, namely the class using scramble learning models has better results than conventional learning model classes [20], [44]. In the study of scramble learning models students are required to actively discuss with members of their groups to find the right and systematic answers by matching question cards and answer cards.

Table 3 also illustrates that the mathematical critical thinking skills of students who receive the scramble learning model by prezi with conventional learning models, scramble learning model by prezi VS conventional learning models obtained that  $F$  is 8,543.42 and  $F$  table is 6.2. Based on the results of these calculations it appears that  $F$  greater than  $F$  table then hypothesis is rejected. Then, there is an influence between the students' mathematical critical thinking skills using scramble learning model by prezi and using conventional learning models [45]. It is seen that the average value of the experimental class is 72 while the control class using conventional learning models has an average value average 62.

Based on the double comparison of the three classes, it was found that the students' mathematical critical thinking skills got the best results in the class that was applied scramble learning model by prezi [46]. The results illustrate that students' mathematical critical thinking skills in experimental class one are classes that get treated using the scramble learning model by prezi higher than the experimental class using scramble learning models and control classes using conventional learning

models. This can be seen from the posttest average mathematical critical thinking ability which has the highest average [47].

The results of this study are similar to other studies that the scramble learning model has an influence on critical thinking skills [48]. In the research that has been done, the researcher observed the learning of grade VII students while working on the post-test in the class that was applied to the scramble learning model by prezi, the children's critical thinking skills improved [49]. In the ability to think critically mathematically write indicators that are known and asked, analyze concepts, write answers systematically and provide conclusions [50]. This finding is in line with the nature of mathematics which can substantially encourage the development of mathematical thinking abilities. Because mathematical concepts are arranged hierarchically, structured, logical, and systematically starting from the simplest concepts to the most complex concepts that require good mathematical thinking ability to overcome them [51].

The most difficult indicator of mathematical critical thinking ability is about writing mathematical concepts, another factor that greatly influences student learning success in mastering mathematical concepts [52]. This finding is in line with researchers' findings [53]. The low understanding of the concept is characterized by some students who have not been able to choose procedures or operations that are in accordance with the question of the story, students have difficulty in solving problems that are slightly different from the example and students lack understanding in determining things that are known in the question of the story [54]. In the ability to think critically mathematically, the ability to write a concept is a crucial ability to continue how the solution is appropriate and appropriate.

#### 4. Conclusions

Based on the whole series of research, starting from the planning, implementation, to the data analysis and hypothesis testing stages, it can be concluded that there is an influence of the scramble learning model assisted by prezi on the mathematical critical thinking ability of grade VII. The following explanation: Students treated with scramble learning model assisted by Prezi had a better mathematical critical thinking ability than students treated with scramble learning model. Students treated with scramble learning model assisted by prezi had a better mathematical critical thinking ability than students treated with conventional learning models. Students treated with scramble learning models had a better mathematical critical thinking ability than students taught with conventional learning model.

Scramble learning model assisted by prezi can be used as an alternative to help students to be more motivated and active during learning process. The next researcher is expected to be able to use scramble learning model assisted by prezi to improve mathematical critical thinking skill, especially for students who have low mathematical critical thinking skill, as well as develop other aspects of mathematical ability in the learning process.

#### References

- [1] M. Mujib and M. Mardiyah 2017 Kemampuan Berpikir Kritis Matematis Berdasarkan Kecerdasan Multiple Intelligences *Al-Jabar J. Pendidik. Mat.* **8** 2 187–196.
- [2] V. T. Anggraeni, S. Utama, and S. Samino 2014 Dampak Komunikasi Siswa Terhadap Hasil Belajar Matematika Sekolah Dasar *J. VARIDIKA* **26** 1 69–76.
- [3] N. Nursafitri, N. Handayani, M. Mayasari, and R. Amelia 2018 Menganalisis Kemampuankoneksi Matematis Pada Materi Bangun Datar Siswa Smpn Di Bandung Barat,” *J. Pendidik. Tambusai* **2** 6 1820–1828.
- [4] R. E. F. Siagian 2015 Pengaruh Minat dan Kebiasaan Belajar Siswa terhadap Prestasi Belajar Matematika *Form. J. Ilm. Pendidik. MIPA* **2** 2.
- [5] I. W. E. Mahendra 2017 Project based learning bermuatan etnomatematika dalam pembelajar matematika *JPI (Jurnal Pendidik. Indones.* **6** 1 106–114.
- [6] N. M. Sunilawati, N. Dantes, and I. M. Candiasa 2013 Pengaruh model pembelajaran kooperatif



- tipe STAD terhadap hasil belajar matematika ditinjau dari kemampuan numerik siswa kelas IV SD *PENDASI J. Pendidik. Dasar Indones.* **3** 1.
- [7] R. Mahmuzah 2015 Peningkatan Kemampuan Berpikir Kritis Matematis Siswa SMP Melalui Pendekatan Problem Posing *J. Peluang* **4** 1.
- [8] N. Happy and D. B. Widjajanti 2014 Keefektifan PBL Ditinjau Dari Kemampuan Berpikir Kritis dan Kreatif Matematis, Serta SELF-ESTEEM SISWA SMP *J. Ris. Pendidik. Mat.* **1** 1 48–57.
- [9] I. H. Abdullah 2016 Berpikir Kritis Matematis *Delta-Pi J. Mat. dan Pendidik. Mat.* **2** 1.
- [10] A. Martyanti and S. Suhartini 2018 Etnomatematika: Menumbuhkan Kemampuan Berpikir Kritis Melalui Budaya Dan Matematika *IndoMath Indones. Math. Educ.* **1** 1 35–41.
- [11] K. Normaya 2015 Kemampuan Berpikir Kritis Siswa dalam Pembelajaran Matematika dengan Menggunakan Model Jucama di Sekolah Menengah Pertama *J. Pendidik. Mat. FKIP Univ. Lambung Mangkurat* **3**.
- [12] U. Khasanah 2015 Kesulitan menyelesaikan soal cerita matematika pada siswa SMP.
- [13] N. Z. Sulthani, E. Hidayanto, and A. W. Yanti 2012 Kemampuan Komunikasi Matematis Siswa Kelas Unggulan dan Siswa Kelas Reguler Kelas X SMA Panjura Malang Pada Materi Logika Matematika *Online Univ. Negeri Malang*.
- [14] L. D. Haeruman, W. Rahayu, and L. Ambarwati 2017 Pengaruh model discovery learning terhadap peningkatan kemampuan berpikir kritis matematis dan self-confidence ditinjau dari kemampuan awal matematis siswa SMA di Bogor Timur *JPPM (Jurnal Penelit. dan Pembelajaran Mat.)* **10** 2.
- [15] T. Tresnawati, W. Hidayat, and E. E. Rohaeti 2017 Kemampuan Berpikir Kritis Matematis dan Kepercayaan Diri Siswa SMA *Symmetry Pas. J. Res. Math. Learn. Educ.* **2** 2 39–45.
- [16] Y. Antika and B. Suprianto 2016 Pengembangan Media Pembelajaran Berbasis Prezi Sebagai Upaya Meningkatkan Hasil Belajar Siswa Kompetensi Dasar Aplikasi Rangkaian OP AMP Mata Pelajaran Rangkaian Elektronika di SMK NEGERI 2 Bojonegoro *J. Pendidik. Tek. Elektro* **5** 2.
- [17] E. Epinur, S. Wilda, and A. Andriyani 2014 Pengembangan Media Pembelajaran Kimia pada Materi Elektrokimia untuk Kelas XII SMA N 8 Kota Jambi dengan Menggunakan Software Prezi *J. Indones. Soc. Integr. Chem.* **6** 1.
- [18] M. Ariyanto 2016 Peningkatan Hasil Belajar IPA Materi Kenampakan Rupa Bumi Menggunakan Model Scramble *Profesi Pendidik. Dasar* **3** 2 134 –140.
- [19] I. Bailang, J. Emor, and J. R. Wenas 2018 Penerapan Model Pembelajaran Kooperatif Tipe Scramble Terhadap Hasil Belajar Matematika Pada Materi Persamaan Linear Satu Variabel *JSME (Jurnal Sains, Mat. Edukasi)* **5** 2 132–137.
- [20] R. Diani, Yuberti, and S. Syafitri 2016 Uji Effect Size Model Pembelajaran Scramble dengan Media Video Terhadap Hasil Belajar Fisika Peserta Didik Kelas X MAN 1 Pesisir Barat *J. Ilm. Pendidik. Fis. Al-Biruni* **5** 2.
- [21] R. K. Hisan, N. Yuhelman, A. Abdullah, and E. Y. Amran 2017 Penerapan Model Pembelajaran Kooperatif Scramble untuk Meningkatkan Prestasi Belajar Siswa pada Pokok Bahasan Koloid di Kelas XI MA DAR El Hikmah *Perspektif* **1**.
- [22] M. Parinding and A. Lumbu 2015 Pengaruh Penerapan Model Pembelajaran Kooperatif Tipe Scramble Terhadap Minat dan Hasil Belajar Biologi Pada Siswa Kelas XI IPA SMA NEGERI I Manokwari *ridho* **3** 2.
- [23] R. Diani, A. Asyhari, and O. N. Julia 2018 Pengaruh model RMS (reading, mind mapping and sharing) terhadap kemampuan berpikir tingkat tinggi siswa pada pokok bahasan Impuls dan Momentum *J. Pendidik. Edutama* **5** 1 31–44.
- [24] N. P. D. P. Loka, I. M. Suarsana, and I. M. Sugiarta 2018 Pengaruh Model Pembelajaran

- Scramble Terhadap Kemampuan Pemecahan Masalah Matematika Siswa Kelas VII SMP Negeri 2 Pekutatan *J. Pendidik. Mat. Undiksha* **8** 2.
- [25] S. Hartini, M. Misbah, D. Dewantara, R. A. Oktovian, and N. Aisyah 2017 Developing Learning Media Using Online Prezi into Materials about Optical Equipments *J. Pendidik. IPA Indones.* **6** 2.
- [26] M. Mardiansyah, M. Syaiful, and M. Basri 2017 Pengaruh Media Presentasi Prezi Terhadap Hasil Belajar Siswa pada Mata Pelajaran Sejarah *PESAGI (Jurnal Pendidik. dan Penelit. Sejarah)* **5** 2.
- [27] T. Sutrisno 2013 Pengaruh Penggunaan Media Presentasi Online Prezi Oleh Guru Terhadap Hasil Belajar Siswa pada Mata Pelajaran IPA Melalui Model Pembelajaran Advance Organizer *Universitas Pendidikan Indonesia*.
- [28] P. Z. Zannah, D. Mulhayatiah, and F. Alatas 2014 Penggunaan Media Pembelajaran Zooming Presentation untuk Meningkatkan Hasil Belajar Ssiswa Kelas X Pada Konsep Suhu dan Kalor *Edusains* **6** 2.
- [29] M. Rais 2019 Pengaruh penggunaan multimedia presentasi berbasis prezi dan gaya belajar terhadap kemampuan mengingat konsep *J. MEKOM (Media Komun. Pendidik. Kejuruan)* **2** 1.
- [30] A. Alviyaturrohmah, S. Saluky, and A. Muchyidin 2017 Pengaruh Penggunaan Media Pembelajaran dengan Software Prezi Terhadap Minat Belajar Matematika Siswa *ITEj (Information Technol. Eng. Journals)* **2** 1.
- [31] N. N. Widiantari, H. Syahrudin, and I. W. Widiana 2013 Pengaruh Model Pembelajaran Scramble Berbantuan Media Video Terhadap Hasil Belajar IPA Siswa Kelas IV SD di Gugus V Kecamatan Buleleng *Mimb. PGSD Undiksha* **1** 1.
- [32] S. Syahrir, M. Syazali, R. Masykur, M. A. Amrulloh, H. J. Sada, and B. Listiani 2018 Calculus Module for Derivative Application Materials with an Islamic Contextual Teaching and Learning Approach *IOP Conf. Ser. J. Phys.* **1155**.
- [33] R. Maskur, M. Syazali, and L. F. Utami 2019 Islamic-Nuanced Calculus Module with Open-Ended Approach in Real Number System Material *J. Phys. Conf. Ser.* **1155** 1.
- [34] M. Syazali *et al.* 2019 Islamic-Nuanced Linear Algebra Module with Problem-Based Learning Approach for Linear Equation System Material *J. Phys. Conf. Ser.* **1155** 1.
- [35] A. A. Nugroho, R. W. Y. Putra, F. G. Putra, and M. Syazali 2017 Pengembangan Blog sebagai Media Pembelajaran Matematika *Al-Jabar J. Pendidik. Mat.* **8** 2 197–204.
- [36] Abdurrahman, A. Saregar, and R. Umam, 2018 Assessment Toward The Quantum Physics Concept Mastery Of The Prospective Physics Teachers *J. Pendidik. IPA Indones.* **7** 1 34–40.
- [37] S. Huda, I. Tsani, M. Syazali, R. Umam, and K. Jermisittiparsert 2020 The management of educational system using three law Auguste Comte : A case of Islamic schools *Manag. Sci. Lett.* **10** 3.
- [38] H. Hernita, M. D. Kurniasih, and H. Khusna 2018 Pengaruh Model Pembelajaran Kooperatif Tipe Think Talk Write (TTW) Berbantu Prezi terhadap Kemampuan Pemecahan Masalah Matematis Siswa di SMP Negeri 20 Jakarta *Pros. SENAMKU* **1** 343–351.
- [39] S. R. Yanti, R. Iriani, and B. Suharto 2018 Meningkatkan Hasil Belajar Siswa Melalui Model Quantum Learning Berbantuan Prezi Pada Materi Hidrokarbon Kelas X di SMA PGRI 6 Banjarmasin *J. Chem. Educ.* **2** 2 44–49.
- [40] M. Y. Rodhi 2014 Pengembangan Media Pembelajaran Berbasis Prezi untuk meningkatkan keterampilan Berpikir Kritis Pada Materi Kalor *Inov. Pendidik. Fis.* **3** 2.
- [41] N. L. N. Deviana, I. W. Wiarta, and K. N. Wiyasa 2017 Model Pembelajaran Kooperatif Tipe Scramble Berbantuan Bahan Manipulatif Berpengaruh Terhadap Kompetensi Pengetahuan Matematika *J. Educ. Technol.* **1** 2 133–140.

- [42] M. Syazali *et al.* 2019 Partial correlation analysis using multiple linear regression: Impact on business environment of digital marketing interest in the era of industrial revolution 4.0 *Manag. Sci. Lett.* **9** 1875–1886.
- [43] R. Diani, H. Herliantari, I. Irwandani, A. Saregar, and R. Umam 2019 The Effectiveness of SSCS Learning Model: Its Impact on the Students' Creative Problem-Solving Ability on the Concept of Substance Pressure *J. Penelit. Fis. dan Apl.* **9** 1.
- [44] S. Suhardiman, T. Tayeb, and N. Qadri 2017 Perbandingan Pemahaman Konsep Menggunakan Metode Pembelajaran Scramble Antara Media Interaktif CourseLab dan Media Microsoft PowerPoint Peserta Didik Kelas XI MIA MAN Wajo Kabupaten Wajo *J. Pendidik. Fis.* **5** 2 99–105.
- [45] R. Diani *et al.* 2019 Physics Learning through Active Learning Based Interactive Conceptual Instructions (ALBICI) to Improve Critical Thinking Ability *J. Penelit. dan Pembelajaran IPA* **5** 1 48.
- [46] S. Hartinah *et al.* 2019 Teacher's performance management: The role of principal's leadership, work environment and motivation in Tegal City, Indonesia *Manag. Sci. Lett.* **9** 14 1–12.
- [47] F. Lestari, B. Saryantono, M. Syazali, A. Saregar, D. Jauhariyah, and R. Umam 2019 Cooperative Learning Application with the Method of Network Tree Concept Map : Based on Japanese Learning System Approach *J. Educ. Gift. Young Sci.* **7** 1 15–32.
- [48] U. Farida, F. Agustini, and H. Wakhyudin 2017 Efektivitas Model Pembelajaran Scramble Berbasis Kontekstual Terhadap Kemampuan Berpikir Kritis IPS Siswa Kelas III SD Negeri Kebondalem 01 Batang *J. Ilm. Sekol. Dasar* **1** 3.
- [49] R. Ramadhani, R. Umam, A. Abdurrahman, and M. Syazali 2019 The Effect Of Flipped-Problem Based Learning Model Integrated With LMS-Google Classroom For Senior High School Students *J. Educ. Gift. Young* **7** 2 137–158.
- [50] B. Habibi *et al.* 2019 Factor Determinants of Teacher Professionalism as Development of Student Learning Education at School of SMK PGRI in Tegal City, Indonesia *J. Gift. Educ. Creat.* **6** 2 125–134.
- [51] A. Suryana 2012 Kemampuan Berpikir Matematis Tingkat Lanjut (Advanced Mathematical Thinking) dalam Mata Kuliah Statistika Matematika 1 Yogyakarta UNY.
- [52] R. Sagala, R. Umam, A. Thahir, A. Saregar, and I. Wardani 2019 The Effectiveness of STEM-Based on Gender Differences: The Impact of Physics Concept Understanding *Eur. J. Educ. Res.* **8** 3 753–763.
- [53] M. Gusniwati 2015 Pengaruh Kecerdasan Emosional Dan Minat Belajar Terhadap Penguasaan Konsep Matematika Siswa Sman Di Kecamatan Kebon Jeruk *Form. J. Ilm. Pendidik. MIPA* **5** 1.
- [54] S. Suraji, M. Maimunah, and S. Saragih 2018 Analisis Kemampuan Pemahaman Konsep Matematis dan Kemampuan Pemecahan Masalah Matematis Siswa SMP pada Materi Sistem Persamaan Linear Dua Variabel (SPLDV) *Suska J. Math. Educ.* **4** 1 9–16.